Gauging the minimum ample quantity of reserves

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Based in part on research with Adam Copeland and Yilin Yang

Central banks are aiming for smaller long-run balance sheets

- A large balance sheet increases a central bank's footprint and the volatility of its income.
- But pressing the central bank's balance sheet down too far risks:
  1. ineffective monetary policy transmission.
  2. reputational costs.
  3. financial instability: cash hoarding, rollover risks for levered investors.

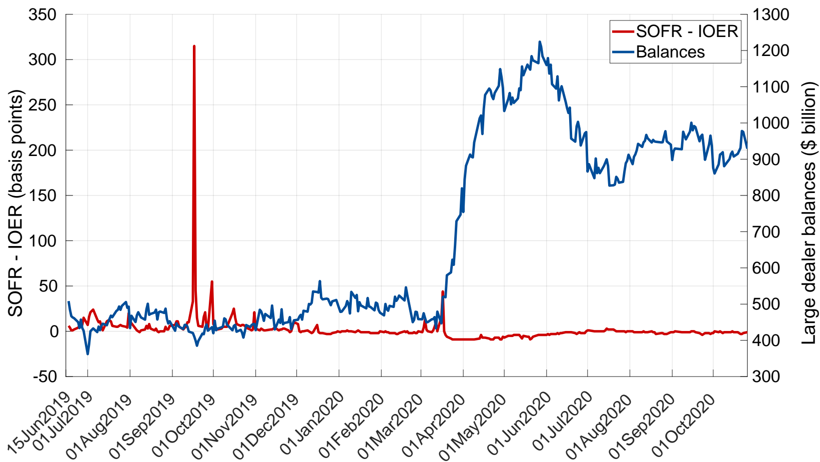


Figure: Copeland, Duffie, and Yang (2024). Right scale: The total reserve balances of the ten bank holding companies that are most active in repo markets (the "dealer banks"). Data: Fedwire Funds Service, FRBNY.

Achieving the minimum ample level of reserves is tricky

- Rate spreads are not a reliable gauge; they can spike unexpectedly.
- Structural changes make it hard to directly estimate the minimum ample level of reserves:
    1. liquidity regulations, stress tests, and discount-window policy.
    2. bank capital regulations.
    3. regulation of money funds.
    4. Ratchet effects in the demand for reserves (Acharya and Rajan, 2020).

Repo rates are elevated when dealer banks have low balances and are paid late

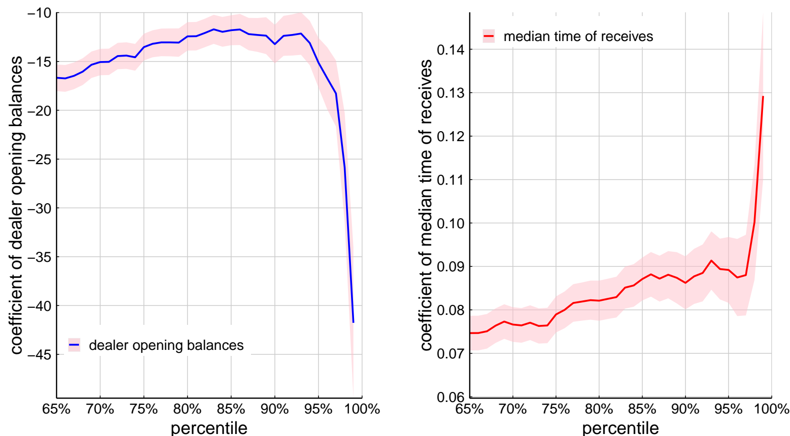


Figure: Coefficients for predicting quantiles of SOFR-IOR, in basis points with dealer-bank balances ($ trillions) and median time of received payments by the dealer-banks (minutes). Controls: stock of Treasuries outstanding, amount of Treasuries redeemed, amount of Treasury Bills issued, amount of Treasury Coupons issued, amount of uninsured deposits issued by the dealer banks, corporate tax flows to the Treasury, quarter-end fixed effect. Shaded regions are estimated one-standard-deviation error bands. Copeland, Duffie, and Yang (QJE, 2024). Data: Fedwire Funds Service.

The big dealer banks get paid later when other banks have lower balances

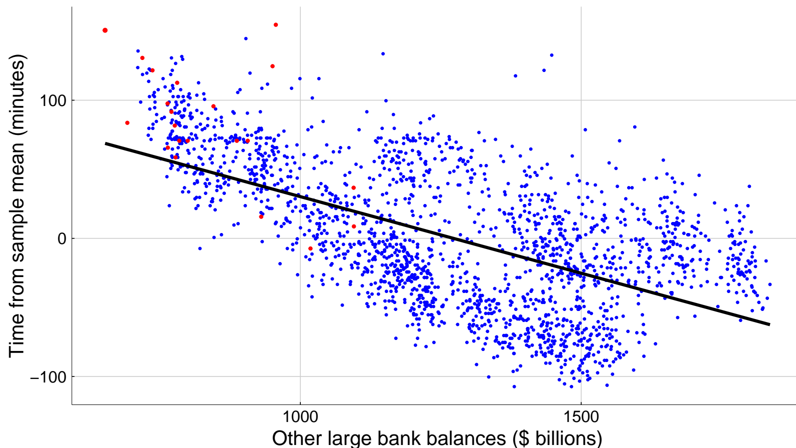


Figure: Time, relative to sample average, at which half of payments to the ten largest dealer banks is received from the next 90 largest banks, regressed on opening balances of next 90 largest banks. $R^2 = 0.69$. Red dots are days on which SOFR-IOR attained its highest 20 levels. Copeland, Duffie, and Yang (QJE, 2024).

Early warning sign: 10-day trailing average intra-day payment delays to the dealer banks

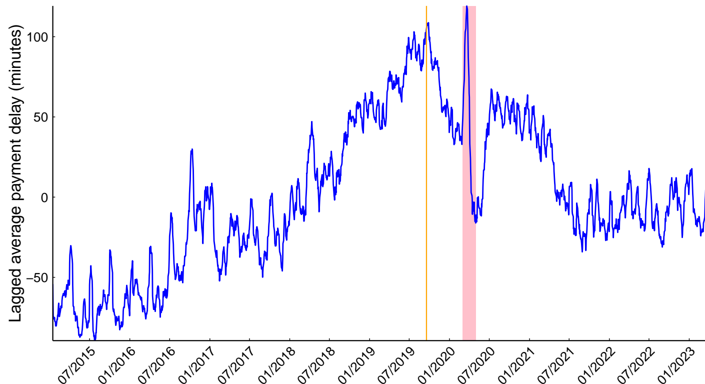
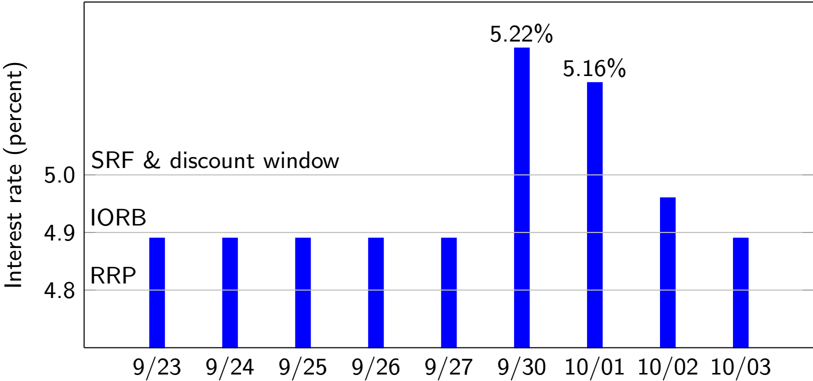


Figure: The lagged average of the time of day by which the ten largest repo-active bank holding companies had received half of their incoming payments, relative to sample mean, in minutes. The observation shown for date t is the average delay for business days $t - 10$ through $t - 2$ (inclusive). A vertical line is marked at September 18, 2019, the end of the three-day repo-market liquidity crunch of September 2019. A shaded bar marks the COVID shock period of March-April 2020. OLS regression: A one-standard-deviation increase in the trailing average payment delay predicts a 7-basis-point increase in SOFR−IOR. Copeland, Duffie, and Yang (QJE, 2024). Data: Fedwire Funds Service.

Repo rates jumped on September 30, 2024, when capital requirements hit non-US banks



GCF repo rates at end of 3rd quarter 2024. Data: FICC

The Treasury market is growing faster than its intermediation capacity

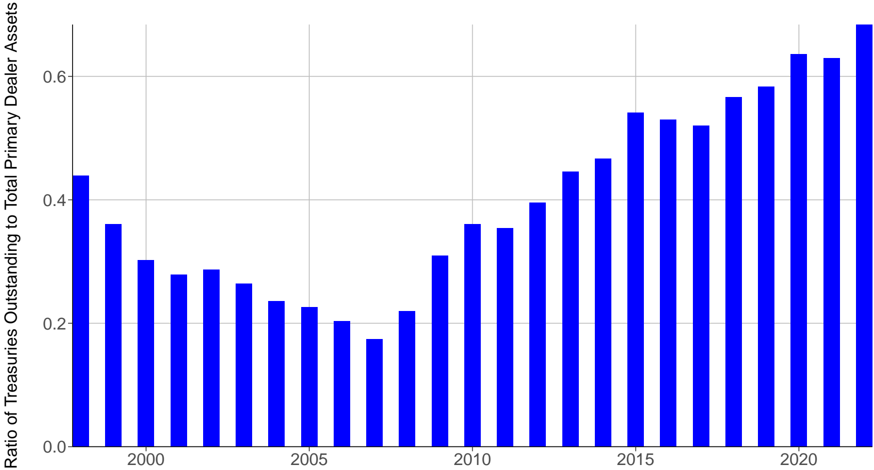


Figure: Updated from *Fragmenting Markets*, Duffie (2022).

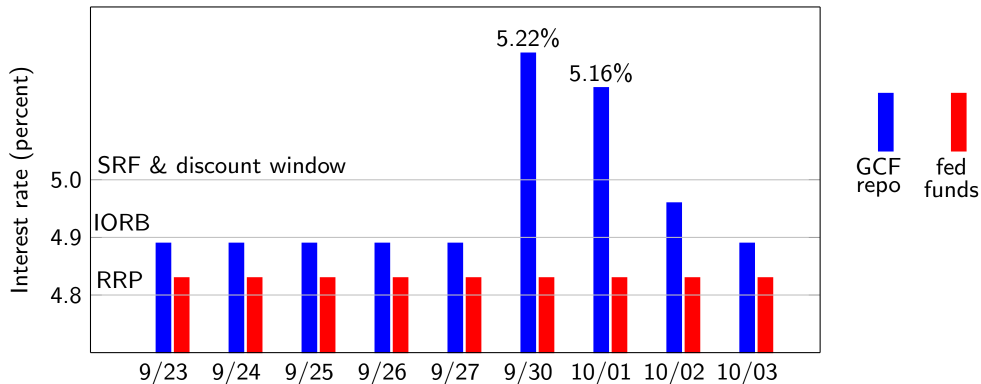
Ratio of primary-dealer gross positions and financing to the outstanding quantity of Treasuries

Figure: Treasury Borrowing Advisory Committee, October, 2024.

Using dealer balance-sheet space and the supply of reserves more efficiently

1. Update leverage-ratio capital requirements.
2. Central-bank financing facilities. Contingent or standing, broad or narrow?
3. Improved liquidity savings mechanisms for large value payment systems.
4. Intra-day repo markets, such as BNY's.
5. Central clearing of central bank repo operations.
6. Direct all-to-all markets.
7. Reducing the stigma of the Fed's Discount Window and Standing Repo Facility.

The September 30 repo crunch did not affect the fed-funds rate



Data: FRED and FICC

The repo market is the elephant in the room