Does Liquidity Management Induce Fragility in Treasury Prices? Evidence from Bond Mutual Funds

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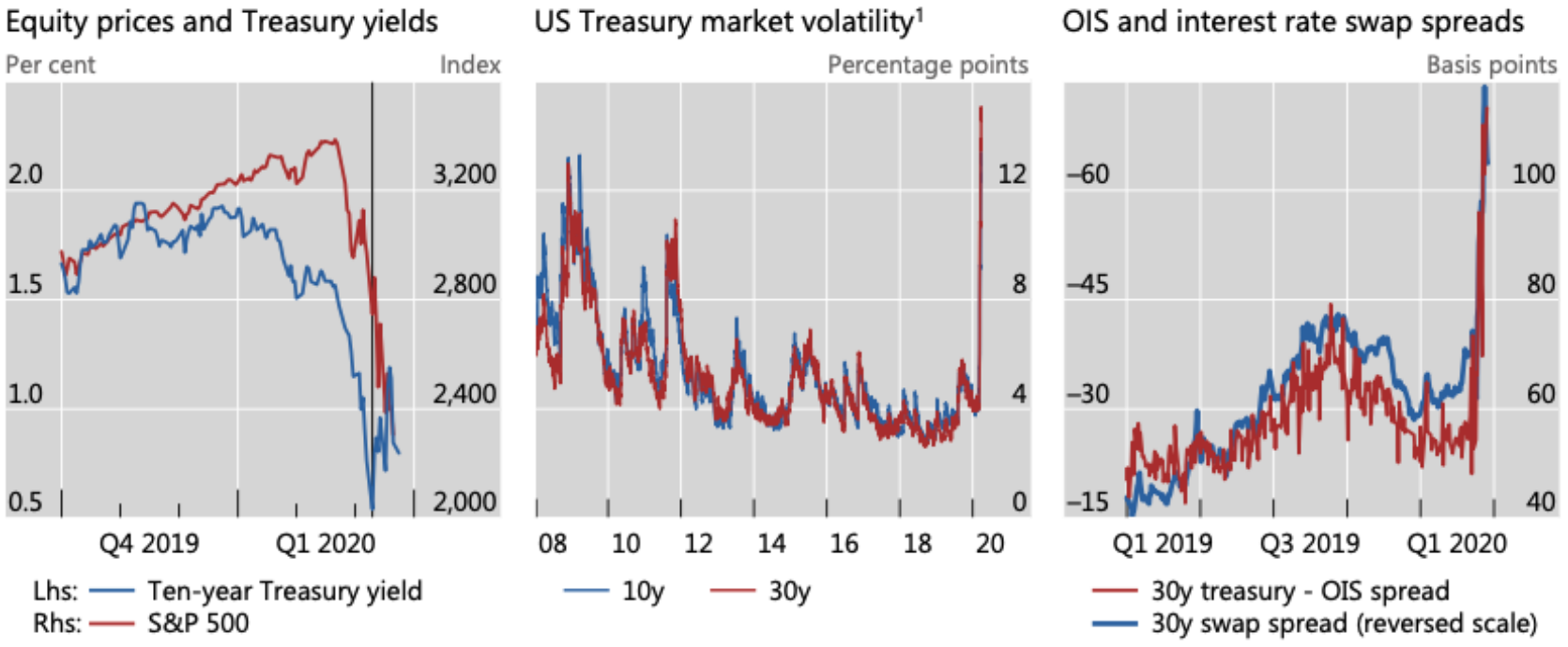
Motivation

- Global investors view the U.S. Treasury market as the safe haven
- until the COVID-19 pandemic

Covid-19 market rout and dislocations in the US Treasury market — Graph 1



The vertical line in the left-hand panel indicates 9 March 2020.

Schrimpf, Shin, and Sushko 2020

Motivation

- Increased fragility in the recent Treasury market.

  'Spikes in volatility and sudden declines in liquidity have become more frequent in both Treasury and equity markets. There is also evidence that liquidity shifts more rapidly and hence is less predictable in these markets.' Jerome Powell (2016)

- Economic mechanism is not clear yet.

Our Explanation

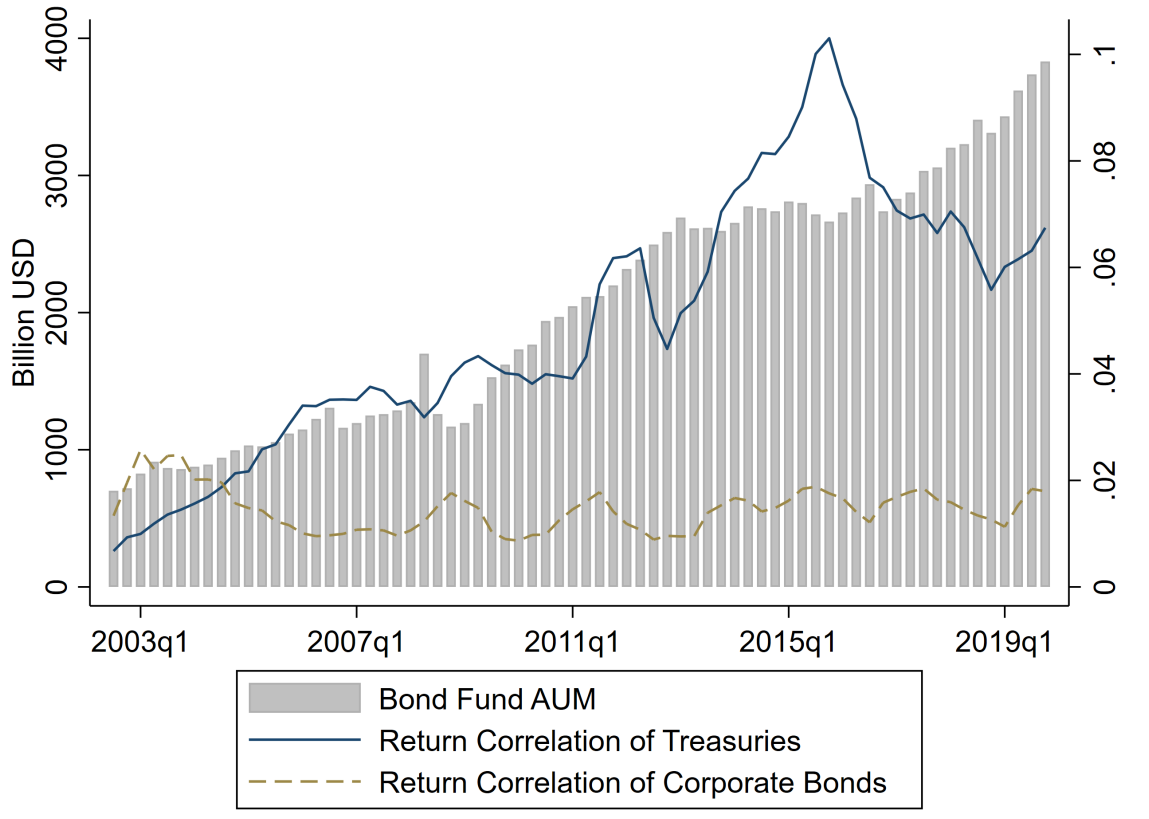
- The rise of open-end mutual funds holding illiquid assets
  - Perform liquidity transformation
  - The strategic complementarity among investors generates fragility (e.g., Chen, Goldstein, & Jiang 2010)
- Using Treasuries to manage liquidity
  - Hold Treasuries or other cash-like assets to buffer flow shocks
  - Trading-to-flow sensitivity increases for Treasuries, but decrease for corporate bond positions (e.g., Choi et al, 2020; Jiang, Li & Wang 2020)
  - Particularly so for outflows
  - Funds spillover the flow shocks to treasury market
- Total AUM of mutual funds investing illiquid assets grew from 1.3 in 2002 to 7.3 trillion USD in 2019
  - The share of marketable Treasury securities held by long-term mutual funds increased from 3% in 2008 to 8% in 2019, more than the amount held by banks and broker-dealers (Nellie Liang 2020)

This Paper: Asset Pricing Implications

- Liquidity management can exacerbate flow-induced price pressure on Treasuries and lead to fragility.
  - Risk-adjusted return: residuals from regressing bond returns onto a factor model
  - Flow-induced trading generates contemporaneous price pressure which reverts back in two months (nonfundamental)
  - Effect is more pronounced when funds experience outflows
  - Testable implications:
    - ⋆ Price comovement (the degree of total return variation and contagion)
    - ⋆ Down-market minus up-market price comovement: the asymmetric pattern due to outflows
    - ⋆ Commonality in illiquidity; Skewness; Volatility
- Weaker for corporate bond prices
- Sample: U.S. open-end bond mutual funds
  - With their holding data on Treasuries and corporate bonds
  - Natural experiments: 2003 mutual fund scandal
  - Implication: COVID-19

Trends

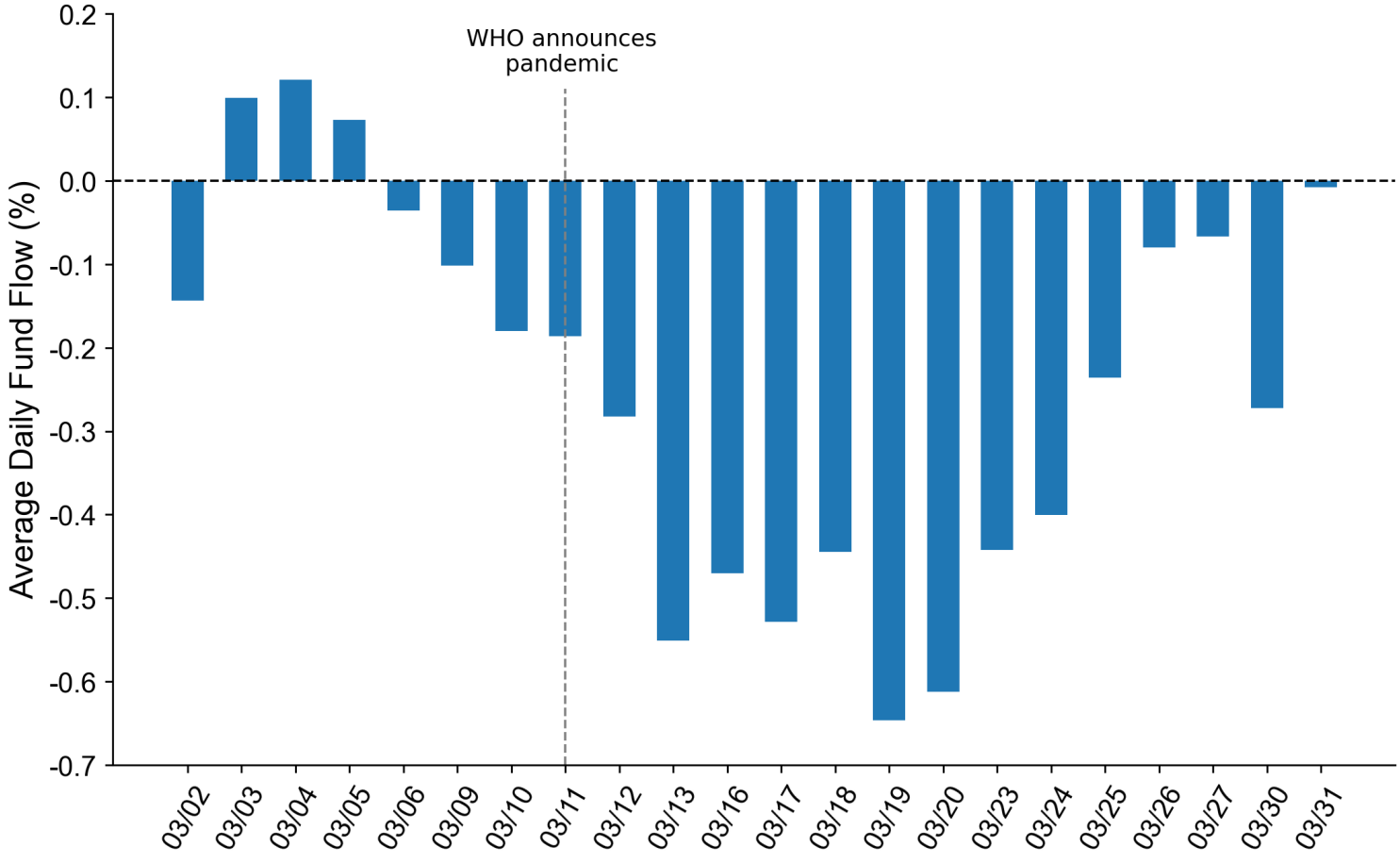
- The average excess return comovement among Treasuries increases from 1% to 7% between 2002 to 2019



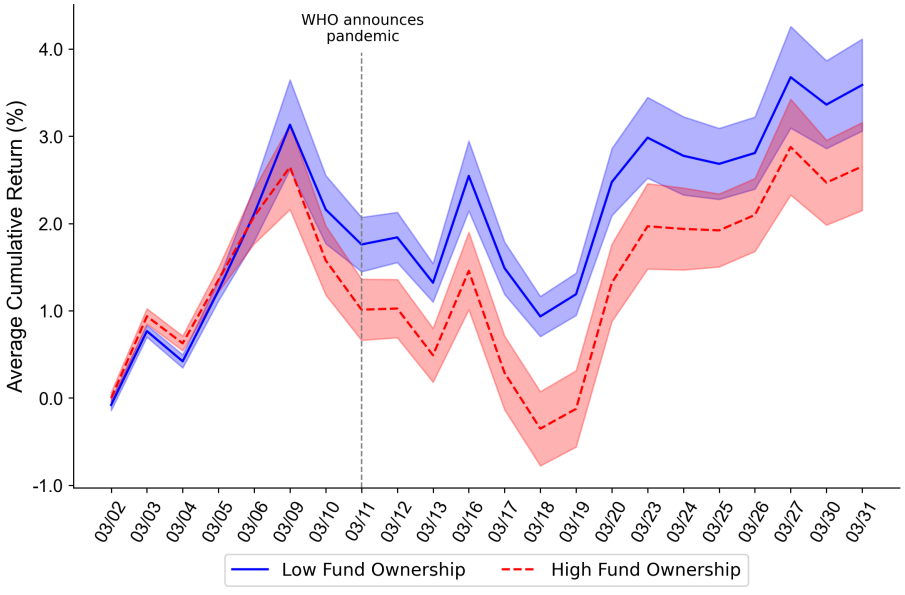
- Echoes the regulators concerns on fragility in Treasuries

What Happened in March, 2020: Fund Flow

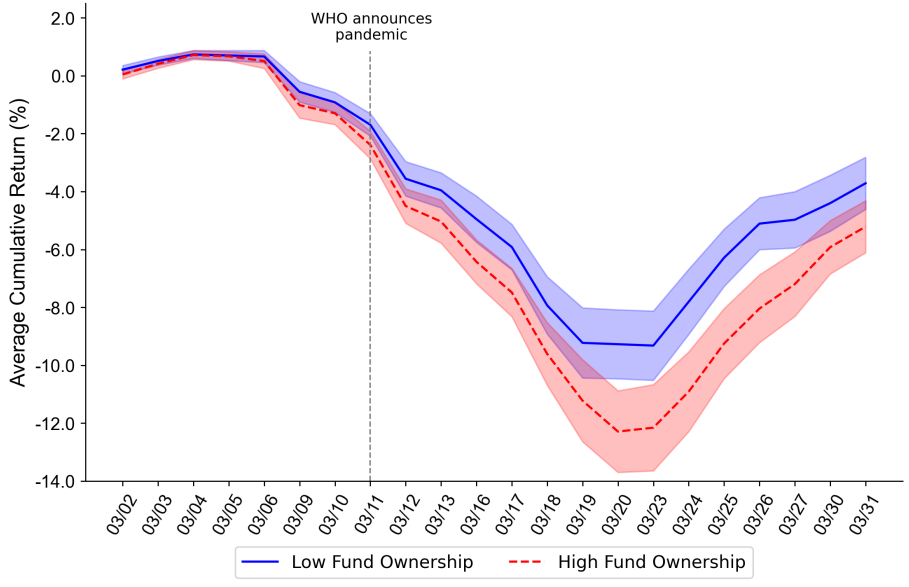
- Totally 5% AUM flow out of bond funds between 03/11 to 03/31



What Happened in March, 2020: Bond Prices



Treasuries



Corporate bonds

- Bond funds experiencing large outflows incline to liquidate treasuries
- Both long-term and short term evidences suggest that bond funds can contributes to treasury fragility

Risk-adjusted Bond Return

- Daily bond return

$$Bond\ Ret_{i,t} = \frac{P_{i,t} + AI_{i,t} + C_{i,t}}{P_{i,t-1} + AI_{i,t-1}} - 1.$$

- Adjusted bond return

$$Bond\ Ret - RF_{it} = \alpha_{it} + \sum_{s=0}^{2} \beta_{it-s} TRY_{t-s} + \sum_{s=0}^{2} \gamma_{it-s} IG_{t-s} + \sum_{s=0}^{2} \theta_{it-s} HY_{t-s} + \varepsilon_{it}$$

  - TRY: average daily returns of treasury securities
  - IG: Barclays corporate bond market index LUACTRUU (investment-grade)
  - HY: Barclays corporate bond market index LF98TRUU (junk bond)
  - We include two lags for each factor to take into account of non-synchronized trading.
  - Additional factors for robustness: *VIX*, *TERM*, and *DEF*.

Liquidity Management: Trading-to-Flow Sensitivity

$$NetBuy_{f,q} = \frac{\sum_i^N Share_{i,f,q} P_{i,q-1} - \sum_i^N Share_{i,f,q-1} P_{i,q-1}}{\sum_i^N Share_{i,f,q-1} P_{i,q-1}}$$

$$Fund\ Flow_{f,q} = \frac{TNA_{f,q} - TNA_{f,q-1}(1 + Fund\ Return_{f,q})}{TNA_{f,q-1}}$$

$$NetBuy_{f,q} = \alpha + \beta_1 \cdot Fund\ Flow_{f,q} + \beta_2 \cdot Fund\ Flow_{f,q-1} + \gamma_1 \cdot Fund\ Return_{f,q} + \gamma_2 \cdot Fund\ Return_{f,q-1} + \phi_f + \delta_q + \varepsilon_{f,q}$$

- $\beta_1 > 1$ for Treasuries, $\beta_1 < 1$ for corporate bonds
- $Out_{f,q}$: A dummy variable that equals one if $Flow_{f,q}$ is negative, and zero otherwise

Result: Liquidity Management

DepVar:	$Net\ Buy_{f,q}$							
	Treasuries				Corporate Bonds			
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
$Fund\ Flow_{f,q}$	1.382***	1.417***	1.197***	1.249***	0.864***	0.859***	0.882***	0.876***
	(23.5)	(22.5)	(15.5)	(15.6)	(23.9)	(23.3)	(16.0)	(16.0)
$Fund\ Flow_{f,q} \times Out_{f,q}$			0.564***	0.509***			-0.055	-0.052
			(4.2)	(4.0)			(-0.7)	(-0.7)
$Fund\ Flow_{f,q-1}$	-0.302***	-0.259***	-0.226***	-0.164***	0.214***	0.206***	0.225***	0.212***
	(-6.3)	(-5.8)	(-3.7)	(-3.2)	(7.2)	(7.0)	(5.4)	(5.1)
$Fund\ Flow_{f,q-1} \times Out_{f,q-1}$			-0.234*	-0.313***			-0.044	-0.025
			(-2.0)	(-3.1)			(-0.5)	(-0.3)
$Fund\ Return_{f,q}$	-0.760***	-0.585*	-0.789***	-0.608**	-0.001	-0.185	0.003	-0.183
	(-3.2)	(-2.0)	(-3.3)	(-2.1)	(-0.0)	(-0.8)	(0.0)	(-0.8)
$Fund\ Return_{f,q-1}$	0.163	0.326	0.145	0.317	-0.552***	-0.693***	-0.547***	-0.689***
	(0.6)	(1.0)	(0.5)	(1.0)	(-3.3)	(-3.9)	(-3.2)	(-3.8)
Fund Fixed Effects	No	Yes	No	Yes	No	Yes	No	Yes
Quarter Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
# of Obs	34,008	34,008	34,008	34,008	34,008	34,008	34,008	34,008
Adj R^2	0.070	0.190	0.071	0.191	0.097	0.159	0.097	0.159

- 1% inflow $\rightarrow$ a 1.25% (0.88%) increase in Treasury (corporate bond) holdings
- 1% outflow $\rightarrow$ a 1.76% (0.82%) decrease in Treasury (corporate bond) holdings

Flow-induced Trading Impact on Treasury Prices

- Following Lou (2012): purchase or sell driven by fund flows

$$FIT_{i,t} = \frac{\sum_i^F Share_{i,f,q-1} * Fund\ Flow_{f,t}}{\sum_i^F Share_{i,f,q-1}}$$

- The asymmetric impact between inflows and outflows:
  - *FIT_Positive*: *FIT* computed from funds with positive flows
  - *FIT_Negative*: *FIT* computed from funds with negative flows
- Fama-MacBeth (1973) regressions:

$$Return_{i,t} = \alpha + \beta \cdot FIT_{i,t} + \theta \cdot X_{i,t} + \varepsilon_{i,t}$$

  - $X_{i,j,q-1}$: *On-the-run*, *Coupon*, and *Time-to-maturity*

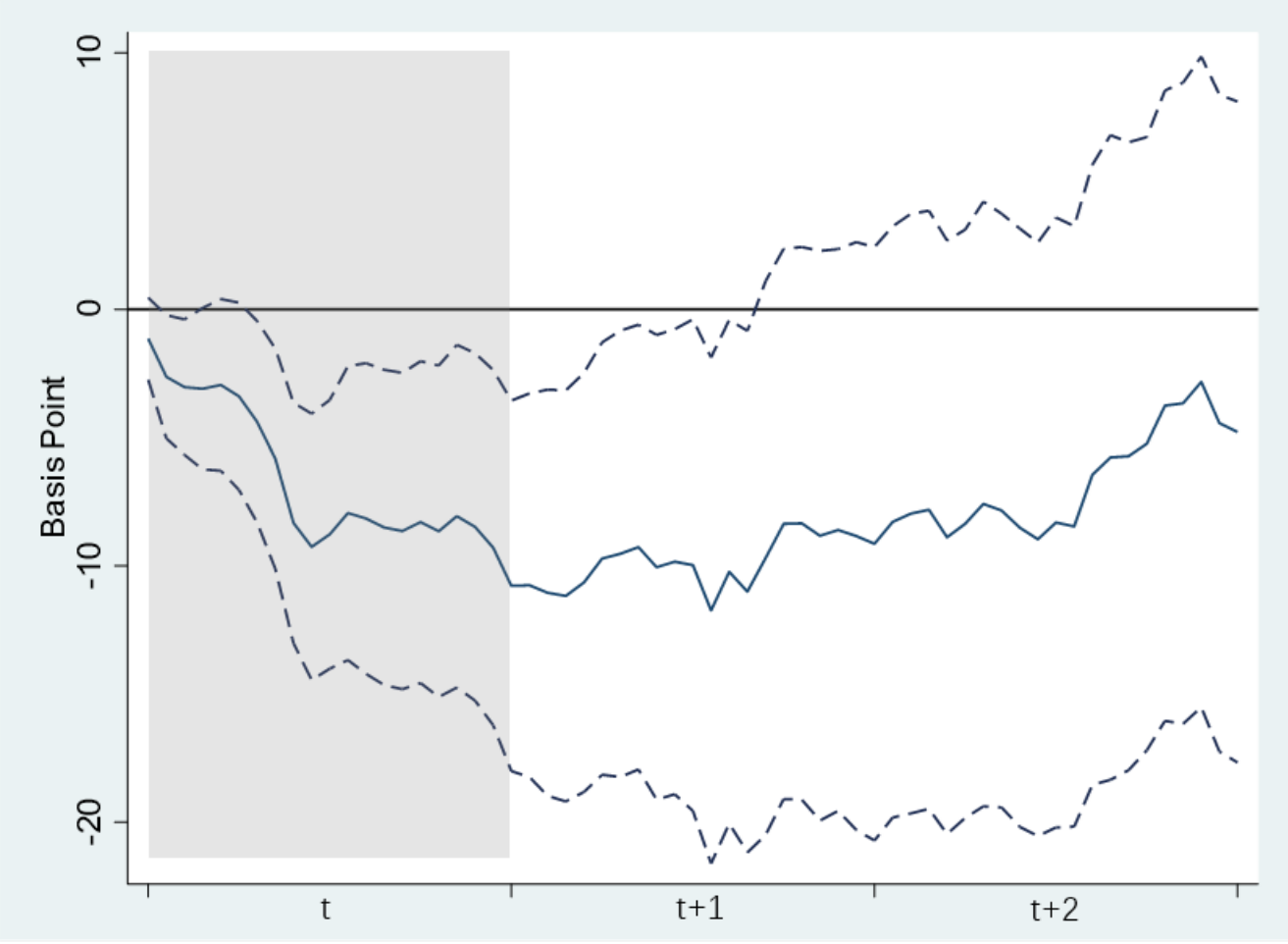
Flow-induced Trading Impact on Treasury Prices

$$Return_{i,t} = \alpha + \beta \cdot FIT_{i,t} + \theta \cdot X_{i,t} + \varepsilon_{i,t}$$

DepVar:	Risk-adjusted Return		Excess Return	
	(1)	(2)	(3)	(4)
FIT	4.801***		2.833***	
	(3.9)		(3.0)	
FIT_Pos		3.618**		0.955
		(2.3)		(0.8)
FIT_Neg		7.755***		6.544***
		(3.0)		(3.5)
On-the-run			3.717	3.904
			(1.5)	(1.6)
Coupon Rate			21.307***	20.987***
			(9.1)	(9.0)
Time-to-maturity			12.247	12.410*
			(1.6)	(1.7)
# of Obs	57,521	57,521	57,521	57,521

- A one SD increase in *FIT* is associated with a 4.8 bp increase in the risk-adjusted return in the contemporaneous month.
- The price impact is about two times stronger for outflows than for inflows.

Flow-induced Trading Impact on Treasury Prices



- Cumulative return spread between a portfolio with negative FIT and a portfolio with positive FIT, where $t = 0$ is the end of the formation month.
- Overshooting in treasury prices is largely due to non-fundamental shocks

Common Ownership and Return Comovement

- Common ownership (Anton and Polk, 2014) for each Treasury pair, i and j, at quarter q, (standardized)

$$\textit{Common Ownership}_{i,j,q} = \frac{\sum_{f=1}^{F}(\textit{Shares}_{i,f,q} \times P_{i,q} + \textit{Shares}_{j,f,q} \times P_{j,q})}{\textit{SharesOutstanding}_{i,q} \times P_{i,q} + \textit{SharesOutstanding}_{j,q} \times P_{j,q}}$$

- Fama-MacBeth (1973) regressions

$$\begin{aligned} \textit{Corr}_{i,j,q} = &\quad \alpha + \beta \cdot \textit{Common Ownership}_{i,j,q-1} + \theta \cdot X_{i,j,q-1} + \varepsilon_{i,j,q} \\ \textit{Down-minus-up}_{i,j,q} = &\quad \alpha + \beta \cdot \textit{Common Ownership}_{i,j,q-1} + \theta \cdot X_{i,j,q-1} + \varepsilon_{i,j,q} \end{aligned}$$

  - *Corr*: The pairwise return correlation of daily risk-adjusted returns
  - *Down-minus-up*: The difference in the pairwise return correlation between downside and upside markets
    - ★ Upside (downside) markets: daily aggregate Treasury market return above (below) quarter median
    - ★ Advantages: (1) "crash contagion" (2) mitigate endogeneity

Result: Common Ownership and Return Comovement

$$Corr_{i,j,q} = \alpha + \beta \cdot Common\ Ownership_{i,j,q-1} + \theta \cdot X_{i,j,q-1} + \varepsilon_{i,j,q}$$

Panel A: Treasury			Panel B: Corporate Bonds		
DepVar:	Corr		DepVar:	Corr	
	(1)	(2)		(3)	(4)
Common Onwership	0.103***	0.079***	*Common Ownership*	0.007***	0.005***
	(36.8)	(19.8)		(9.9)	(9.1)
On-the-run Difference		0.016***	*Liquidity Difference*		-0.004***
		(4.3)			(-13.4)
Coupon Rate Difference		-0.056***	*Coupon Rate Difference*		-0.002***
		(-20.7)			(-4.3)
Time-to-maturity Difference		-0.176***	*Rating Difference*		-0.003***
		(-21.6)			(-7.5)
			Time-to-maturity Difference		-0.003***
					(-7.3)
# of Obs	2,185,735	2,185,735	# of Obs	11,528,871	11,528,871

- A one SD increase in *Common Ownership* is associated with a 7.9% increase in the return correlation between two Treasuries (sample mean = 6.2%)
- A one SD increase in *Common Ownership* is associated with a 0.5% increase in the return correlation between two corporate bonds (sample mean = 1.4%)

Result: Upside vs. Downside Markets

$$\textit{Down-minus-up}_{i,j,q} = \alpha + \beta \cdot \textit{Common Ownership}_{i,j,q-1} + \theta \cdot X_{i,j,q-1} + \varepsilon_{i,j,q}$$

Panel A: Treasury			Panel B: Corporate Bonds		
DepVar:	Down-minus-up		DepVar:	Down-minus-up	
	(1)	(2)		(3)	(4)
Common Onwership	0.011***	0.008***	*Common Ownership*	0.0005	0.0004
	(5.3)	(2.9)		(1.3)	(1.3)
On-the-run Difference		-0.012***	*Liquidity Difference*		-0.0000
		(-5.2)			(-0.1)
Coupon Rate Difference		0.008	*Coupon Rate Difference*		0.0000
		(1.5)			(0.0)
Time-to-maturity Difference		-0.065***	*Rating Difference*		-0.0004
		(-7.5)			(-1.1)
			Time-to-maturity Difference		0.0006
					(1.2)
# of Obs	2,185,735	2,185,735	# of Obs	11,528,871	11,528,871

- A one standard deviation increase in *Common Ownership* is associated with a 0.8% increase *Down-minus-up* (sample mean = 0.3%)
- Bond funds use treasury securities instead of corporate bonds as flow buffer in liquidity management

Natural Experiment: 2003 Mutual Fund Scandal

- Regulatory inquiry in September 2003 resulted in litigation in which 25 mutual fund families were implicated in illegal trading practices
- The natural experiment
  - The scandal had a negative impact on affected funds' flows from 2003Q4 to 2006Q4 (McCabe, 2009; Anton and Polk, 2014; Koch, Ruenzi, and Starks, 2016)
  - It was unlikely to be related to the characteristics of bonds
  - Treasuries owned by scandal funds experienced a significant reduction in ownership during the scandal period, which is exogenous
- Following Koch, Ruenzi, and Starks (2016), a difference-in-differences regression:

$$\begin{aligned} \textit{Down-minus-up}_{i,j,q} =& \alpha + \beta \cdot \textit{Treat}_{i,j} \times \textit{Event}_q + \theta_1 \cdot \textit{Treat}_{i,j} \\ &+ \theta_2 \cdot X_{i,j,q-1} + \textit{year-quarter dummies} + \varepsilon_{i,j,q}, \end{aligned} \tag{1}$$

Natural Experiment: 2003 Mutual Fund Scandal

DepVar:	Down-minus-up			
	(1)	(2)	(3)	(4)
Treat × *Event*	-0.005*	-0.005*	-0.005**	-0.007***
	(-1.8)	(-1.8)	(-2.0)	(-2.6)
Treat	0.005**	0.005**	0.003	-0.002
	(2.3)	(2.4)	(1.5)	(-0.8)
On-the-run Difference		-0.012***	-0.012***	-0.006
		(-3.7)	(-3.6)	(-0.8)
Coupon Rate Difference			-0.007***	-0.007***
			(-11.4)	(-11.9)
Time-to-maturity Difference				-0.051***
				(-89.6)
# of Obs	128,818	128,818	128,818	128,818

Treasury market turmoil during COVID-19

$$Corr_{i,j,m} = \alpha + \beta \cdot Treat_{i,j} \times After_m + \theta_1 \cdot Treat_{i,j} + \theta_2 \cdot After_m + \theta_3 \cdot X_{i,j} + \varepsilon_{i,j,m}$$

- $Treat_{i,j} = 1$ if the security pair i and j has common ownership (at the end of 2019) above the median, and zero otherwise.
- $After_m = 1$ if $Corr_{i,j,m}$ is computed on and after March 11, 2020, zero otherwise.

DepVar:	Corr			
	Treasuries		Corporate Bonds	
	(1)	(2)	(3)	(4)
Treat × *After*	0.042***	0.042***	0.009***	0.009***
	(7.2)	(10.7)	(2.6)	(2.6)
Treat	0.210***	0.134***	0.017***	0.010***
	(47.6)	(48.0)	(8.8)	(4.7)
After	0.015***	0.015***	-0.009***	-0.009***
	(4.0)	(5.7)	(-3.5)	(-3.5)
Controls	No	Yes	No	Yes
# of Obs	97,006	97,006	126,186	126,186
Adj R^2	0.063	0.567	0.001	0.003

Liquidity Commonality among Treasuries

- Recent studies document a deterioration in the liquidity conditions in the treasury market
  - Schrimpf, Shin, and Sushko (2020), Fleming and Ruela (2020)
  - Liquidity dry-up in Treasuries during the COVID-19 crisis
  - Another indicator for market fragility
- We use the sample spanning a long period (from 2002 to 2019) and conduct cross-sectional tests to study whether fund common ownership can generate liquidity commonality in Treasuries.
  - Liquidity dry-up event: days with bid-ask spreads exceeding the top quartile of bid-ask spreads in the previous four quarters.
  - *Common Dry-ups*: A dummy variable that equals one if these two Treasuries have experienced liquidity dry-ups in the same day.
  - For individual bonds, decreasing skewness: larger price crash likelihood

Liquidity Commonality among Treasuries

$$\textit{Common Dry-ups}_{i,j,q} = \alpha + \beta \cdot \textit{Common Ownership}_{i,j,q-1} + \theta \cdot X_{i,j,q-1} + \varepsilon_{i,j,q}$$

Panel A: Full Sample				
DepVar:	Common Dry-ups		Skewness	
	(1)	(2)	(3)	(4)
Common Ownership	0.025***	0.027***		
	(3.6)	(3.6)		
Ownership			-0.587***	-0.441***
			(-9.9)	(-10.9)
Controls	No	Yes	No	Yes
# of Obs	2,185,735	2,185,735	16,477	16,477
Panel B: Mutual Fund Scandal				
DepVar:	Common Dry-ups		Skewness	
	(1)	(2)	(3)	(4)
Treat × *Event*	-0.002***	-0.002***	0.238**	0.269**
	(-3.3)	(-3.2)	(2.0)	(2.2)
Treat	0.002***	0.002***	-0.184**	-0.260***
	(4.1)	(3.3)	(-2.0)	(-2.7)
Controls	No	Yes	No	Yes
# Obs	128,818	128,818	3,082	3,082

Conclusion

- Liquidity management contribute to the increasing fragility in the Treasury market
  - Non-fundamental-driven flow-induced trading generates contemporaneous price impacts and subsequent reversal.
  - Excess return comovement, especially during downside markets.
  - Liquidity commonalities
  - Skewness

- Our findings call for regulatory actions to stabilize the most liquid asset market
  - e.g., Liang (2020) advocates to match the liquidity of bond funds' assets to the liquidity that funds offer
  - Swing pricing, e.g., Jin, Kacperczyk, Kahraman, & Suntheim (2019)

Appendix

Outflow Funds versus Inflow Funds

DepVar:	Corr			
	Treasuries		Corporate Bonds	
	(1)	(2)	(3)	(4)
Common Ownership	0.075***	0.075***	0.004***	0.004***
	(10.5)	(10.6)	(4.5)	(4.6)
Common Ownership × *Ratio of Outflow*	0.039**	0.038**	-0.000	-0.000
	(2.3)	(2.3)	(-0.2)	(-0.0)
Ratio of Outflow	0.015	0.015	-0.002*	-0.002*
	(1.3)	(1.3)	(-1.7)	(-1.8)
Control	Yes	Yes	Yes	Yes
Control × *Ratio of Outflow*	No	Yes	No	Yes
# of Obs	1,836,161	1,836,161	5,820,845	5,820,845

- *Ratio of Outflow*: holding-weighted proportion of the security pair's common funds whose fund flow is negative.
- The effect of fund common ownership on Treasury return comovement is stronger when more funds experience redemption.

Illiquid funds vs. liquid funds

DepVar:	$Net\ Buy_{f,q}$			
	Illiquid Funds		Liquid Funds	
	Treasuries	Corporate Bonds	Treasuries	Corporate Bonds
	(1)	(2)	(3)	(4)
$Fund\ Flow_{f,q}$	1.205***	0.882***	1.345***	0.657***
	(11.4)	(14.0)	(14.5)	(11.1)
$Fund\ Flow_{f,q} \times Out_{f,q}$	0.885***	0.063	0.173	0.059
	(5.3)	(0.6)	(0.9)	(0.6)
$Fund\ Flow_{f,q-1}$	-0.248***	0.117***	-0.104	0.234***
	(-3.6)	(2.9)	(-1.6)	(4.7)
$Fund\ Flow_{f,q-1} \times Out_{f,q-1}$	-0.299*	0.023	-0.284**	-0.064
	(-1.9)	(0.2)	(-2.1)	(-0.7)
$Fund\ Return_{f,q}$	-0.545	-0.116	-0.178	-0.206
	(-1.3)	(-0.5)	(-0.3)	(-0.7)
$Fund\ Return_{f,q-1}$	-0.212	-0.461***	0.817	-0.929***
	(-0.6)	(-2.8)	(1.2)	(-4.0)
Fund Fixed effects	Yes	Yes	Yes	Yes
Quarter Fixed Effects	Yes	Yes	Yes	Yes
# of Obs	15,695	15,695	17,829	17,829
Adj R^2	0.199	0.222	0.236	0.170

Number of unique securities

Panel A: Treasuries				
DepVar:	Corr		Down-minus-up	
	(1)	(2)	(3)	(4)
Common Onwership (more TRY)	0.082***	0.067***	0.006***	0.004**
	(24.8)	(21.2)	(3.2)	(2.0)
Common Onwership (less TRY)	0.008***	0.004***	0.001**	0.000
	(6.6)	(4.7)	(2.0)	(0.8)
On-the-run Difference		0.017***		-0.012***
		(4.5)		(-5.2)
Coupon Rate Difference		-0.055***		0.008
		(-20.4)		(1.5)
Time-to-maturity Difference		-0.176***		-0.065***
		(-21.7)		(-7.5)
# of Obs	2,185,735	2,185,735	2,185,735	2,185,735
Panel B: Corporate Bonds				
DepVar:	Corr		Down-minus-up	
	(1)	(2)	(3)	(4)
Common Ownership (more CB)	0.006***	0.004***	0.0004	0.0004
	(7.8)	(7.3)	(1.3)	(1.4)
Common Ownership (less CB)	0.001***	0.000***	0.0000	0.0000
	(4.4)	(3.9)	(0.2)	(0.2)
Liquidity Difference		-0.004***		-0.0000
		(-13.4)		(-0.1)
Coupon Rate Difference		-0.002***		-0.0000
		(-4.3)		(-0.0)
Rating Difference		-0.003***		-0.0005
		(-7.7)		(-1.2)
Time-to-maturity Difference		-0.004***		0.0006
		(-7.4)		(1.2)
# of Obs	11,528,871	11,528,871	11,528,871	11,528,871

During COVID-19

Panel A: Treasuries						
DepVar:	Corr				After-minus-before	
Timing:	Before March 11		After March 11			
	(1)	(2)	(3)	(4)	(5)	(6)
Common Onwership	0.150***	0.086***	0.178***	0.149***	0.028***	0.062***
	(76.5)	(60.9)	(97.4)	(97.5)	(16.7)	(37.2)
On-the-run Difference		0.060***		0.051***		-0.009
		(8.7)		(7.3)		(-1.1)
Coupon Rate Difference		-0.054***		0.031***		0.086***
		(-33.0)		(23.9)		(47.0)
Time-to-maturity Difference		-0.378***		-0.278***		0.100***
		(-292.6)		(-198.1)		(66.5)
# of Obs	48,503	48,503	48,503	48,503	48,503	48,503
Adj R^2	0.082	0.665	0.148	0.548	0.005	0.127

Panel B: Corporate Bonds						
DepVar:	Corr				After-minus-before	
Timing:	Before March 11		After March 11			
	(1)	(2)	(3)	(4)	(5)	(6)
Common Ownership	0.010***	0.006***	0.018***	0.013***	0.008***	0.007***
	(9.5)	(5.6)	(11.3)	(8.0)	(5.2)	(4.5)
Liquidity Difference		-0.007***		-0.001		0.005***
		(-6.7)		(-0.8)		(3.7)
Coupon Rate Difference		-0.003***		-0.003**		-0.000
		(-3.0)		(-2.2)		(-0.3)
Rating Difference		-0.004***		-0.008***		-0.004**
		(-4.0)		(-5.2)		(-2.6)
Time-to-maturity Difference		-0.008***		-0.007***		0.001
		(-7.1)		(-4.0)		(0.3)
# of Obs	63,093	63,093	63,093	63,093	63,093	63,093
Adj R^2	0.001	0.003	0.002	0.003	0.000	0.001

Month beginning vs. Month end

Panel A: Treasuries						
DepVar:	Corr				End-minus-beginning	
Timing:	Month end		Month beginning			
	(1)	(2)	(3)	(4)	(5)	(6)
Common Onwership	0.117***	0.089***	0.100***	0.080***	0.016***	0.010***
	(26.9)	(17.5)	(31.2)	(18.1)	(4.4)	(3.0)
On-the-run Difference		0.021***		-0.000		0.021***
		(4.2)		(-0.0)		(5.3)
Coupon Rate Difference		-0.064***		-0.041***		-0.023***
		(-16.4)		(-8.8)		(-5.8)
Time-to-maturity Difference		-0.213***		-0.176***		-0.037***
		(-18.5)		(-19.7)		(-3.3)
# of Obs	2,185,735	2,185,735	2,185,735	2,185,735	2,185,735	2,185,735
Panel B: Corporate Bonds						
DepVar:	Corr				End-minus-beginning	
Timing:	Month end		Month beginning			
	(1)	(2)	(3)	(4)	(5)	(6)
Common Ownership	0.008***	0.006***	0.009***	0.007***	-0.001	-0.001
	(9.5)	(8.6)	(8.3)	(8.3)	(-1.6)	(-1.3)
Liquidity Difference		-0.004***		-0.005***		0.001
		(-10.1)		(-9.0)		(0.9)
Coupon Rate Difference		-0.001***		-0.002***		0.001
		(-3.9)		(-4.0)		(1.4)
Rating Difference		-0.004***		-0.003***		-0.000
		(-8.0)		(-6.1)		(-1.0)
Time-to-maturity Difference		-0.004***		-0.005***		0.001
		(-5.2)		(-4.8)		(0.8)
# of Obs	11,528,871	11,528,871	11,528,871	11,528,871	11,528,871	11,528,871