Treasury Bill Shortages and the Pricing of Short-Term Assets

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Why has the Fed lost control over money markets?

- This paper proposes a model to shed light on money markets
- Based on 4 stylized facts
- Key ingredients
  - Intermediary asset pricing model
  - Liquidity needs driven by fire sale externality
  - Regulated banks (T-banks) manage liquidity needs via reserves
  - Unregulated banks (C-banks) cannot hold reserve, hold Tbills
- Key idea: ample reserves $\rightarrow$ segmented money mkts & pricing
- With too ample reserves & relative scarcity of Tbills:
  - T-banks satiated w/ liquidity, no liq. prem on reserves
  - T-banks sell T-bills to S-banks until zero holdings
  - More reserves $\downarrow$ Tbill supply, $\uparrow$ S-banks' liq. exps. & premium
- Additional features in full model to allow for quantitative exploration of mechanism's strength

How does monetary policy work?
Open Market Operations historically

Banks

Assets		Liab.	
R	\$80	D	\$900
B	\$120		
L	\$800	E	\$100

Central Bank

Assets		Liab.	
B	\$80	R	\$80

Government

Assets		Liab.	
T	\$200	B	\$200

R = Reserves; B = Treasuries;
L = Loans; D = Deposits;
E = Equity; T = Taxes

How does monetary policy work?
Open Market Operations historically

Banks

Assets		Liab.	
R	\$80+\$40	Dep	\$900
B	\$120-\$40		
L	\$800	Eqty	\$100

Central Bank

Assets		Liab.	
B	\$80+\$40	R	\$80+\$40

Government

Assets		Liab.	
T	\$200	B	\$200

R = Reserves; B = Treasuries;

L = Loans; D = Deposits;

E = Equity; T = Taxes

How does monetary policy work? Open Market Operations historically

Banks

Assets		Liab.	
R	\$120	D	\$900
B	\$80		
L	\$800	E	\$100

Central Bank

Assets		Liab.	
B	\$120	R	\$120

Government

Assets		Liab.	
T	\$200	B	\$200

R = Reserves; B = Treasuries; L = Loans; D = Deposits;
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- Federal funds rate (FFR): rate on overnight-interbank loans
- CB's bond buying $\uparrow R \Rightarrow \downarrow$ banks need for reserves $\Rightarrow \downarrow FFR$
- $FFR \approx$ other overnight rates

Some of the new changes to how monetary policy works

- CB flooded fin. system with safe-and-liquid assets
  - Staggering increase in reserves until 2015
  - Fed added overnight reverse repurchase agreement facility: expanded liquidity supply to money market funds & GSEs
- Interest on reserves (IOR) and ON RRP rates in conjunction with open market operations to control FFR and other overnight rates
- New programs tailored to non-traditional banks

Monetary policy in the post-crisis

Banks

Assets		Liab.	
R	\$100	D	\$900
B	\$40		
F	\$60		
L	\$800	E	\$100

Central Bank

Assets		Liab.	
B	\$200	R	\$100
		RRP	\$100

Shadow Banks

Assets		Liab.	
B	\$160	D	\$190
		F	\$60
RRP	\$100	E	\$10

Government

Assets		Liab.	
T	\$400	B	\$400

R = Reserves; B = Treasuries; L = Loans; D = Deposits;
E = Equity; T = Taxes ; RRP = R. Repo ; F = Repo

Monetary policy in the post-crisis

Banks

Assets		Liab.	
R	\$100 + \$50	D	\$900
B	\$40		
F	\$60		
L	\$800	E	\$100

Shadow Banks

Assets		Liab.	
B	\$160	D	\$190
		F	\$60
RRP	\$100	E	\$10

R = Reserves; B = Treasuries; L = Loans; D = Deposits;
E = Equity; T = Taxes ; RRP = R. Repo ; F = Repo

Monetary policy in the post-crisis

Banks

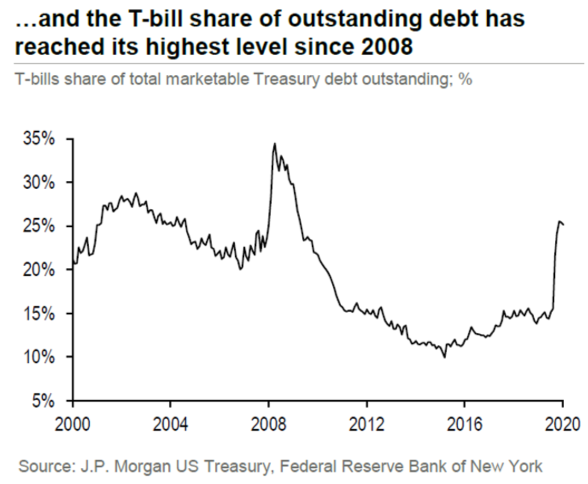
Assets		Liab.	
R	\$100	D	\$900
B	\$40	+	\$50
F	\$60 + \$50		
L	\$800	E	\$100

Shadow Banks

Assets		Liab.	
B	\$160+ \$50	D	\$190
		F	\$60 + \$50
RRP	\$100	E	\$10

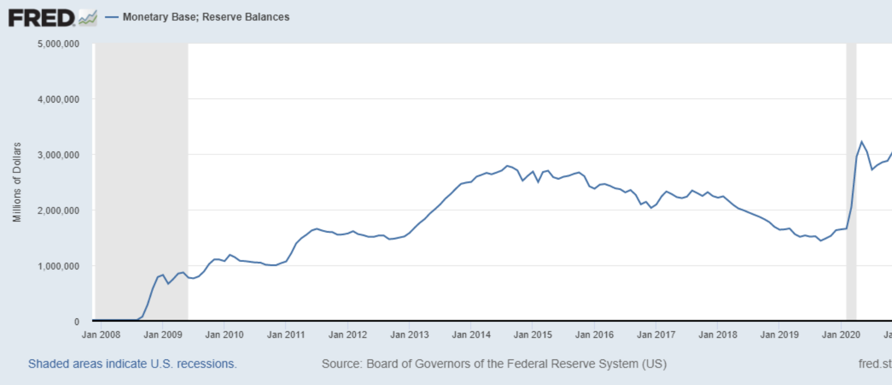
- Without frictions: overnight money market rates integrated
- What are the frictions that led to disconnect?
- This paper:
  - Emphasizes liquidity risk sharing function
  - Mechanism rests on rel. scarcity of Tbills & reserves abundance
  - Other role of money market is facilitating payments

Scarcity of Tbills?



- Why are S-banks liquidity needs so high?
- Tbills share on increasing US debt: last $23.3 Trill.

Do banks have enough reserves to facilitate payments?



Do banks have enough liquidity?

- Copeland, Duffie, Yang (2021) dispute that reserves are ample since Fed began to "normalize" its balance sheet
- Friction:
  Liquidity requirements
  Banks manage *intraday* liquidity needs via reserves
- When intraday payment demands increase, banks reluctant to invest reserve in repo markets
- Banks delay outgoing payments to wait for incoming payments to ensure liquidity
- Payment delays associated with money market rate spikes
- Reserve scarcity began end 2017

Why has the Treasury market outgrown dealer's capacity?

- Regulation tightened: liquidity & maximum leverage requirements (in the paper)

- Growing demand for marketable Treasuries from non-bank market participants (in the paper)

- But what drives demand to such unprecedented levels
  - More "S-banks" due to tighter regulation
    Buchak, Matvos, Piskorski, Seru (2018)
    Begenau and Landvoigt (2021)
  - More Treasury supply!
    Plumbing of financial markets may no longer be able to absorb larger and larger amounts of treasury issuances without clogs

Conclusion

- Fantastic paper that proposes a comprehensive yet parsimonious framework to analyze money markets
- Interesting to explore liquidity risk hedging motives in conjunction with payment role of money markets
  - Can your quantitative exercise tease out whether plumbing or supply issues are to blame?

Few random things I noted while reading the paper

- Why do intermediaries have the same *lambda* for their liquidity constraint?
- Figure 4, "2. Mechanical Effect" CB balance sheet reversed & "I" seems a bit off too.
- Only banks, GSEs, or money market funds can access ON RRP facility.
- Overall, would be more precise with the definition of S-banks. Dealers are in fact heavily regulated, while money market funds are not levered... Related to that, fact 2 doesn't seem compelling
- Report evidence of low liquidity premium on repos in main paper
- The copeland-duffie-yang paper should be cited in the literature review. It's highly related to your work
- Description of the quantification is a bit sparse. What do you do exactly!

- Allow quantitative exercise to use actual reserve balance