July 20, 2018

Developments in the Federal Funds Market Following the Technical Adjustment to IOR[1]

The technical adjustment to the interest rate on reserves (IOR) in support of the Committee's increase in the target range worked exactly as expected – overnight funding rates across money markets rose roughly 20 basis points, in line with the 20 basis points increase in IOR. In the days following the hike, rates in the federal funds market rose a bit. Although these movements led some market commentators to suggest that the decline in the stock of reserves had begun to put upward pressure on overnight funding costs, the staff's assessment, based on detailed analysis of money markets data and information from market participants, is that other factors have been the most important drivers of dynamics this year.

Looking ahead, while staff does not see ongoing reserves reductions as likely to put significant upward pressure on federal funds rates and other money markets rates in the near term, there are a variety of other dynamics that could lead to further narrowing of the spread between IOR and the effective federal funds rate (EFFR). At some point an additional technical adjustment to IOR may be needed, though staff does not anticipate this will be the case anytime soon. The recent experience reveals that there may be some localized volatility in the EFFR that policymakers will want to look through.

Recent money market developments and lessons learned

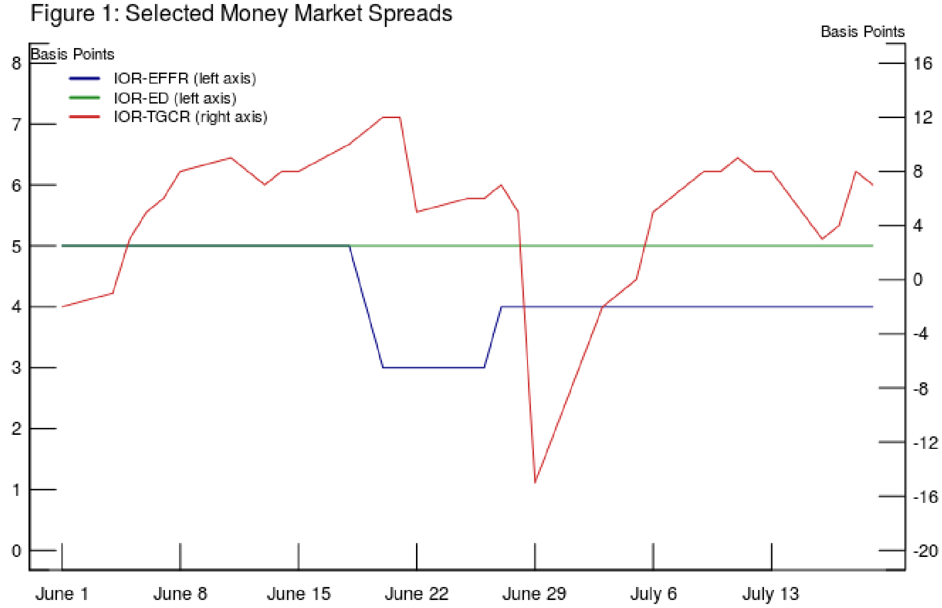
The day after the June FOMC meeting, when the Federal Reserve increased IOR by 20 basis points, median unsecured overnight funding rates, including both federal funds and Eurodollars, rose exactly 20 basis points; and, secured overnight rates, as measured by FRBNY's three repo reference rates, rose 19 basis points. The result, which was as expected, suggests that the current

[1] Board of Governors: Jeff Huther, Jane Ihrig, Soo Jeong Kim, Zeynep Senyuz; Federal Reserve Bank of New York: Adam Biesenbach, Ryan Bush, James Egelhof, Julie Remache, Will Riordan, Anna Tikonoff, Jacqueline Yen.

operating regime – that uses IOR and the ON RRP to set reservation rates in the market – remains highly effective at controlling short-term interest rates.

In the days following the initial increase, the EFFR rose a little more, with the IOR-EFFR spread narrowing from 5 basis points to 3 basis points before settling at 4 basis points (Figure 1). The increase in the EFFR was reportedly driven by a combination of temporarily greater demand from federal funds borrowers that are willing to pay up for funding that has favorable treatment under the Liquidity Coverage Ratio (LCR), as well as temporarily lower Federal Home Loan Banks (FHLBs) supply of such funding due to seasonal factors. These conditions proved to be transitory.

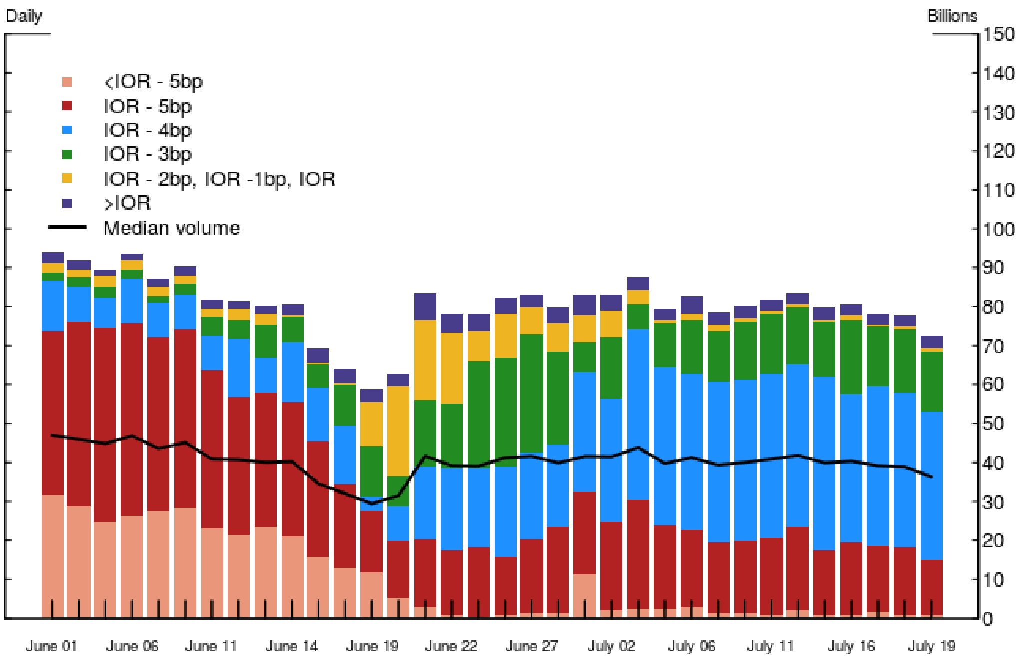
Figure 1: Selected Money Market Spreads



Note: All money market rates are calculated as volume weighted medians.
Source: Federal Reserve Board.

Specifically, a large custodian bank considerably increased its borrowing in the federal funds market and paid higher rates over these days. The bank reportedly experienced an unexpected outflow of LCR-favorable deposits and chose to replace the funding with federal funds borrowing from FHLBs, which also receives favorable LCR treatment. Competition for the remaining funds pulled up rates more generally with the ultimate outcome being a higher EFFR as can be seen in Figure 2. The figure shows that volumes at rates 5 basis points or more below IOR (the red and pink areas) fell in the days following the June FOMC meeting, while volumes at rates just 2 and 3 basis points below IOR (the green and yellow areas) increased. This caused the median rate (shown by the black line) to move to IOR minus 4 basis points on June 19 and then to IOR minus 3 basis points on June 20. On June 20, the custodian bank and another LCR-motivated bank accounted for 30 percent of federal funds borrowing and paid a rate of 1 basis point below IOR for these funds. Previously in June, these two institutions represented about 13 percent of borrowing on average and paid rates at or slightly above the EFFR. The custodian bank's LCR demand shock was temporary, and it resumed paying lower rates and borrowing smaller amounts a couple days later.

Figure 2: Distribution of federal funds volumes by rate bucket



Note: IOR is interest on excess reserves.
Source: Federal Reserve Board, Form FR 2420, Report of Selected Money Market Rates.

This increase in demand for LCR-friendly funding occurred together with a decline in the supply of such funding from the FHLBs. The supply of federal funds declined in mid-June before sharply rebounding, as FHLBs – whose lending accounts for over 95 percent of daily volumes – temporarily reduced lending (Figure 2). The fluctuations in the FHLBs' supply were driven largely by shifts in the size of the FHLBs' liquidity portfolios.[2,3] Importantly, as can also be seen

[2] The Federal Housing Finance Authority (FHFA) mandates FHLBs to maintain liquidity portfolios, largely determined by the size of their balance sheets. FHLBs currently invest that portfolio predominantly in federal funds and repo (see Slide 16: http://www.fhlb-of.com/ofweb_userWeb/resources/fhlbankpresentation.pdf). For additional background on FHLB liquidity portfolio management see the MarketSOURCE piece "Primer: FHLB Liquidity Management and its Impact on the Fed Funds Market."

in Figure 2, it is worth pointing out that from June 18 to June 27 the median rate was right at the cusp of two different rate levels, meaning that a very small change in trading activity on those days could have resulted in the EFFR printing at a lower or higher rate level.

Over the period when the EFFR increased and then decreased, Eurodollar rates were stable. This divergence between the medians of the two rates is consistent with a differential treatment of unsecured overnight loans based on lender type in LCR regulations. Unlike federal funds borrowing from FHLBs, which has a 40 percent runoff assumption under the LCR, about 80 percent of borrowing in the Eurodollar market is from non-bank financial firms; these liabilities receive a 100 percent runoff assumption under the rule. While there is some evidence of a small LCR premium in the federal funds market for selected institutions at some select periods, it has not been pervasive at this point as only a few, albeit at times large, borrowers currently appear to be LCR focused. Finally, the LCR driven borrowing in the federal funds market has no effect on the much larger secured overnight markets.

Looking ahead over the next several months

The evolution of the EFFR is likely to be influenced by a variety of factors, several of which were described in an April memo to the Committee.[4] Staff expects that these factors will likely, on net, exert further upward pressure on the EFFR toward the IOR rate over the next few months without pushing the EFFR above the target range:

- **Higher Treasury bill issuance.** Staff expects net Treasury bill issuance to fluctuate over the next six months, with net issuance during the fourth quarter expected to be close to $100 billion. These increases in net issuance are likely to exert upward pressure on bill and repo rates, but not to the extent observed earlier in the year when net issuance was over $300 billion.

[3] Depositor withdrawals around the mid-June tax season reportedly led domestic banks to increase their borrowing in FHLB advances to bolster funding. To meet the increased demand for advances, FHLBs used their liquidity buffers to provide advances to their members, thereby reducing the volume of federal funds available. Also, some FHLB contacts reported reducing their federal funds volumes due to a narrower spread between overnight discount note (DN) rates and the EFFR. Part of FHLB demand to lend federal funds is driven by a relative value trade where an FHLB borrows through an overnight DN and lends the proceeds in federal funds.
[4] See the April 20, 2018 FOMC memo, “The Effective Federal Funds Rate and the Target Range.”

- **Changes to FHLB liquidity portfolios.** The EFFR could also be affected by prospective, not yet public changes the Federal Housing Finance Agency (FHFA) is planning for the FHLBs' liquidity framework, which the FHLBs will need to comply with by end-2019. The adjustments that FHFA is contemplating could have countervailing effects on FHLB activity in the federal funds market: on the one hand, the changes will increase the FHLBs' liquidity requirements, but on the other, the changes will allow for a broader range of investments, including Treasury securities with up to 10 years remaining maturity.[5] The FHFA does not expect significant changes by the FHLBs in the federal funds market in the near term with respect to the changes in the liquidity framework, estimating that even if the FHLBs shifted their liquidity portfolios towards Treasury securities, they would likely maintain sizable investments in federal funds to meet early-day liquidity needs. That said, apart from potential regulatory changes, FHLBs have recently begun investigating options for increasing their capacity to lend in repo markets, including both triparty and DVP repo, to take advantage of higher repo rates which would as we saw in recent months serves to reduce federal funds activity levels.[6]

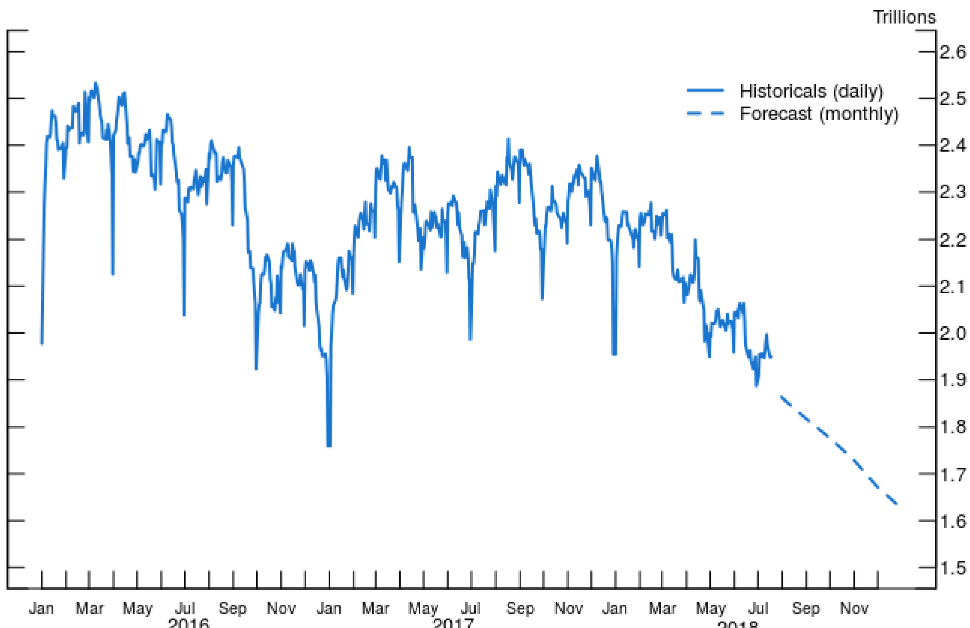
- **Removal of FDIC assessment fee.** By the end of the year, the FDIC will remove a 4½ basis point assessment surcharge imposed on large domestic banks that could create upward pressure on rates by reducing balance sheet costs. It is expected that the impact would be small as large domestic banks generally did not participate in the federal funds market before this surcharge was imposed in March 2016, and they would still face balance sheets costs that may make IOR arbitrage unattractive at current rates.

[5] A more technical aspect of the change would consider exempting Treasury security holdings from the "core mission" asset requirements. Under this requirement, an FHLB's "core mission" assets related to supporting the housing market have to be equal to or greater than a percentage threshold. While federal funds lent lower the core mission asset ratio, by exempting Treasury securities from this requirement the FHLBs could hold more of these securities without being constrained by the overall size of their business.

[6] DVP, or delivery versus payment, repo transactions involve settlement taking place outside of the triparty repo infrastructure, allowing for more flexible settlement timing. The cash lender – in this case, an FHLB – can return the collateral underlying the repo early the following day, providing them with earlier access to their cash. Importantly, since DVP repo allows for early-day liquidity it may be a closer substitute to federal funds loans. However, DVP is also operationally more intense and it is not clear whether there is additional market capacity for FHLB lending.

- **Reduction in reserves.** Staff projections suggest that reserve balances will decline by an additional $300 billion over the course of 2018, with the level of reserves standing at around $1.6 trillion at year-end (see Figure 3). Staff expects only a small amount of upward pressure on the EFFR relative to the IOR rate stemming from the reduction in reserves since the stock of reserves will remain quite large. However, as reserve balances progressively move to lower levels, daily volatility in the level of reserves and any associated changes in federal funds rates may become increasingly important to monitor. Since 2017, the 1st percentile of daily changes has been a $95 billion decline and the 99th percentile has been a $65 billion increase, and on a daily basis reserves levels are projected to fluctuate in both directions. The large daily changes since 2017 and in projections going forward are mainly due to seasonal fluctuations in Treasury's balances held at the Federal Reserve.

Figure 3: Historical and Projected Reserves



Source: H.4.1 and staff forecast.

Conclusion

On balance, the staff anticipates that the current framework for policy implementation will continue to be highly effective in managing federal funds rates and other short-term rates this year. As noted above, there are a number of possible factors that could affect the federal funds market and the level of the EFFR over time. However, these risks generally appear to be manageable and if needed could be addressed with another technical adjustment to IOR. That said, staff will continue to monitor developments in the federal funds market closely for any signs of changes that could have significant implications for policy implementation. While new risks may emerge, others such as lower volumes in the federal funds market stemming from a significant shift in FHLB liquidity management have been known for some time, and the possibility of expanding the set of transactions underlying the EFFR to include those in the OBFR has been raised before.[7]

Developments in the federal funds market in June and over recent months highlight a key challenge associated with understanding and interpreting developments in money markets in real time. Although the system for policy implementation is working very well, federal funds rates and other short-term rates can be affected at times by a range of idiosyncratic or temporary factors. Distinguishing between movements in federal funds rates that are attributable to such factors versus those that may reflect the ongoing balance sheet normalization may not always be easy, especially in real time. Indeed, during the most recent episode, some market participants attributed some of the movements in federal funds rates to the decline in the level of reserves. As noted in the memo, staff outreach and analysis pointed to other factors as the key factors driving federal funds rates movements in June. Looking ahead, assessing the market effects of ongoing balance sheet normalization and reserves reductions will require careful review of data and market developments in order to separate the "signal" regarding the effects of declining reserves from the "noise" of movements in federal funds rates that can arise from many other factors.

[7] The OBFR has been identified in past work as a workable back-up rate and was designed with this back-up purpose in mind. The OBFR – which consists of federal funds and Eurodollar transactions – has, to date, been very highly correlated with EFFR, suggesting that its use would not require any significant adjustment to the public's understanding of the FOMC's reaction function or to the FOMC's monetary policy communications. The EFFR could be administratively redefined to include some or all of the underlying transactional data that now make up OBFR. There are various legal, operational, macroeconomic and communications issues associated with such a change, and additional investigation would need to be done to assess these risks. See the April 2014 FOMC memo "Potential Issues for the Federal Funds Market."