Treasury Supply, Liquidity, and Bank Demand for Reserves

September 2018
Preview of conclusions

- Reserves are more abundant than the market thinks; large increases in Treasury supply will increasingly make reserves unattractive for banks as a source of HQLA.

- The upward drift in the federal funds rate is currently primarily a Treasury bill supply story rather than the result of reserve draining; this drift is poised to slow/stop as bill yields rise above IOER.

- Contrary to conventional wisdom, LCR and other end-of-day regulatory liquidity requirements are not the primary driver of bank demand for reserves; instead intraday liquidity needs and Treasury supply/demand dynamics will ultimately determine the desired level of reserves in the system.
Executive summary

HQLA composition at US banks (%)

Key drivers of HQLA mix

- Intra-day liquidity needs driven by payment activities
- Interest rate risk management considerations including risk preferences around
  - Duration
  - Convexity
  - AOCI volatility
- Relative pricing of HQLA
- Small differences in liquidity treatment of Treasuries and reserves for certain regulatory requirements including
  - NSFR: Treasuries have 5% required stable funding while reserves have zero
  - Testing of monetization assumptions for Treasuries
Treasury asset swaps and bills are close substitutes to reserves for LCR and have cheapened with Treasury supply

- Treasury asset swaps (buy Treasury note; pay fixed in swaps) have similar (~zero) duration to reserves but higher yields; their one downside is they have AOCI volatility when held in bank AFS portfolios

- Treasury bills yield modestly lower than IOR but the gap has narrowed with supply; further cuts in IOR and/or increases in bill supply may push bill yields above IOR

Yield pickup on 5 & 7-year US Treasury asset swaps vs. IOER (bp)

3M bill - 3M IOER* spread (bp) vs. Treasury bills outstanding ($bn)

Conclusion: Reserves are more abundant than the market thinks

* Expected 3M IOER derived from OIS forwards
Thus far, the increase in Fed funds effective relative to IOER appears almost exclusively a bill supply story with limited impact from reserve draining.

- FF-IOER spread well correlated with bill supply but largely uncorrelated with reserves

**Adjusted** FF-IOER spread (bp) vs. Treasury bills outstanding ($bn); monthly average, 9/16-9/18

**Adjusted** FF-IOER spread (bp) vs. level of excess reserves ($bn); monthly average, 9/16-9/18

* Partial regression plot where adjusted FF-IOER spread defined as FF-IOER+.0015*Excess reserves +51.5* IOER-target midpoint

**FF-IOER regression model; 9/16-9/18**

<table>
<thead>
<tr>
<th>Variable</th>
<th>Coefficient</th>
<th>T-stat</th>
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<tbody>
<tr>
<td>Intercept</td>
<td>-13.19</td>
<td>-3.32</td>
</tr>
<tr>
<td>Treasury bills outstanding</td>
<td>0.0075</td>
<td>8.88</td>
</tr>
<tr>
<td>Excess reserves</td>
<td>-0.0015</td>
<td>-0.99</td>
</tr>
<tr>
<td>IOER-target midpoint</td>
<td>-51.45</td>
<td>-4.47</td>
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R^2: 0.939  SER: 0.583
Intra-day liquidity requirements rather than LCR will determine the need for reserves

- Larger start-of-day reserve balances have reduced the volume of peak overdrafts
- Reduced risk of overdrafts has also reduced payment delays (throttling) by participants resulting in shorter timeframes during which participants carry a net debit intra-day

![Graph of Peak daylight overdrafts ($bn)](source: Federal Reserve)
The abundance of reserves is evident in the high fraction of payments made early in the day.

- Research by Bech, Martin, and MCAndrews highlights reduced throttling of payments and improved payments liquidity from more abundant reserves.

- One sign that reserves are becoming scarce is an increase in the fraction of payments made late in the day.

When will reserves become scarce? Three stages still ahead of us

- **Excess collateral dominates excess reserves**
  - Rising Treasury supply places upward pressure on Treasury bill yields, fed funds effective, and other short term rates relative to the target range

- **Reserves become more abundant**
  - As bill yields exceed IOER, banks are incented to replace reserves with non-reserve HQLA
  - This flattens the distribution of reserves in the banking system effectively making reserves more abundant
  - Increased opportunity costs of reserves also creates incentives for banks to become more efficient in the management of reserves
  - Bank demand for non-reserve HQLA should cause money market rates to stabilize relative to the target range despite ongoing Treasury supply increases and reserve declines

- **Reserves become scarce driven by intra-day liquidity needs**
  - Scarcity of reserves shifts the distribution of payments to later in the day making the payment system less efficient
  - Daylight overdrafts increase
  - Fed funds volumes increase driven by domestic banks borrowing above IOER
  - Difficult to predict what level this will occur at, but we expect reserves can fall well below $1 tn before reaching the steep segment of the reserve demand curve