The role of reserves in reshaping monetary policy implementation and interbank markets in the US

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The views presented here are solely those of the author and do not necessarily represent those of the Federal Reserve Bank of New York or the Federal Reserve System.
Reserves and interbank markets in the US

- Money markets have changed starkly over the past 15 years
  - Size, participants and interconnectedness

- Focus on interbank markets
  - Channel liquidity across the banking system
  - Setting of interest rate with the shortest maturity
  - Key role in monetary policy implementation

- Reserves play central role in monetary policy implementation and across money markets
Evolution of reserves in the US
Reserves balances

- Deposits that depository institutions maintain in their accounts at Federal Reserve Banks

- Level of aggregate reserves changes when
  1. Size of Fed balance sheet changes
  2. Composition of Fed balance sheet changes
Changes in reserves balances. An example

<table>
<thead>
<tr>
<th>Assets</th>
<th>Liabilities</th>
</tr>
</thead>
<tbody>
<tr>
<td>Securities 3,929</td>
<td>Reserves 1,896</td>
</tr>
<tr>
<td>Other 621</td>
<td>Currency 1,827</td>
</tr>
<tr>
<td></td>
<td>Treasury General Account 363</td>
</tr>
<tr>
<td></td>
<td>Other deposits 171</td>
</tr>
<tr>
<td></td>
<td>Other 294</td>
</tr>
<tr>
<td><strong>Total</strong> 4,550</td>
<td><strong>Total (Mar 18, 2020)</strong> 4,550</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Assets</th>
<th>Liabilities</th>
</tr>
</thead>
<tbody>
<tr>
<td>Securities 4,187</td>
<td>Reserves 2,187</td>
</tr>
<tr>
<td>Other 869</td>
<td>Currency 1,860</td>
</tr>
<tr>
<td></td>
<td>Treasury General Account 390</td>
</tr>
<tr>
<td></td>
<td>Other deposits 279</td>
</tr>
<tr>
<td></td>
<td>Other 341</td>
</tr>
<tr>
<td><strong>Total</strong> 5,057</td>
<td><strong>Total (Mar 25, 2020)</strong> 5,057</td>
</tr>
</tbody>
</table>
Changes in reserves balances. Another example

<table>
<thead>
<tr>
<th>Assets</th>
<th>Liabilities</th>
</tr>
</thead>
<tbody>
<tr>
<td>Securities 3,590</td>
<td>Reserves 1,457</td>
</tr>
<tr>
<td>Other 223</td>
<td>Currency 1,766</td>
</tr>
<tr>
<td></td>
<td>Treasury General Account 185</td>
</tr>
<tr>
<td></td>
<td>Other deposits 63</td>
</tr>
<tr>
<td></td>
<td>Other 343</td>
</tr>
<tr>
<td>Total 3,814</td>
<td>Total (Sept 11, 2019) 3,814</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Assets</th>
<th>Liabilities</th>
</tr>
</thead>
<tbody>
<tr>
<td>Securities 3,593</td>
<td>Reserves 1,394</td>
</tr>
<tr>
<td>Other 244</td>
<td>Currency 1,762</td>
</tr>
<tr>
<td></td>
<td>Treasury General Account 250</td>
</tr>
<tr>
<td></td>
<td>Other deposits 81</td>
</tr>
<tr>
<td></td>
<td>Other 349</td>
</tr>
<tr>
<td>Total 3,837</td>
<td>Total (Sept 18, 2019) 3,837</td>
</tr>
</tbody>
</table>
Pre-2008 financial crisis reserves

Reserve balances (2005-2008)
Pre-2008 financial crisis: A scarce reserves regime

◊ Reserves
  - Tens of $ billion
  - Not remunerated

◊ Demand for reserves
  - Meet reserve requirements: \( \frac{\text{Required reserves}}{\text{Total reserves}} > 80\% \)
  - Avoid overnight overdrafts

◊ Reserves traded in the interbank market

◊ Monetary policy framework
  - Corridor system (Poole (1968), Ennis and Keister (2008))
Implementation in a scarce reserves regime

“Reserves demand curve”
Fed funds market with scarce reserves

◊ Early literature

◊ Over-the-counter market
Pre-2008 fed funds market dynamics

◊ Active market
  - Daily volume $\sim$ 125-175 billion - Afonso and Lagos (2014)
  - Daily participants $\sim$ >100 - Afonso, Kovner and Schoar (2011)

◊ Intermediation

◊ Trading motives: insurance against liquidity shocks
  - Afonso, Kovner, and Schoar (2013)

◊ Resiliency in distress times
  - Afonso, Kovner and Schoar (2011), Kuo, Skeie and Vickery (2010)
From a scarce to an abundant reserves regime

Reserve balances (2009-2014)
Towards an abundant reserves regime

◊ Reserves
  - $ Trillion
  - \( \frac{\text{Required reserves}}{\text{Total reserves}} < 5\% \)

◊ Monetary policy framework
  - Floor system
  - New tools:
    * Interest on excess reserves (IOER) rate
      - Depository institutions
    * Overnight reverse repurchase agreement (ON RRP) rate
      - Depository institutions, government-sponsored enterprises (GSEs, including Federal Home Loan Banks), SEC-registered 2a-7 funds

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Implementation in an abundant reserves regime

In the flat region of the “reserves demand curve,” shifts in the supply of reserves no longer influence fed funds rates
Implementation in an abundant reserves regime
Fed funds market with abundant reserves

- Low daily volume $\sim$ $50-75$ billion - Afonso and Stern (2016)
  - No role for intermediation
  - Low bank-to-bank trading

- Few participants
  - Key role of Federal Home Loan Banks (FHLBs) $\sim$ $70-80\%$ lending

- Rates below IOER

- Arbitrage

  - Armenter and Lester (2017); Bech and Klee (2011), Schulhofer-Wohl and Clouse (2018); Banegas and Tase (2016); Keating and Macchiavelli (2017)
Exit strategy: Monetary policy normalization

◊ Discussions on exit strategy (2010-2011)

◊ Policy Normalization Principles and Plans (September 17, 2014)

- “When economic conditions and the economic outlook warrant a less accommodative monetary policy, the Committee will raise its target range for the federal funds rate. [...] the Federal Reserve intends to move the federal funds rate into the target range set by the Committee primarily by adjusting the interest rate it pays on excess reserve balances.”

- “The Committee intends that the Federal Reserve will, in the longer run, hold no more securities than necessary to implement monetary policy efficiently and effectively, and that it will hold primarily Treasury securities”
Exit strategy: Monetary policy normalization

◊ Lift-Off (December 16, 2015)

◊ Addendum to the Policy Normalization Principles and Plans (June 14, 2017)

> “Gradually reducing the Federal Reserve’s securities holdings will result in a declining supply of reserve balances […] to a level appreciably below that seen in recent years but larger than before the financial crisis; the level will reflect the banking system’s demand for reserve balances and the Committee’s decisions about how to implement monetary policy most efficiently and effectively in the future.”
Exit strategy: Monetary policy normalization

◊ Statement Regarding Monetary Policy Implementation and Balance Sheet Normalization (January 30, 2019)

- “The Committee intends to continue to implement monetary policy in a regime in which an ample supply of reserves ensures that control over the level of the federal funds rate and other short-term interest rates is exercised primarily through the setting of the Federal Reserve’s administered rates, and in which active management of the supply of reserves is not required.”

- “The Committee continues to view changes in the target range for the federal funds rate as its primary means of adjusting the stance of monetary policy.”
From an abundant to an ample reserves regime

Reserve balances (2015-2019)
Understanding demand for reserves

- New regulatory framework
- Internal liquidity-risk management
- Intraday payments
- Potential deposit outflows
- Absence of bank-to-bank interbank market

Duffie and Krishnamurthy (2016); Bech and Keister (2017); Ihrig, Kim, Kumbhat, Vojtech and Weinbach (2017); Logan (2019)
Implementation in an ample reserves regime

Afonso, Kim, Martin, Nosal, Potter and Schulhofer-Wohl (2020), Figure 5
Distribution of reserves matters

Afonso, Armenter and Lester (2019), Figure 8
Demand curve or demand curves?

Structural change in reserves demand curve?
Estimating demand for reserves over time

- Afonso, Giannone and La Spada (2020) (2010-2020)

Reserves demand curve (2010-2019)
Identifying ample reserves

◊ Balancing footprint vs. rate control and financial stability

◊ Operational implementation presents challenges
  - “Reserves-at-Risk” measures - Afonso, Giannone and La Spada (2020)

◊ Reserves no longer abundant
  - September 2019 money market disruptions
    - Afonso, Cipriani, Copeland, Kovner, La Spada and Martin (2020); Anbil, Anderson and Senyuz (2020); Schulhofer-Wohl (2019); Correa, Du and Liao (2020)
  - Increased coordination of payments
    - Afonso, Duffie, Rigon and Shin (2020)
From an ample to a super abundant reserves regime
Looking ahead

◊ Support US economy - FOMC statement (November 4-5, 2020)

- “The Federal Reserve is committed to using its full range of tools to support the U.S. economy in this challenging time”

- “over coming months the Federal Reserve will increase its holdings of Treasury securities and agency mortgage-backed securities at least at the current pace to sustain smooth market functioning and help foster accommodative financial conditions”

◊ Re-normalization?