Monetary Policy and Fragility in Corporate Bond Mutual Funds

John Kuong, James O'Donovan, and Jinyuan Zhang

INSEAD&CEPR, City U of Hong Kong, and UCLA Anderson

4th Conference on Non-Bank Financial Sector and Financial Stability
and 16th Paul Woolley Centre Conference
June 6, 2024, London

Outline

Introduction

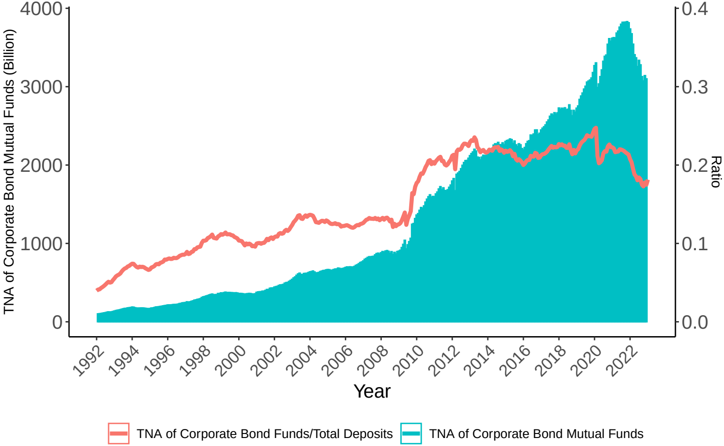
Evidence for the outflow-ΔFFTar relationship

A Model of Monetary-policy-induced fragility

Factors that affect MP-induced fragility

Conclusion

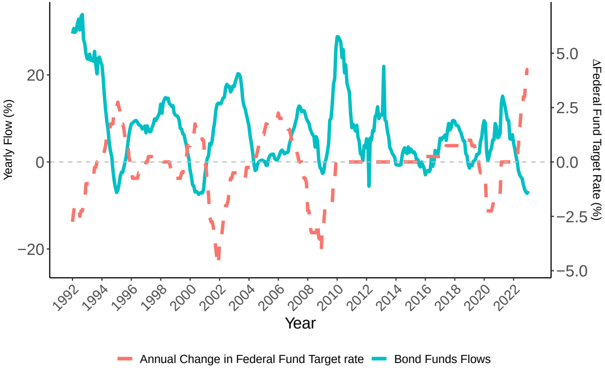
Motivation: Corporate bond mutual funds are important



As of 2022, size of corporate bond mutual funds $\simeq$ 20% of deposits

- Corporate bond ETF $\simeq$ \$340 bns as of 2021 (Koont et al., 2022)

Motivation: Bond fund flows are sensitive to policy rate changes



- 25 b.p. annual increase in Target Fed Fund rate (FFTar) is associated with 1.55% of Total Net Asset (TNA) worth of additional annual outflows
- Deposit outflow = 0.47%

Motivation: Bond funds can be fragile

Like banks, bond funds engage in liquidity provision to investors.

- They issue demandable (equity) claims; hold illiquid bonds

Strategic withdrawal harms liquidity provision

- Investors redeem at current net-asset-values (NAV)
- Mispricing and liquidation costs are borne by staying investors
- $\implies$ first-mover advantage $\implies$ runs or fragility in funds
- Regulators are concerned: SEC's redemption fee proposal

Existing research: bad fund performance as a trigger of outflows

- Goldstein, Jiang, and Ng (2017) and the subsequent literature
- Mostly individual fund-level outflow.
- Few study mispricing (except for Choi, Kronlund, and Oh (2022))

This paper: Monetary Policy (MP) as a systematic trigger of fund runs

- Document outflow-ΔFederal Fund Target rate (FFTar) relationship.
  - Ingredients: predictable ΔFFTar + Staleness in NAV $\Longrightarrow$
  - mispriced NAV days before FOMC meetings $\rightarrow$ strategic inflows or outflows
  - Stronger outflow response (than inflow) $\rightarrow$ fragility
- Model the MP-induced fragility driven by both stale-pricing and transaction costs (illiquidity).
- Uncover factors that drive fragility and provide evidence.
  1. More fragility when liquidity is low
  2. Staleness can reduce fragility when liquidity is low
  3. More fragility in tight MP environment when liquidity is low

Relevance: Broad and novel macro-financial stability implications

Literature and Contributions

- **Fund Runs:** Chen, Goldstein, and Jiang (2010), Goldstein, Jiang, and Ng (2017), Choi, Kronlund, and Oh (2022)
  - New theory and evidence on how monetary policies agg. trigger fund flow. Staleness is key and can be stabilizing.
- **Fund flows and monetary policy:** Feroli et al. (2014), Banegas, Montes-Rojas, and Siga (2016), Fang (2022)
  - New mechanism, supported with event studies using daily data.
- **Destabilizing effects of monetary policy:** Adrian and Shin (2008), Drechsler, Savov, and Schnabl (2018), Di Maggio and Kacperczyk (2017), Choi and Kronlund (2017) and Ivashina and Becker (2015)
  - New unintended consequence, in both tight and loose MP environment.

Outline

Introduction

Evidence for the outflow-ΔFFTar relationship

A Model of Monetary-policy-induced fragility

Factors that affect MP-induced fragility

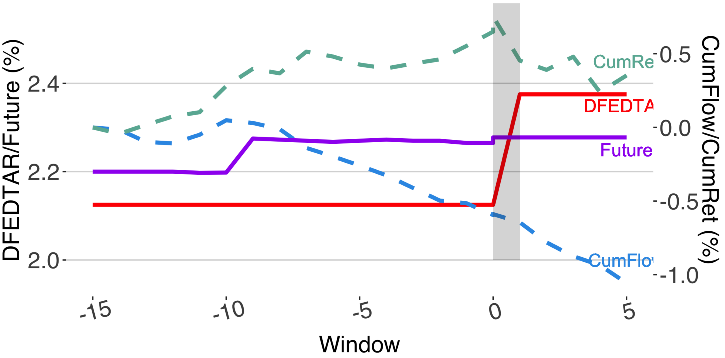
Conclusion

Data

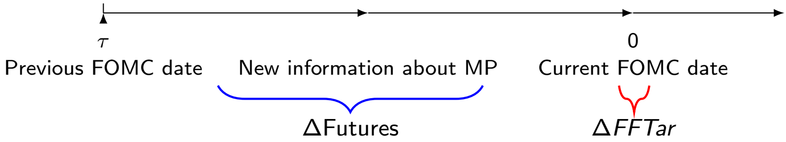
- Daily evidence (Jan 2009 to June 2023)
  - daily flows from Morningstar Direct
- Monthly evidence (Jan 1991 to June 2023)
  - CRSP survivor-bias-free US mutual fund Database
- Target Federal funds rate (Federal reserved bank of St. Louis)
- 30-day Federal fund futures, 30-day EuroDollar rate from Bloomberg
- $\text{OutFlow}_{i,t}(\text{in }\%) = -\frac{TNA_{i,t} - TNA_{i,t-\mathbf{1}} * (1 + R_{i,t})}{TNA_{i,t-\mathbf{1}}}$

An illustration of Our Mechanism

Figure: FOMC on December 18-19, 2018



Premise 1: Future interest rate changes are predictable

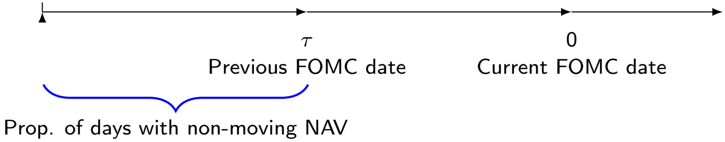


	$\Delta FFTar_{[-1,1]}$			
	Year$\geq$ 1991		Year$\geq$ 2009	
	(1)	(2)	(3)	(4)
ΔFFuture$_{(\tau+5,-1]}$	0.643***		0.501***	
	(0.056)		(0.065)	
ΔEuroDollar$_{(\tau+5,-1]}$		0.687***		0.886***
		(0.053)		(0.076)
Constant	0.003	-0.003	0.018	0.014
	(0.011)	(0.010)	(0.015)	(0.012)
Observations	281	281	125	125
Adjusted R^2	0.320	0.372	0.323	0.521

Premise 2: Bond funds NAV is stale

Reason: Corp. bond traded once per week. (median 4.45 days)

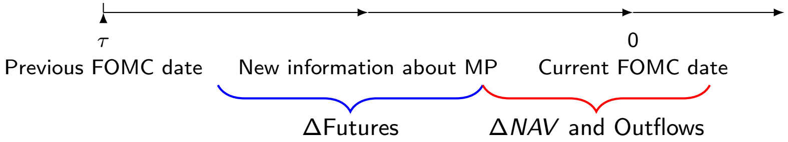
- Staleness proxy



- Sample median is 31%
- For each meeting, high staleness funds = higher than median

Characteristics

Premise 3: Stale NAV responds slowly to market information



- For stale-NAV funds, ΔFutures predict future ΔNAV
- When NAV is expected to drop, investors have incentive to redeem preemptively

Premise 3: Stale NAV responds slowly to market information

and continues to adjust after the FOMC meeting.

High-Staleness Corporate Bond Funds

	$\Delta NAV_{i,(\tau+5,-5]}$	$\Delta NAV_{i,(-5,-1]}$	$\Delta NAV_{i,(-1,5]}$	$\Delta NAV_{i,(5,15]}$
	(1)	(2)	(3)	(4)
$\Delta Eurodollar_{(\tau+5,-5]}$	-1.683^{***}	-0.687^{**}		
	(0.591)	(0.296)		
$\Delta Eurodollar_{(\tau+5,-1]}$			-0.741^{***}	
			(0.213)	
$\Delta Eurodollar_{(\tau+5,5]}$				0.137
				(0.290)
$Controls^F_{i,t-1}$	✓	✓	✓	✓
Fund FE	✓	✓	✓	✓
Observations	69,796	69,792	72,067	70,937

Low-Staleness Corporate Bond Funds

	$\Delta NAV_{i,(\tau+5,-5]}$	$\Delta NAV_{i,(-5,-1]}$	$\Delta NAV_{i,(-1,5]}$	$\Delta NAV_{i,(5,15]}$
	(1)	(2)	(3)	(4)
$\Delta Eurodollar_{(\tau+5,-5]}$	-3.744^{**}	-0.912		
	(1.490)	(0.559)		
$\Delta Eurodollar_{(\tau+5,-1]}$			-0.732	
			(0.508)	
$\Delta Eurodollar_{(\tau+5,5]}$				-0.467
				(0.365)
$Controls^F_{i,t-1}$	✓	✓	✓	✓
Fund FE	✓	✓	✓	✓
Observations	85,247	85,233	88,399	87,065

- Controls: changes in yield slope, the default spread, and the VIX index, and one-year lagged fund characteristics

Result: Flow Responses

	High-staleness Funds		
	$OutFlows_{i,(-5,-1]}$	$OutFlows_{i,(-1,-5]}$	$OutFlows_{i,(5,15]}$
	(1)	(2)	(3)
$\Delta Eurodollar_{(\tau+5,t]}$	0.862^{***}	1.018^{***}	0.766^{***}
	(0.135)	(0.359)	(0.211)
$Controls^F_{i,t-1}$	✓	✓	✓
Fund FE	✓	✓	✓
	Low-staleness Funds		
	(1)	(2)	(3)
$\Delta Eurodollar_{(\tau+5,t]}$	0.277^{***}	0.515^{***}	0.435^{***}
	(0.097)	(0.133)	(0.118)
$Controls^F_{i,t-1}$	✓	✓	✓
Fund FE	✓	✓	✓
	Difference of High versus Low funds		
	(1)	(2)	(3)
$\Delta Eurodollar_{(\tau+5,t]} \times \mathbb{1}(\text{High-Stale})$	0.585^{***}	0.503^{*}	0.331
	(0.142)	(0.289)	(0.226)

- Investors redeem funds to profit from stale NAV

Sizing up the effect

	Daily Evidence		Monthly Evidence
	$\text{OutFlows}_{i,(-5,-1]}$	$\text{OutFlows}_{i,(-5,5]}$	$OutFlow_{i,m}(\%)$
	(1)	(2)	(3)
$\widehat{\Delta\text{FFTar}_{[-1,1]}}$	0.654***	1.711***	
	(0.118)	(0.310)	
ΔFFTar_m			1.899***
			(0.547)
$\Delta\text{Controls}_m^M$	✓	✓	✓
$\text{Controls}_{i,t-1}^F$	✓	✓	✓
Fund FE	✓	✓	
Observations	179,953	180,124	240,453

- $\widehat{\Delta\text{FFTar}_{[-1,1]}}$ is predicted FFTar changes by $\Delta\text{Eurodollar}_{(\tau+5,-5]}$
- A 25 b.p. increase in $\widehat{\Delta\text{FFTar}}$ is associated with 0.16% (0.654×0.25) additional outflow in the week before FOMC.
  - 0.3% in Feb-Apr 2020 (Falato, Goldstein, and Hortaçsu, 2021)
- Outflow response in [-5,-1] $\simeq$ 34% (0.654/1.899) of monthly outflow response

Asymmetry effect when policy rate increases

- Monthly data from Jan 1992 to Jun 2023

Sample	$OutFlow_{i,m}$(%) in Months with FOMC meetings		
	All	ΔFFTar$_m \geq 0$	ΔFFTar$_m \leq 0$
	(1)	(2)	(3)
$\Delta FFTar_m$	0.742***	1.511***	0.212
	(0.246)	(0.421)	(0.377)
Fund FE	✓	✓	✓
Controls	✓	✓	✓
Observations	336,848	310,880	279,079

- Outflow-ΔFFTar relationship is stronger for FFTar increases

Complementary evidence

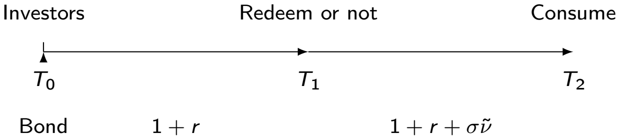
Treasury funds do not show MP-induced outflows

Robustness check for our mechanism (staleness in NAV).

- The effect is stronger in retail and non-index funds
- Not some general effect on fixed-income products or risk premium
- Not reaching for yield in the low-interest rate environment
- Beyond auto-correlation in returns (Choi, Kronlund, and Oh, 2022)

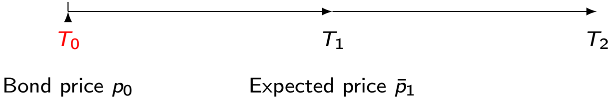
Outline

A Model of MP-induced Fund Runs: Setup



- A continuum of investors invested in a bond mutual fund. Each owns a share. All consume at T_2.
- A two-period risk-free bond, paying \$1 at T_2
- Monetary Policy shocks $\tilde{\nu}$:

Model Timeline (1/2)

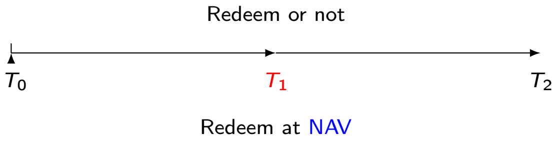


- T_0: The bond fund buys the bonds at price $p_0 = \frac{\bar{p}_1}{1+r}$ and

$$\bar{p}_1 = \mathbb{E}\left[\frac{1}{1 + r + \sigma\tilde{\nu}}\right]$$

is the expected, pre-shock, bond value at end of date 0.

Model Timeline (1/2)



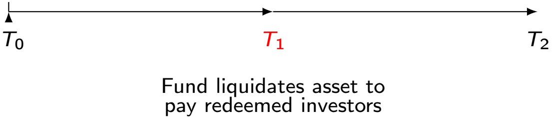
- T_{1-}: ν is drawn. Investors observe signals of ν and decide to redeem or not. The net-asset-value (NAV) of the fund is stale.

$$\text{NAV} = \frac{1}{p_0}\left[s \underbrace{\bar{p}_1}_{\text{pre-shock price}} + (1-s) \underbrace{p_1}_{\text{intrinsic price}} \right]$$

and $s \in (0,1)$ is a parameter for staleness.

- Investors can redeem at NAV

Model Timeline (2/2)



- The fund sells bonds at $\mathcal{L}p_1$ to pay redeeming investors
  $\mathcal{L} \leq 1$: bond liquidity.
- Redeemed investors invest in risk-free rate $(1 + r + \sigma\nu)$
- non-pecuniary benefit ψ if staying in a non-defaulted fund.

Investors' Payoffs

Investors are playing a coordination game. Assume λ proportion of investors in the fund redeem.

- An investor's payoff is

	$\lambda \leq \frac{\mathcal{L}p_1}{s\bar{p}_1+(1-s)p_1}$	$\lambda > \frac{\mathcal{L}p_1}{s\bar{p}_1+(1-s)p_1}$
Redeem	$\frac{\text{NAV}}{p_1}$	$\frac{\mathcal{L}p_1}{p_0\lambda} \times \frac{1}{p_1}$
Stay	$\frac{1}{1-\lambda} \times \left(\frac{1}{p_0} - \frac{\lambda NAV}{\mathcal{L}p_1}\right) + \frac{\psi}{p_0}$	0

Characterizing fragility

Global games: marginal investor with signal $x = \nu^*$ is indifferent between redeem and stay.

Investors redeem when

$$\underbrace{\frac{1}{p_0} p_1}_{\text{Intrinsic Price}} < \underbrace{NAV^*}_{\text{(stale) } NAV} \times \overbrace{g(\mathcal{L}, \psi)}^{\text{strategic redemption factor}}$$

Definition

Fragility is the likelihood of fund runs: $\mathbb{P}\left[\frac{1}{p_0} p_1 < NAV^* \times g(\mathcal{L}, \psi)\right]$.

Empirical proxy: outflow–$\Delta FFTar$ sensitivity.

Intuition behind the redemption threshold p_1^*

$$\underbrace{\frac{1}{p_0} p_1}_{\text{Intrinsic Price}} < \underbrace{NAV^*}_{\text{(stale) } NAV} \times \overbrace{g(\mathcal{L}, \psi)}^{\text{strategic redemption factor}}$$

$g(\mathcal{L}, \psi)$ captures the relative benefits of staying and redeeming

- $g(1, 0) = 1$
- high ψ = large benefit of staying, $g \searrow$
- low $\mathcal{L}$ = large fear of transaction cost, $g \nearrow$

Outline

Introduction

Evidence for the outflow-ΔFFTar relationship

A Model of Monetary-policy-induced fragility

Factors that affect MP-induced fragility

- Illiquidity
- Staleness
- Monetary policy environment

Conclusion

1. The effect of Illiquidity

$$\frac{\partial \mathbb{P}\left[\frac{1}{p_0} p_1 < NAV^* \times g(\mathcal{L}, \psi)\right]}{\partial(-\mathcal{L})} > 0$$

Intuition: Illiquidity increases fragility

$$\underbrace{\frac{1}{p_0}p_1}_{\text{Intrinsic Price}} < \underbrace{NAV^*}_{\text{(stale) } NAV} \times \overbrace{g(\mathcal{L},\psi)}^{\text{strategic redemption factor}}$$

As illiquidity $\nearrow$, g $\nearrow$, fragility $\nearrow$

- Reason: fears of liquidation cost when staying

Illiquidity intensifies outflow-$\Delta FFTar$ sensitivity (1/2)

- Illiquid funds: last year's percentage holding of liquid assets (cash and government bonds) is lower-than-sample median

Daily evidence: illiquid funds

	$\text{OutFlows}_{i,(-5,-1]}$			$\text{OutFlows}_{i,(-1,5]}$		
	Illiquid (1)	Liquid (2)	All (3)	Illiquid (4)	Liquid (5)	All (6)
$\widehat{\Delta \text{FFTar}_{[-1,1]}}$	0.873***	0.533***	0.533***	1.699***	1.073***	1.073***
	(0.206)	(0.109)	(0.110)	(0.311)	(0.279)	(0.279)
$\widehat{\Delta \text{FFTar}_{[-1,1]}}$ $\times \mathbb{1}$(Illiq. funds)			0.340			0.626**
			(0.218)			(0.290)
$\text{Controls}^F_{i,t-1}$	✓	✓	✓	✓	✓	✓
Fund FE	✓	✓	✓	✓	✓	✓
Observations	90,506	88,549	179,055	90,515	88,587	179,102

Illiquidity intensifies outflow-$\Delta FFTar$ sensitivity (2/2)

- Illiquid months: VIX is higher than top tercile of the sample period

Monthly evidence: illiquid months

	$OutFlow_{i,m}(\%)$ in Months with FOMC meetings & $\Delta FFTar_m \geq 0$		
	Illiquid	Liquid	All
	(1)	(2)	(3)
$\Delta FFTar_m$	2.700***	0.010	0.010
	(0.763)	(0.554)	(0.551)
$\Delta FFTar_m \times \mathbb{1}$(Illiq. months)			2.690***
			(0.961)
Controls	✓	✓	✓
Fund FE	✓	✓	✓
Observations	65,203	76,248	141,451

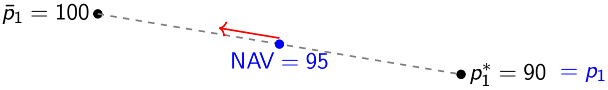
Results also hold for illiquid funds

2. The Effect of Staleness

$$\frac{\partial \mathbb{P}\left[\frac{1}{p_0} p_1 < NAV^* \times g(\mathcal{L}, \psi)\right]}{\partial s} \begin{array}{ll} > 0 & \text{for high liquidity} \\ < 0 & \text{for low liquidity} \end{array}$$

An illustrative example: staleness increases fragility

Suppose $\bar{p}_1 = 100$ and $s = 0.5$. High $\mathcal{L}$ case: $p_1^* = 90$.



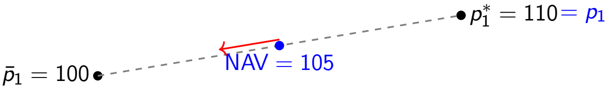
In words: In state of $p_1 = 90$, investors are indifferent between redeeming at NAV $= 0.5(100 + 90) = 95$ or staying.

Consider $s \nearrow$ to 0.6. When $p_1 = 90$, are investors still indifferent?

- NAV becomes (0.6*100+0.4*90)=96. Investors will redeem!
- Because investors now redeem at $p_1 = 90$, threshold $p_1^* \nearrow$;
- Fragility $\mathbb{P}(p_1 < p_1^*) \nearrow$

An illustrative example: staleness reduces fragility

Suppose $\bar{p}_1 = 100$ and $s = 0.5$. Low $\mathcal{L}$ case: $p_1^* = 110$.



In words: In state of $p_1 = 110$, investors are indifferent between redeeming at NAV $= 0.5(100 + 90) = 105$ or staying.

Consider $s \nearrow$ to 0.6. When $p_1 = 110$, are investors still indifferent?

- NAV becomes (0.6*100+0.4*110)=104. Investors will stay!
- Because investors now stay at $p_1 = 110$, threshold $p_1^* \searrow$;
- Fragility $\mathbb{P}(p_1 < p_1^*) \searrow$

Staleness decreases fragility when liquidity is low (1/2)

Daily evidence: illiquid funds

	$\text{OutFlows}_{i,(-5,-1]}$	$\text{OutFlows}_{i,(-1,5]}$	$\text{OutFlows}_{i,(5,15]}$
	(1)	(2)	(3)
$\widehat{\Delta\text{FFTar}_{[-1,1]}}$	0.390***	0.845***	0.853***
	(0.097)	(0.260)	(0.315)
$\widehat{\Delta\text{FFTar}_{[-1,1]}}$ $\times\mathbb{1}$(Illiquid funds)	0.367	0.735***	1.189***
	(0.253)	(0.270)	(0.339)
$\widehat{\Delta\text{FFTar}_{[-1,1]}}$ $\times\mathbb{1}$(Illiquid funds) $\times\mathbb{1}$(High-stale)	−0.328	−0.648*	−0.665
	(0.265)	(0.379)	(0.511)
$\text{Controls}^F_{i,t-1}$	✓	✓	✓
Fund FE	✓	✓	✓
Observations	179,055	179,102	178,153

Staleness decreases fragility when liquidity is low (2/2)

Monthly evidence: illiquid months & funds

	$OutFlow_{i,m}$(%) in Months with FOMC meetings & $\Delta FFTar_m \geq 0$	
	(1)	(2)
$\Delta FFTar_m$	−1.290	−1.367
	(0.923)	(1.375)
$\Delta FFTar_m \times \mathbb{1}$(Illiq. months)	4.122***	
	(1.434)	
$\Delta FFTar_m \times \mathbb{1}$(Illiq. funds)		2.851**
		(1.307)
$\Delta FFTar_m \times \mathbb{1}$(High-stale) $\times \mathbb{1}$(Illiq. months)	−2.915*	
	(1.545)	
$\Delta FFTar_m \times \mathbb{1}$(High-stale) $\times \mathbb{1}$(Illiq. funds)		−3.352**
		(1.624)
$\Delta Controls_m^M$	✓	✓
$Controls_{i,t-1}^F$	✓	✓
Fund FE	✓	✓
Observations	165,761	151,493

- Implication: Staleness can be stabilizing for illiquid funds or distressed times

3. The Effect of MP environment

$$\frac{\partial \mathbb{P}\left[\frac{1}{p_0} p_1 < NAV^* \times g(\mathcal{L}, \psi)\right]}{\partial - r} \begin{array}{ll} > 0 & \text{for high liquidity} \\ < 0 & \text{or low liquidity} \end{array}$$

Intuition: The effect of MP environment

Loose MP regime $\implies$ bond values more sensitive to $\Delta FFTar$

1. High liquidity $\rightarrow$ redeem only when NAV is sufficiently overpriced
   - Loose MP $\rightarrow$ larger overpricing $\rightarrow$ more fragility
2. Low liquidity $\rightarrow$ stay only when NAV is sufficiently underpriced
   - Loose MP $\rightarrow$ large underpricing $\rightarrow$ less fragility

Implications: fragility is particular severe in low-liquidity + tight monetary policy environment

Loose MP regime decreases fragility iff liq. is low

Monthly evidence: illiquid months & funds

	$OutFlow_{i,m}(\%)$ in Months with FOMC meetings & $\Delta FFTar_m \geq 0$	
	(1)	(2)
$\Delta FFTar_m$	-0.216	0.243
	(0.429)	(0.303)
$\Delta FFTar_m \times \mathbb{1}$(Low FFTar)	-0.065	1.427
	(0.987)	(0.881)
$\Delta FFTar_m \times \mathbb{1}$(Illiq. months)	1.524***	
	(0.469)	
$\Delta FFTar_m \times \mathbb{1}$(Illiq. funds)		0.873
	(0.652)	
$\Delta FFTar_m \times \mathbb{1}$(Illiq. months) $\times \mathbb{1}$(Low FFTar)	-2.934**	
	(1.206)	
$\Delta FFTar_m \times \mathbb{1}$(Illiq. funds) $\times \mathbb{1}$(Low FFTar)		-2.807**
		(1.229)
$\Delta Controls^M_m$	✓	✓
$Controls^F_{i,t-1}$	✓	✓
Fund FE	✓	✓
Observations	142,441	151,195

Outline

Introduction

Evidence for the outflow-ΔFFTar relationship

A Model of Monetary-policy-induced fragility

Factors that affect MP-induced fragility

Conclusion

Conclusion

We show theoretically and empirically that monetary policy can trigger strategic outflows in corporate bond mutual funds

- Stale NAV $\rightarrow$ strategic outflows
- Stronger effect in
  - 1) illiquid markets/funds
  - 2) illiquid markets/funds, especially for non-stale funds
  - 3) illiquid markets/funds in a tight MP region

Takeaways:

- A new MP-induced fragility in corporate bond funds
- Some staleness in NAV is desirable during distressed times
- MP regime and market conditions are important factors

THANK YOU!

Comparison of high v.s. low staleness funds

	log(TNA)	Institution	Cash+Bond Holding	Expense Ratio	High Yield	Maturity
	(1)	(2)	(3)	(4)	(5)	(6)
High Staleness	-0.094	0.005	-4.107^{***}	-0.0002^{*}	-0.022^{*}	-3.511^{***}
	(0.071)	(0.014)	(0.426)	(0.0001)	(0.011)	(0.142)
Year FE	✓	✓	✓	✓	✓	✓
Observations	123,209	123,605	122,849	107,146	123,605	115,144

back

Control for Long-term Treasury Yield Changes

	$\Delta NAV_{i,(\tau+5,-5]}$		$\Delta NAV_{i,(-5,-1]}$		$\Delta NAV_{i,(-1,5]}$		$\Delta NAV_{i,(5,15]}$	
	High-stale	Low-stale	High-stale	Low-stale	High-stale	Low-stale	High-stale	Low-stale
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
$\Delta Eurodollar_{(\tau+5,-5]}$	-1.051^{**}	-2.159	-0.648^{**}	-0.856				
	(0.487)	(1.326)	(0.306)	(0.574)				
$\Delta Treasury5y_{(\tau+5,-5]}$	-1.381^{***}	-3.712^{***}	-0.085	-0.132				
	(0.319)	(0.564)	(0.135)	(0.213)				
$\Delta Eurodollar_{(\tau+5,-1]}$					-0.679^{**}	-0.744		
					(0.261)	(0.500)		
$\Delta Treasury5y_{(\tau+5,-1]}$					-0.103	0.023		
					(0.220)	(0.330)		
$\Delta Eurodollar_{(\tau+5,5]}$							0.186	-0.373
							(0.282)	(0.355)
$\Delta Treasury5y_{(\tau+5,5]}$							-0.099	-0.209
							(0.152)	(0.304)
$Controls^F_{i,t-1}$	✓	✓	✓	✓	✓	✓	✓	✓
Fund FE	✓	✓	✓	✓	✓	✓	✓	✓
Observations	80,229	98,669	80,227	98,665	83,144	102,380	83,151	102,431
Adjusted R^2	0.209	0.409	0.092	0.068	0.097	0.021	0.087	0.081

back

Heterogeneous Effects

	$\text{OutFlows}_{i,(-5,-1]}(\%)$			
	Inst	Retail	Index	Non-index
	(1)	(2)	(3)	(4)
ΔFFTar_m	0.596***	0.802***	0.665	0.769***
	(0.094)	(0.232)	(0.405)	(0.148)
$\Delta\text{Controls}_m^M$	✓	✓	✓	✓
$\text{Controls}_{i,t-1}^F$	✓	✓	✓	✓
Fund FE	✓	✓	✓	✓
Observations	95,281	84,672	6,461	173,492

	$\text{OutFlows}_{i,(-5,-1]}(\%)$					
	High-yield			Investment-grade		
	All	High-stale	Low-stale	All	High-stale	Low-stale
	(1)	(2)	(3)	(4)	(5)	(6)
$\widehat{\Delta\text{FFTar}_{[-1,1]}}$	0.864**	0.962***	0.639	0.635***	1.057***	0.439***
	(0.407)	(0.331)	(0.496)	(0.113)	(0.167)	(0.095)
$\Delta\text{Controls}_m^M$	✓	✓	✓	✓	✓	✓
$\text{Controls}_{i,t-1}^F$	✓	✓	✓	✓	✓	✓
Fund FE	✓	✓	✓	✓	✓	✓
Observations	54,619	23,724	30,599	125,334	56,570	68,162

back

Reaching for Yield Alternative

Choi and Kronlund (2017): funds tilt their portfolios towards riskier bonds in low-interest rates regimes to attract flow.

Our results continue to hold after controlling for RFY predictors (1Y Yield, 30Y-1Y Spread, Baa-Aaa-Spread).

Control for RFY

	$OutFlows_{i,(-5,-1]}$			$OutFlows_{i,(-1,5]}$			$OutFlows_{i,(5,15]}$		
	High-stale (1)	Low-stale (2)	All (3)	High-stale (4)	Low-stale (5)	All (6)	High-stale (7)	Low-stale (8)	All (9)
$\Delta Eurodollar_{(\tau+5,-5]}$	1.058***	0.129	0.129						
	(0.191)	(0.148)	(0.148)						
$\Delta Eurodollar_{(\tau+5,-5]} \times \mathbb{1}$(High-stale)			0.929***						
			(0.195)						
$\Delta Eurodollar_{i,(\tau+5,-1]}$				1.030**	0.408***	0.408***			
				(0.406)	(0.121)	(0.121)			
$\Delta Eurodollar_{(\tau+5,-1]} \times \mathbb{1}$(High-stale)						0.622			
						(0.405)			
$\Delta Eurodollar_{i,(\tau+5,5]}$							0.612**	0.142	0.142
							(0.291)	(0.164)	(0.164)
$\Delta Eurodollar_{(\tau+5,5]} \times \mathbb{1}$(High-stale)									0.470
									(0.328)
1Y Yield	−0.041	0.056	0.056	0.046	0.068	0.068	0.072	0.175***	0.175***
	(0.034)	(0.034)	(0.035)	(0.062)	(0.052)	(0.052)	(0.068)	(0.061)	(0.061)
30Y-1Y Spread	−0.018	0.044*	0.044*	0.015	0.022	0.022	−0.063	0.083	0.083
	(0.024)	(0.026)	(0.026)	(0.046)	(0.041)	(0.041)	(0.054)	(0.064)	(0.064)
Baa-Aaa-Spread	0.009	−0.032	−0.032	−0.277**	−0.070	−0.070	−0.119	−0.272*	−0.272*
	(0.074)	(0.083)	(0.083)	(0.120)	(0.124)	(0.124)	(0.153)	(0.144)	(0.144)
VIX	−0.006	0.003	0.003	0.014*	0.001	0.001	−0.009	−0.004	−0.004
	(0.004)	(0.003)	(0.003)	(0.007)	(0.007)	(0.008)	(0.010)	(0.009)	(0.010)
$Controls^{F}_{i,t-1}$	✓	✓	✓	✓	✓	✓	✓	✓	✓
Fund FE	✓	✓	✓	✓	✓	✓	✓	✓	✓
Observations	74,041	90,314	164,355	76,958	94,076	171,034	76,513	93,566	170,079
Adjusted R^2	0.073	0.106	0.093	0.079	0.104	0.094	0.106	0.124	0.116

back

Control for return predictability from autocorrelation

	$OutFlows_{i,(-5,-1]}$			$OutFlows_{i,(-1,5]}$			$OutFlows_{i,(5,15]}$		
	High-stale (1)	Low-stale (2)	All (3)	High-stale (4)	Low-stale (5)	All (6)	High-stale (7)	Low-stale (8)	All (9)
$\Delta Eurodollar_{(\tau+5,-5]}$	0.840***	0.219**	0.219**						
	(0.137)	(0.095)	(0.095)						
$\Delta Eurodollar_{(\tau+5,-5]}$ $\times \mathbb{1}$(High-stale)			0.621***						
			(0.149)						
Return $Forecast_{(\tau+5,-5]}$	−0.129	−0.059	−0.059						
	(0.083)	(0.048)	(0.049)						
Return $Forecast_{(\tau+5,-5]}$ $\times \mathbb{1}$(High-stale)			−0.070						
			(0.064)						
$\Delta Eurodollar_{i,(\tau+5,-1]}$				1.095***	0.488***	0.488***			
				(0.353)	(0.111)	(0.111)			
$\Delta Eurodollar_{(\tau+5,-1]}$ $\times \mathbb{1}$(High-stale)						0.607*			
						(0.343)			
Return $Forecast_{(\tau+5,-1]}$				−0.393***	−0.162**	−0.162**			
				(0.114)	(0.078)	(0.078)			
Return $Forecast_{(\tau+5,-1]}$ $\times \mathbb{1}$(High-stale)						−0.231***			
						(0.086)			
$\Delta Eurodollar_{i,(\tau+5,5]}$							0.810***	0.381***	0.381***
							(0.216)	(0.122)	(0.122)
$\Delta Eurodollar_{(\tau+5,-1]}$ $\times \mathbb{1}$(High-stale)									0.429*
									(0.246)
Return $Forecast_{i,(\tau+5,5]}$							−0.122	−0.126	−0.126
							(0.108)	(0.091)	(0.094)
Return $Forecast_{(\tau+5,5]}$ $\times \mathbb{1}$(High-stale)									0.004
									(0.103)
$Controls^F_{i,t-1}$	✓	✓	✓	✓	✓	✓	✓	✓	✓
Fund FE	✓	✓	✓	✓	✓	✓	✓	✓	✓
Observations	75,665	93,053	168,718	78,056	95,921	173,977	80,342	98,991	179,333
Adjusted R^2	0.216	0.269	0.248	0.262	0.289	0.278	0.224	0.203	0.212

Treasuries Bond Funds

NAVs

	$\Delta NAV_{i,(\tau+5,-5]}$	$\Delta NAV_{i,(-5,-1]}$	$\Delta NAV_{i,(-1,5]}$	$\Delta NAV_{i,(5,15]}$
	(1)	(2)	(3)	(4)
$\Delta Eurodollar_{(\tau+5,-5]}$	-2.548^{**}	-0.162		
	(1.212)	(0.616)		
$\Delta Eurodollar_{(\tau+5,-1]}$			-0.253	
			(0.754)	
$\Delta Eurodollar_{(\tau+5,5]}$				-0.564
				(0.439)
$Controls^F_{i,t-1}$	✓	✓	✓	✓
Fund FE	✓	✓	✓	✓
Observations	3,690	3,690	3,846	3,925
Adjusted R^2	0.079	0.034	0.033	0.053

OutFlows

	$OutFlows_{i,(-5,-1]}$	$OutFlows_{i,(-1,5]}$	$OutFlows_{i,(5,15]}$
	(1)	(2)	(3)
$\Delta Eurodollar_{(\tau+5,-5]}$	1.129		
	(0.886)		
$\Delta Eurodollar_{(\tau+5,-1]}$		2.148^{***}	
		(0.655)	
$\Delta Eurodollar_{(\tau+5,5]}$			0.041
			(0.695)
$Controls^F_{i,t-1}$	✓	✓	✓
Fund FE	✓	✓	✓
Observations	3,687	3,864	3,856
Adjusted R^2	0.059	0.078	0.040

back

References I

Adrian, Tobias and Hyun Song Shin. 2008. "Financial Intermediaries, Financial Stability, and Monetary Policy." *FRB of New York staff report* (346).

Banegas, Ayelen, Gabriel Montes-Rojas, and Lucas Siga. 2016. "Mutual Fund Flows, Monetary Policy and Financial Stability." *Finance and Economics Discussion Series* 2016 (071):1–58.

Chen, Qi, Itay Goldstein, and Wei Jiang. 2010. "Payoff Complementarities and Financial Fragility: Evidence from Mutual Fund Outflows." *Journal of Financial Economics* 97 (2):239–262.

Choi, Jaewon and Mathias Kronlund. 2017. "Reaching for Yield in Corporate Bond Mutual Funds." *Review of Financial Studies* 17:63–36.

Choi, Jaewon, Mathias Kronlund, and Ji Yeol Jimmy Oh. 2022. "Sitting bucks: Stale pricing in fixed income funds." *Journal of Financial Economics* 145 (2):296–317.

References II

Di Maggio, Marco and Marcin Kacperczyk. 2017. "The unintended consequences of the zero lower bound policy." *Journal of Financial Economics* 123 (1):59–80. URL https://linkinghub.elsevier.com/retrieve/pii/S0304405X1630157X.

Drechsler, Itamar, Alexi Savov, and Philipp Schnabl. 2018. "A Model of Monetary Policy and Risk Premia: A Model of Monetary Policy and Risk Premia." *The Journal of Finance* 73 (1):317–373. URL https://onlinelibrary.wiley.com/doi/10.1111/jofi.12539.

Falato, Antonio, Itay Goldstein, and Ali Hortaçsu. 2021. "Financial fragility in the COVID-19 crisis: The case of investment funds in corporate bond markets." *Journal of Monetary Economics* 123:35–52.

Fang, Chuck. 2022. "Monetary Policy Amplification through Bond Fund Flows." *Jacobs Levy Equity Management Center for Quantitative Financial Research Working Paper* .

References III

Feroli, Michael, Anil K Kashyap, Kermit L Schoenholtz, and Hyun Song Shin. 2014. "Market Tantrums and Monetary Policy." *SSRN Electronic Journal* .

Goldstein, Itay, Hao Jiang, and David T Ng. 2017. "Investor Flows and Fragility in Corporate Bond Funds." *Journal of Financial Economics* 126 (3):592–613.

Ivashina, Victoria and Bo Becker. 2015. "Reaching for Yield in the Bond Market." *The Journal of Finance* 70 (5):1863–1902.

Koont, Naz, Yiming Ma, Lubos Pastor, and Yao Zeng. 2022. "Steering a ship in illiquid waters: Active management of passive funds." Tech. rep., National Bureau of Economic Research.