Stablecoins and short-term funding markets

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Discussion by Gordon Liao

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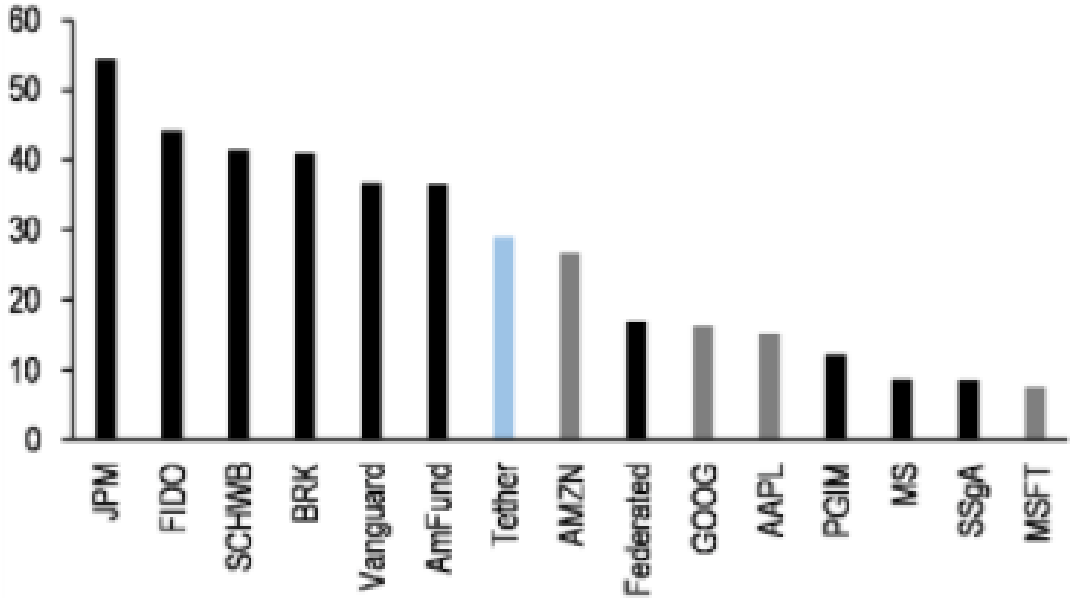
Overview

- Key findings:
  - Stablecoin demand led to purchases of CPs/CDs
  - Demand shift is met with elastic supply curve: More CP issuance, no rate change (no demand substitution)
  - Asymmetric response: Impact from stablecoin demand expansion (no impact from shrinkage)
- Main comments:
  - CP supply elasticity and real-economy impact
  - Stablecoin backing with other short-term funding instruments
  - Implications on optimal stablecoin design

Stablecoin issuers held large amount of CP/CDs

Exhibit 3: If considered alongside on and offshore prime money market funds, the Tether reserve fund would already be firmly in the top ten

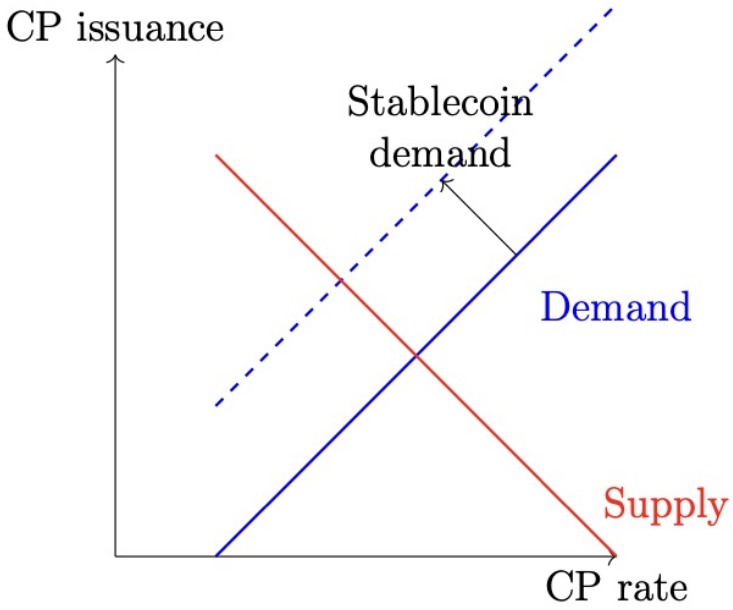
Holdings of CP/CD among prime MMFs, corporates* and Tether ; $bn



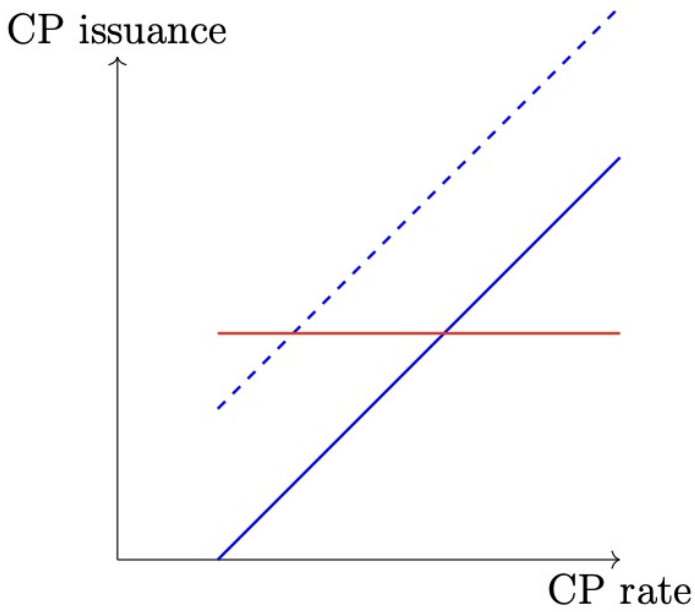
Note: Corporates estimated from 10-Qdisclosure for 1Q 2021. We use cash and equivalent corporate debt instruments where disclosed explicitly, otherwise <1yr from maturity. Money market fund holdings are assumed to be all prime and are scaled using overall allocation to CP/CD across the complex.

Source: J.P. Morgan, iMoneyNet, coinmarketcap.com, Cranes, company

Demand for stablecoin and underlying backing assets



Downward sloping supply



Perfectly elastic supply

Simple model

Market clearing:

$$D(r_{CP}) + \delta_d M_d = S(r_{CP})$$

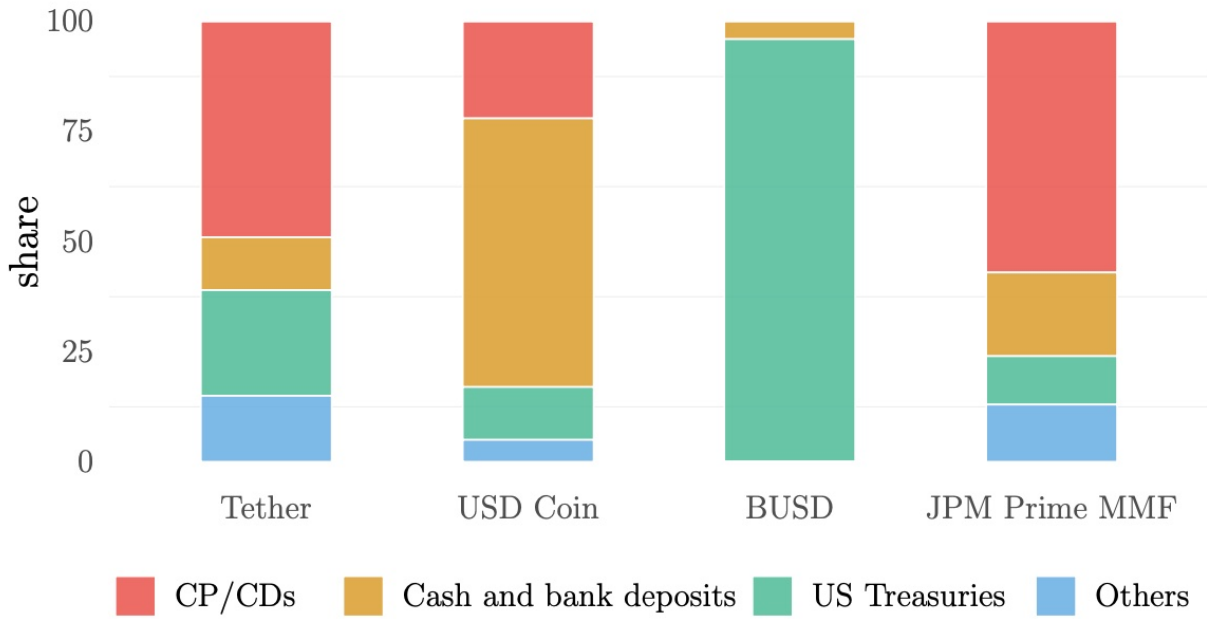
Comparative statics:

$$\frac{\partial S}{\partial M_d} = \delta_d \frac{S'}{S' - D'} \in [0, \delta_d)$$

$$\frac{\partial r_{CP}}{\partial M_d} = \delta_d \frac{1}{S' - D'} < 0$$

Expected coefficient $\delta_d < 1$

Figure 4: Stablecoins' reserve assets composition and comparison with JP Morgan Prime Money market funds allocation



Note: Source: Circle (composition as of May 28, 2021), Tether (composition as of June 30, 2021), JPM Prime MMF (composition as of March 31, 2022). 13% of USDC reserves is composed of Yankee CDs; the split between CD and CP is unknown for Tether. For BUSD, we take the first available report, issued in January 2022. Before that, independent accountants reported that the reserve assets of BUSD were mainly held in cash deposits with US-regulated depository institutions.

Empirical results find support for shift along supply curve

Table 5: USDT, USDC and CP issuances by maturity, issuer and rating

This table reports the estimated coefficient of variation in tokens supply, separately for USDT and USDC. The dependent variable is the daily variation in CP issuance, expressed in billion USD, for different categories of maturity, issuer and credit rating. Δ Tokens USDT+USDC is the daily change in tokens circulating supply, in billion. Controls include, as before, variations in excess reserves, effective fed funds rate, Fed CP purchases, log(Debt/GDP), Nasdaq, VIX. Significance levels are denoted: *** at 1%, ** at 5% and * at 10%. Newey-West standard-errors with a lag of 5. 95% confidence intervalc shown in brackets.

	Maturity			
	All mat.	1d to 4d	5d to 80d	>80d
	(1)	(2)	(3)	(4)
Δ Tokens USDT	1.754*	1.446**	-0.0270	0.3351*
	[-0.0112; 3.520]	[0.0241; 2.869]	[-0.8436; 0.7896]	[-0.0304; 0.7006]
Δ Tokens USDC	2.167**	1.268	1.017**	-0.1175
	[0.3409; 3.993]	[-0.4377; 2.973]	[0.0216; 2.012]	[-0.4753; 0.2404]
Controls	✓	✓	✓	✓
Weekday-FE	✓	✓	✓	✓
Observations	865	865	865	865
R^2	0.15490	0.22954	0.17753	0.06911

Also key finding: no impact on rates ⇒ **perfectly elastic supply curve**

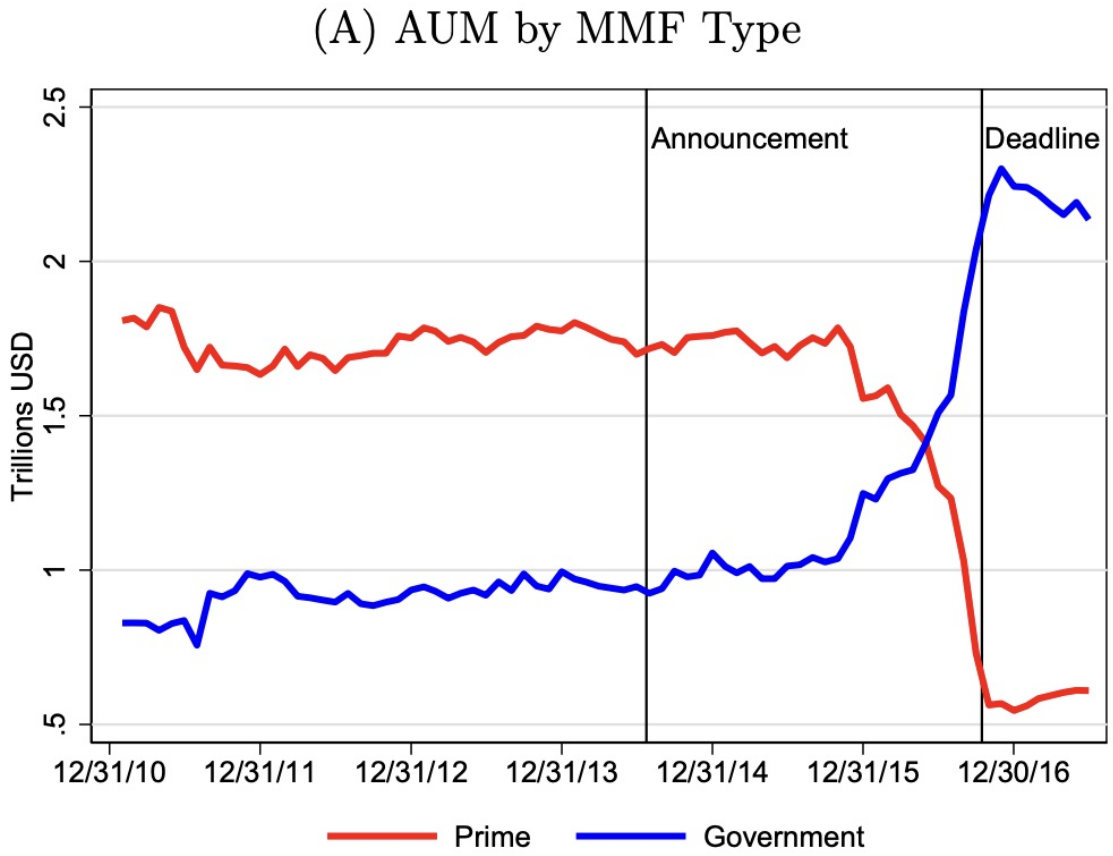
Comment 1: Why is CP supply elastic?

What are unsecured wholesale funding (CP/CDs) used for?

- **Pre-2008**: Used for credit provision; large negative wholesale funding shocks have led to fire sales of assets, significant contractions in credit supply, and elevated financial distres (e.g. Diamond and Rajan, 2009; Shin, 2009; Schnabl, 2012; Chernenko and Sunderam, 2014; Ivashina, Scharfstein, and Stein, 2015).
- **Post-2008**: Used for arbitrage; wholesale funding shock leads to less arbitrage by foreign banks in short-term funding markets, e.g. IOER-Fed fund, CIP, etc (Aldasoro, Ehlers, and Eren, 2019; Anderson, Du, and Schlusche, 2021)

Comment 1: Why is CP supply elastic?

Large shock to CP/CD market from 2016 MMF reform had no impact on loans



Anderson, Du, and Schlusche, 2021

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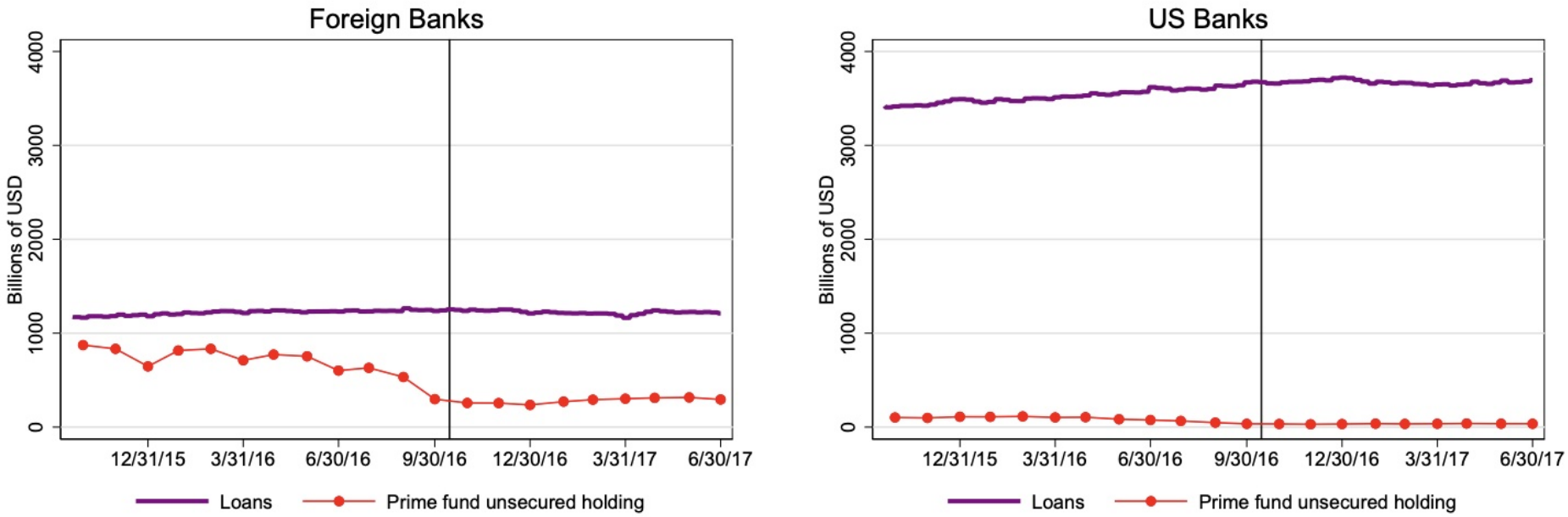


Anderson, Du, and Schlusche, 2021

Comment 2: Are stablecoin demand for short-term funding instruments stabilizing or destablizing?

Asymmetric response from issuance/redemption

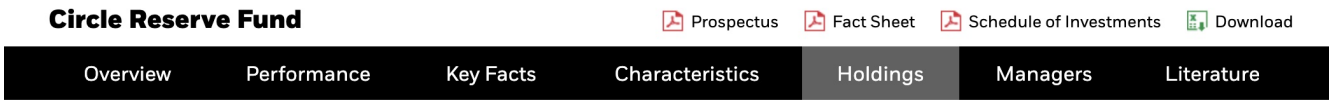
Table 6: USDT, USDC tokens and CP issuances by maturity, issuer and rating

This table reports the estimated coefficient of variation in tokens supply, separately for positive and negative variation, both for USDT and USDC. The dependent variable is the daily variation in CP issuance, expressed in billion USD, for different categories of maturity, issuer and credit rating. $\Delta-$ Tokens USDT is the eventual negative daily change in USDT tokens circulating supply at date t, in billion. Controls include, as before, variations in excess reserves, effective fed funds rate, Fed CP purchases, log(Debt/GDP), Nasdaq, VIX. Significance levels are denoted: *** at 1%, ** at 5% and * at 10%. Newey-West standard-errors with a lag of 5.

	Maturity				Issuer/Rating			
	All mat.	1d to 4d	5d to 80d	>80d	Fin. AA	Non-fin. AA	Non-fin. A2P2	ABCP AA
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
$\Delta-$ Tokens USDC	-2.461	-1.907	0.6085	-1.163	-0.0843	0.3653	-0.0482	0.4646
	(5.898)	(3.968)	(2.387)	(0.9591)	(1.233)	(1.105)	(0.6636)	(1.100)
$\Delta+$ Tokens USDC	2.174**	1.252	0.9882*	-0.0656	0.0338	0.2888	0.1289**	0.2362*
	(1.006)	(0.9455)	(0.5710)	(0.2101)	(0.2036)	(0.2371)	(0.0645)	(0.1313)
$\Delta-$ Tokens USDT	0.5380	0.5224	-0.2598	0.2755	0.2558*	-0.5466	-0.0638	0.2674
	(0.8732)	(0.9690)	(0.5895)	(0.2068)	(0.1520)	(0.3466)	(0.0610)	(0.2707)
$\Delta+$ Tokens USDT	2.530**	2.037**	0.1240	0.3687	0.1314	0.7903*	0.1250	0.4041**
	(1.282)	(0.7557)	(0.6595)	(0.2991)	(0.1517)	(0.4232)	(0.1061)	(0.2038)
Controls	✓	✓	✓	✓	✓	✓	✓	✓
Weekday-FE	✓	✓	✓	✓	✓	✓	✓	✓
Observations	865	865	865	865	865	865	865	865
R^2	0.15643	0.23134	0.11765	0.06982	0.07252	0.45944	0.04763	0.11553

Recent shift into other short-term funding markets

Circle Reserve Fund (2a7 fund of one) composition as of May 24, 2023



Holdings

All

as of 24-May-2023

Custom Columns

Filter list by keyword

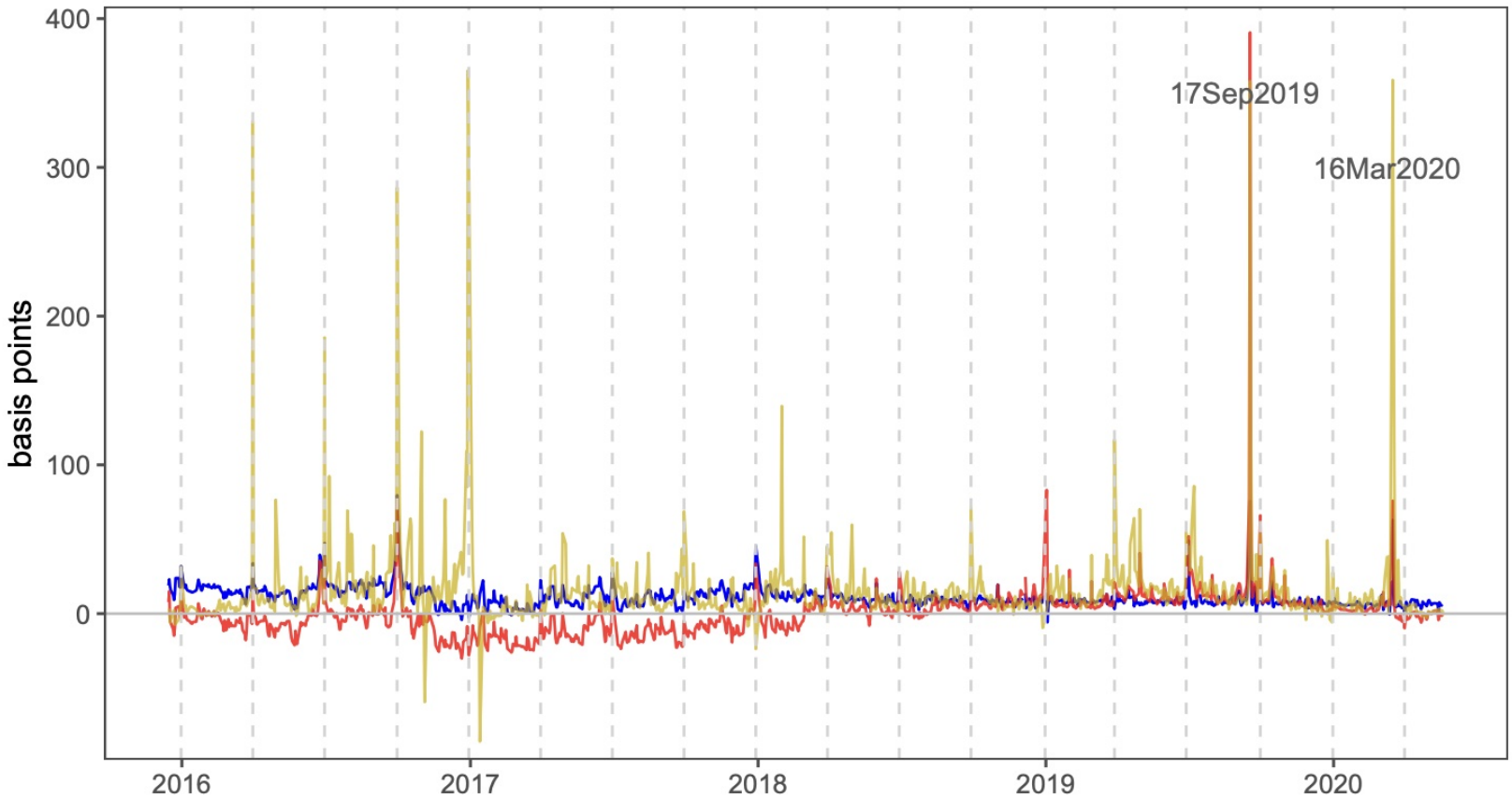
Position Description	%Par	Par	Identifier	Yield/Coupon	Final Maturity	Maturity/Reset
TREASURY BILL	24.82	5,304,655,000.00	912797FG7	3.89	30-May-2023	30-May-2023
TRI-PARTY GOLDMAN SACHS & CO. LLC	13.57	2,900,000,000.00	BRYJ22KC7	4.99	25-May-2023	25-May-2023
TRI-PARTY BOFA SECURITIES INC.	13.10	2,800,000,000.00	BRYJ22HX5	4.95	25-May-2023	25-May-2023
TRI-PARTY BNP PARIBAS	13.10	2,800,000,000.00	BRYJ22JA3	0.00	25-May-2023	25-May-2023
TREASURY BILL	12.20	2,608,000,000.00	912796ZF9	4.42	25-May-2023	25-May-2023
TRI-PARTY MORGAN STANLEY & CO LLC	5.89	1,258,000,000.00	BRYJ22KF0	5.02	25-May-2023	25-May-2023
TRI-PARTY ROYAL BANK OF CANADA (NE	5.15	1,100,000,000.00	BRYJ22KB9	5.01	25-May-2023	25-May-2023
TRI-PARTY BARCLAYS CAPITAL INC.	4.68	1,000,000,000.00	BRYJ22J39	5.00	25-May-2023	25-May-2023
TRI-PARTY WELLS FARGO SECURITIES L	4.68	1,000,000,000.00	BRYJ22K94	5.02	25-May-2023	25-May-2023
TRI-PARTY CREDIT AGRICOLE CIB (NEW	2.34	500,000,000.00	BRYJ22J70	5.02	25-May-2023	25-May-2023
TRI-PARTY CITIGROUP GLOBAL MARKETS	0.47	100,000,000.00	BRYJ22J88	5.06	25-May-2023	25-May-2023

Source: https://www.blackrock.com/cash/en-us/products/329365/circle-reserve-fund

Opportunity to act as a stabilizing force?

Intermediation spreads in short-term funding markets are volatile

- GCF-Triparty repo spread: overnight repo lending financed by repo borrowing
- GCF-IOR spread: overnight repo lending financed by draining reserves
- FX IOR basis: overnight FX-swap dollar lending financed by reserves; o/n CIP deviation between interests on excess reserves between the Fed and ECB

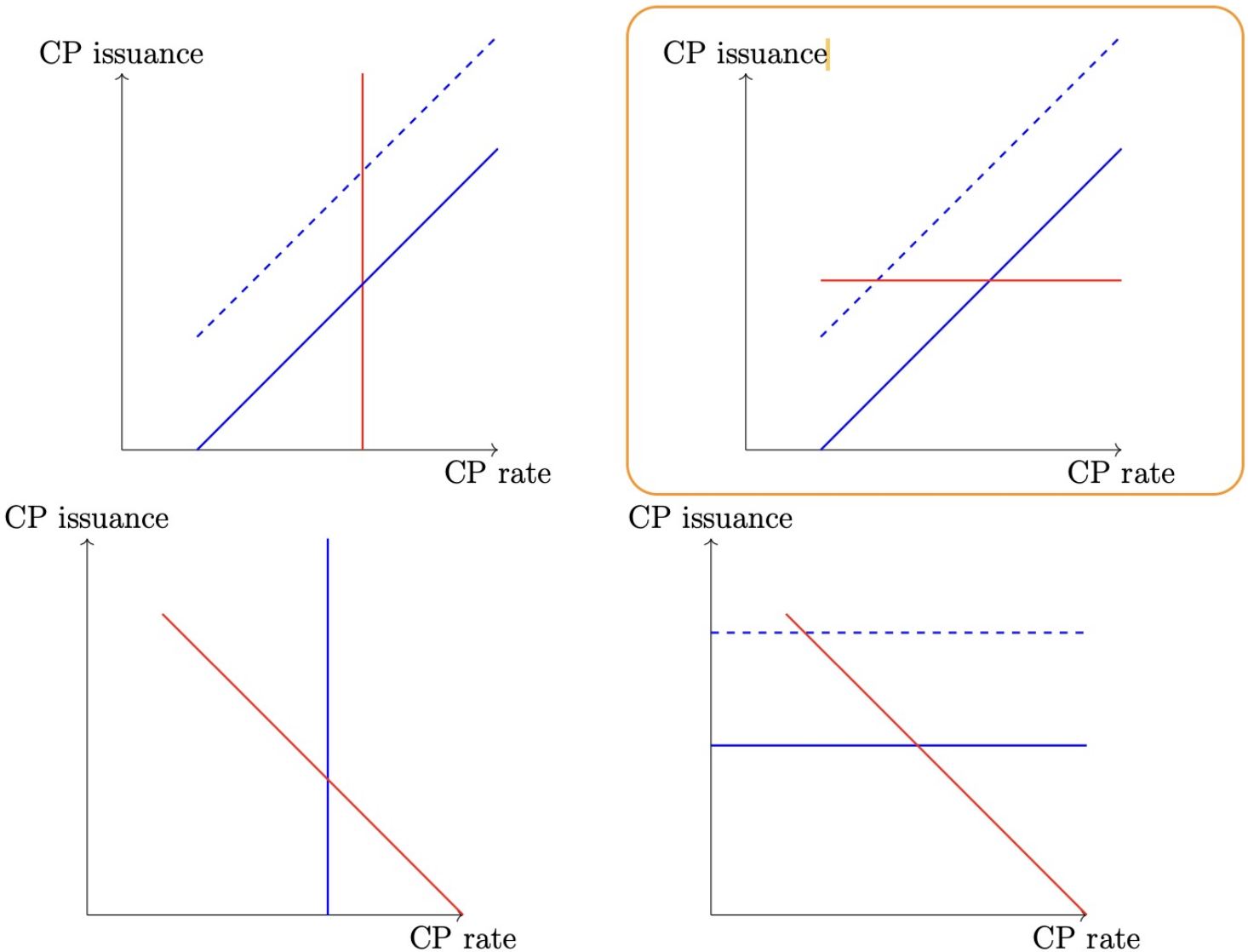


Correa, Du, Liao (2022)

Comment 3: Implications for digital token money design

What types of assets are optimal for backing?

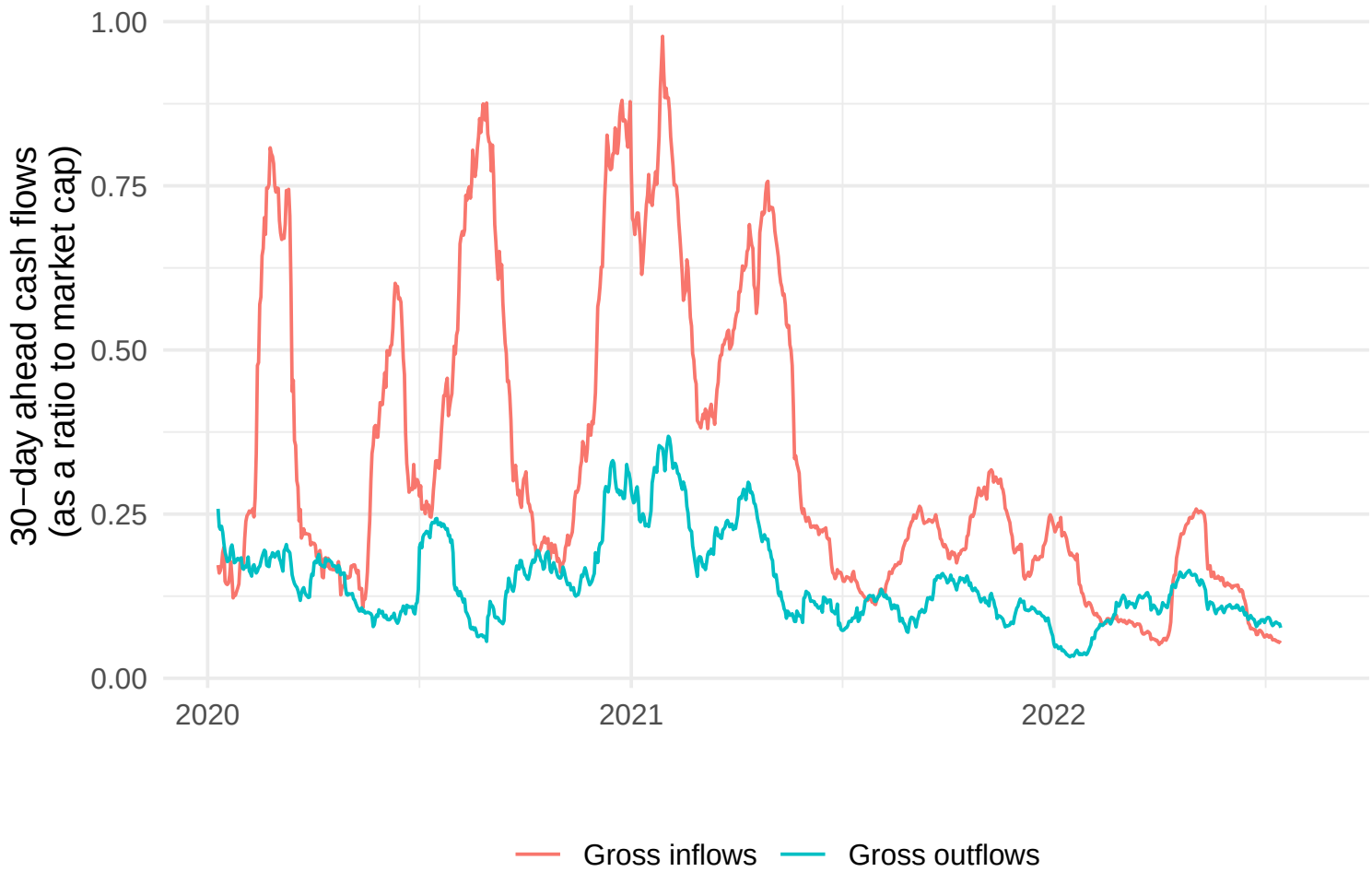
Figure 17: Impact of stablecoin demand on CP rate and issuance



Comment 3: Implications for digital token money design

Macroprudential considerations

Demand shifts in stablecoins can be large



Liao (2022)

Comment 3: Implications for digital token money design

Typical bank LCR requirements are insufficient to accommodate large demand shifts for tokenised liabilities

Table 4: Liquidity ratios

Assumption	**Run rate**	**Liquidity ratio**
Non-operational deposit run rate under Basel LCR	-40.0%	196%
Observed 30-day worst run rate with inflows capped at 75% of outflows	-9.2%	850%
Observed 30-day worst run rate with 0% inflow	-36.9%	212%
U.S. GSIBs' LCR average 2022Q2		118%

Notes: This table presents the liquid ratio of USDC calculated under different assumptions of run rates as of August 5, 2022. The calculation is based on the reserve as of August 5, 2022 and is broadly reflective of the general reserve mix of 80% T-bill and 20% cash deposits. The total circulation of USDC was $54.29 billion and the amount of HQLA consisting of Treasurys with less than 90 days of remaining maturity was $42.47 billion. The denominator is calculated as the run rate multiplied by the amount of USDC in circulation. Liquidity ratio is calculated as a ratio of HQLA to outflow according to Equation 1. The last row provides the LCR of the eight U.S. GSIBs based on their 2022Q2 public disclosures as a comparison.

Liao (2022)

Comment 3: Implications for digital token money design

Macroprudential considerations

- Optimal asset backing for digital token money needs to be
  - Liquid
  - With elastic supply curve
  - With little consequences to the real economy as demand shifts along supply curve
- Potential candidates for stablecoin backing:
  - ~~Loans (Tokenised bank deposits)~~: Inelastic supply, illiquid
  - T-bills: Deep liquidity, possibly need supply adjustments from the Treasury
  - Reverse repo: Deep liquidity, collateralized, supply curve locally elastic
  - Central bank reserves: Ultimate safe asset with elastic supply curve

Summary

- Great paper with important findings that can inform both our understanding of unsecured short-term funding market and stablecoin design
- Broader takeaways:
  - Supply elasticity of asset backing is important for stablecoin design
  - Stablecoin reserve can be designed to stabilize rather than destabilize funding markets
  - Short-term funding market is complicated, details matter for impact on real-economy versus financial arbitrage