

Fragility of Safe Asset Markets

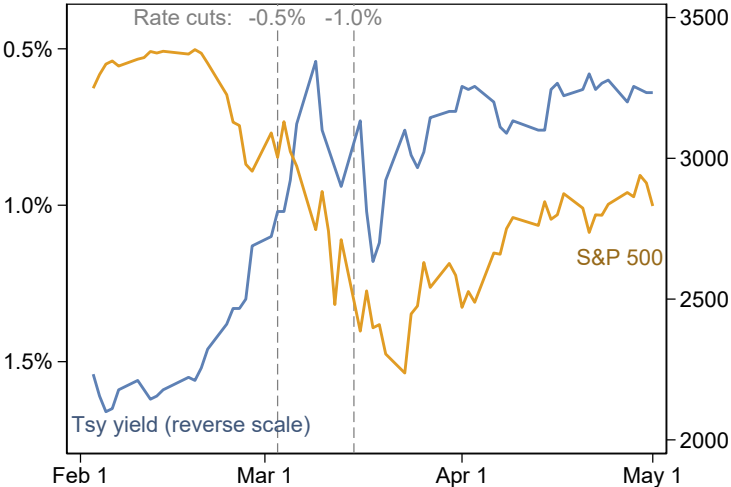
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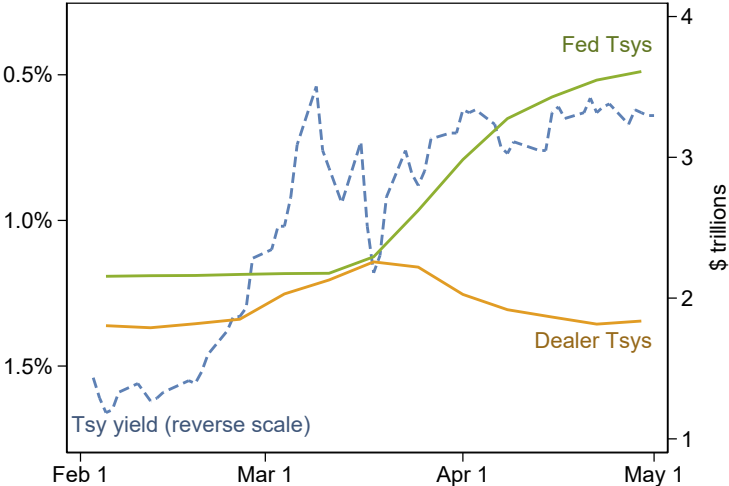
Motivation, Part 1 of 3

March 2020: “Flight to safety” turns into “dash for cash”



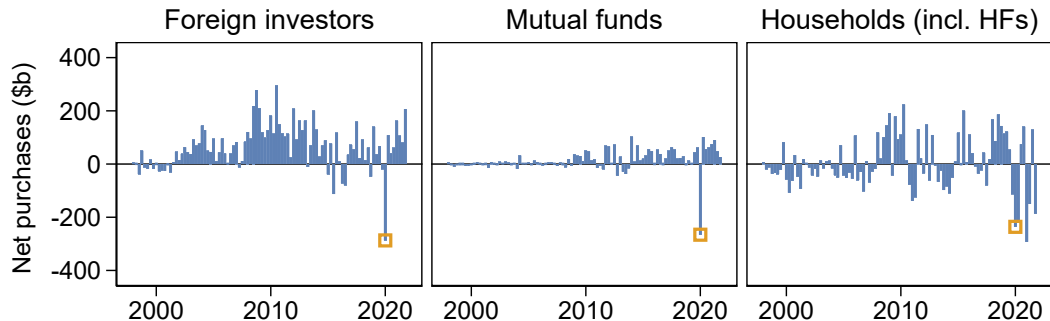
Motivation, Part 2 of 3

March 2020: Dealer balance sheets fill up during run-up and crash



Motivation, Part 3 of 3

March 2020: Precautionary Sales



- Sales are **big**: 3, 5, and 2 sigmas (post-2008 period)
- Sales are in **excess** of liquidity needs (Vissing-Jørgensen, 2021)
 - Foreign officials hoard $\sim 75\%$ of sales (in USD cash-equivalents); Mutual funds $\sim 35\%$
 - ➔ Diamond-Dybvig (1983) “late consumers” withdrawing early?

This paper

In a nutshell

- Main modeling ingredients
 - Two fundamental characteristics of safe assets
 1. Safety — low credit risk, low (or negative) beta
 2. Liquidity — easy to sell, “money-like”
 - Dealer constraints (or limits to arbitrage more generally)
 - Net sales can lead to **persistent price dislocations**
- Implications:
 - Safe asset markets can be **fragile**, potential for preemptive sales and price crashes
 - Flight to safety can **trigger** dash for cash

This paper

Safe Assets: Safety vs. liquidity

- Different investors hold safe assets for different reasons
 - “Safety investors” use for diversification, **buy in times of stress**
 - “Liquidity investors” use for liquidity insurance, **sell in times of stress**
 - Symbiotic relationship with offsetting flows?
- Some liquidity investors don't need liquidity today
 - Choice: sell preemptively today **or** risk having to sell tomorrow
 - Potential for **strategic** interaction

Preview of results

Key result 1: Potential for fragility

- Liquidity investors can face *strategic complementarities*
 - Markets usually feature *strategic substitutes*:
Other investors sell → price decreases → I want to buy (all else equal)
 - Potential *strategic complementarities*:
Other investors sell → price decreases today **and** tomorrow (dealer inventory)
→ I want to **sell** (try to get out today rather than risk worse price tomorrow)
- Self-fulfilling equilibria: all investors hold (market stable) or sell (market collapse)
- Global game with **switching equilibrium**
 - Prices drop when equilibrium switches from hold to sell and market is flooded with sales
 - Policy announcements can have large effects by switching equilibrium

Preview of results

Key result 2: Flight to Safety and Dash for Cash

- What if safety investors buy in times of stress?
 - Effect on prices today **and** tomorrow (through dealer inventory)
 - Demand from safety investors generates feedback
 - Market relatively **stable** → safety investor demand **stabilizing**
 - Market relatively **fragile** → safety investor demand **destabilizing**
- Flight to safety can trigger dash for cash
- Policy interventions must be large and persistent otherwise they will backfire

Model setup

- Two periods $t = 0, 1$
- Two assets: safe and risky
- Three types of agents:
 - **Dealers:** Risk neutral but balance sheet costs → residual demand for safe asset
 - **Liquidity investors:** Risk neutral but liquidity shocks → hold safe asset as insurance
 - **Safety investors:** Risk averse → hold portfolio of risky and safe asset (ignore for now)

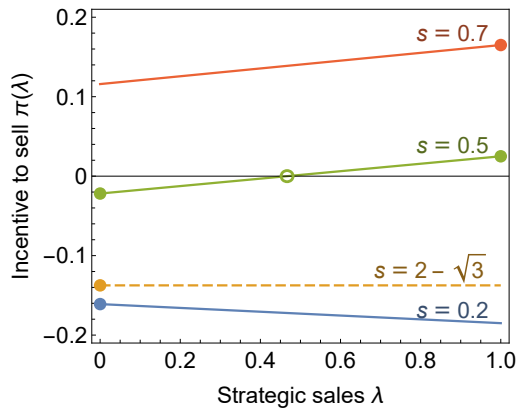
Measure 1 of each, act competitively, discount rate 0

Liquidity investors

- Endowed with one unit of safe asset
 - Face i.i.d. liquidity shocks with prob. $s \in (0, 1)$
 - Shocked at $t = 0 \rightarrow$ sell at p_0 and consume
 - Not shocked at $t = 0$ but at $t = 1 \rightarrow$ sell at p_1 and consume
 - Not shocked at all \rightarrow continuation value $v > 1$
- \rightarrow Investors not shocked at $t = 0$ act **strategically**
- Sell preemptively at $t = 0 \rightarrow$ guaranteed payoff: p_0
 - Hold and risk a shock at $t = 1 \rightarrow$ expected payoff: $s p_1 + (1 - s) v$

Incentive to sell and equilibria

- Suppose fraction $\lambda \in (0, 1)$ of strategic liquidity investors **sell preemptively**
- Incentive to sell (payoff gain): $\pi(\lambda) = p_0^e(\lambda) - (s p_1^e(\lambda) + (1 - s) v)$

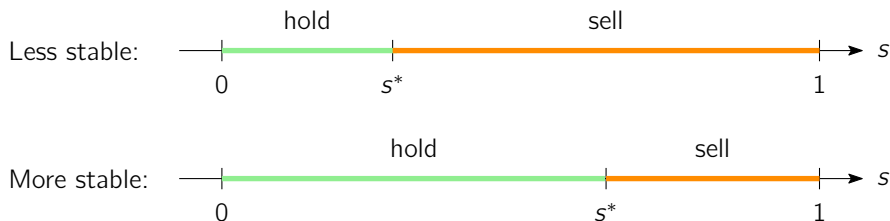


→ Equilibria with complete info

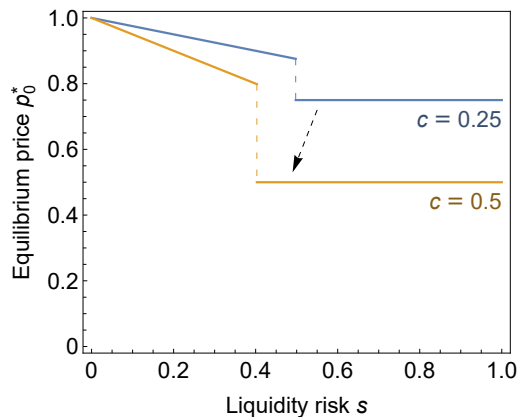
- Low liquidity risk: **only** hold eq'm
- High liquidity risk: **only** sell eq'm
- Medium liquidity risk: **multiplicity**
→ use global game to select eq'm

Global game equilibrium

- Prob. s of i.i.d. liquidity shocks observed with noise, take zero-noise limit
 - Unique equilibrium is in switching strategies around threshold s^*
- Switching point s^* is a proxy for **market stability**:



Price crash and balance sheet costs



- Price drops discontinuously at s^*
- Higher balance sheet cost c ...
 1. Reduces $s^* \rightarrow$ lower stability
 2. Increases discontinuity \rightarrow bigger crash

$$\Delta p_0^* = c(1 - s^*)$$

Safety investors

- Risk averse, portfolio of safe asset and risky asset with $E[z] = \mu$
 - Bad news about $\mu \rightarrow$ flight-to-safety demand
 - Increases prices today **and** tomorrow \rightarrow ambiguous effect
 - Increases p_0^e (absorbs some sales) \rightarrow destabilizing, can sell today at a higher price
 - Increases p_1^e (lower dealer inventory) \rightarrow stabilizing, forced selling tomorrow not as costly
- \rightarrow Which effect dominates? Recall: $\pi(\lambda) = p_0^e(\lambda) - (s p_1^e(\lambda) + (1 - s) v)$
- **Stabilizing** when liquidity risk s is **high**
 - **Destabilizing** when liquidity risk s is **low**
- \rightarrow In which region is the threshold s^* ? Depends on balance sheet costs!

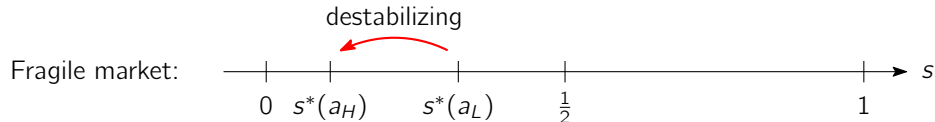
Interaction flight to safety and dash for cash

- Low balance sheet costs (pre-2008)



→ Flight to safety can **prevent** dash for cash

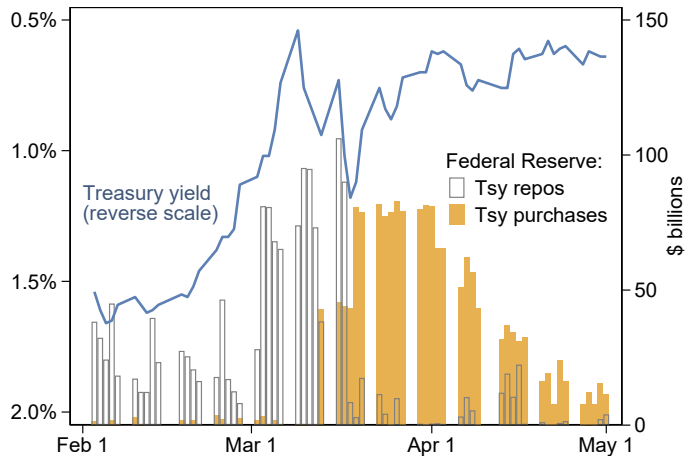
- High balance sheet costs (post-2008)



→ Flight to safety can **trigger** dash for cash

Policy 1: Dealer constraints

- SLR constrains dealer Treasury holdings, not relaxed until April 1

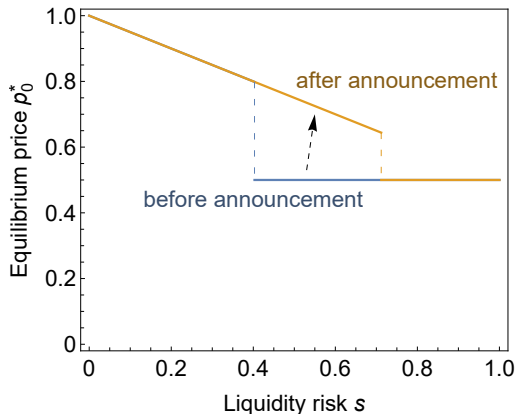


- Repo funding doesn't help
 - Purchases do help
- State-contingent SLR
- Relax in times of stress
 - Tsy holdings and repos

Policy 2: Asset purchases

Announcement effects

- Fed announces at $t = 0$ asset purchases at $t = 1$

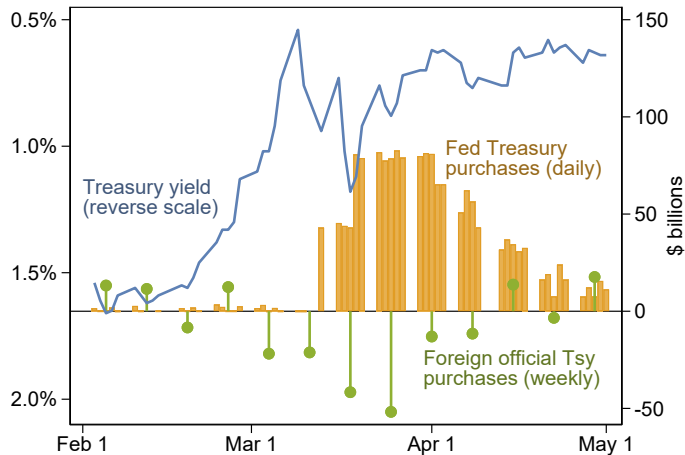


- Announcement shifts $s_{pre}^* \nearrow s_{post}^*$
 - Switch from sell to hold equilibrium for $s \in [s_{pre}^*, s_{post}^*]$
 - Price jumps on announcement at $t = 0$
 - No large effect of purchases at $t = 1$
- As happened for corporate bonds (cf. HaddadMoreiraMuir2021)

Policy 2: Asset purchases

But have to be careful

- Treasury purchases start small, without clear size or commitment



- Foreign sales initially increase
 - Consistent with initial purchases **destabilizing**
- Foreign sales stop after “whatever it takes”
 - Consistent with switch to hold equilibrium

Conclusion

- Safe assets held for different reasons (safety vs. liquidity)
 - Potentially symbiotic relationship → markets generally stable
- Strategic interaction of liquidity investors
 - Potential for fragility
 - Worse when dealers face tighter constraints
 - Potentially amplified by safety investors
- Perfect storm in March 2020
 - Low market depth post-GFC
 - Unusually large liquidity shock and risk asset shock
 - Flight to safety turns into dash for cash

Thank you!