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Municipal Bond
Management

Education Series

FAQ: What's Next for Fed Monetary
Policy Tools in a Period of High
Liquidity?

December 2015

Summary

The massive increase in liquidity in the financial system resulting from three rounds of Quantitative Easing (QE) has significantly altered the manner in which the Federal Reserve (Fed) will be able to implement monetary policy tightening. While in the past the target federal funds rate could be manipulated with relative ease, the Fed now requires new and expanded tools for affecting a rate change. We think that these changes are essential for investors to understand, as they may have significant influence on short-term interest rates in the broader market. Instead of targeting an increase of 25 bps in the federal fund rate (as it had prior to the financial crisis) the Fed will now set a 25 bp-wide target range for the effective federal funds rate (EFFR), with the rate of interest on excess reserves (IOER) set at the top of the range and the rate on overnight repurchase agreements (ON RP) targeted at the bottom of the range.

To provide insight into the evolution of the Fed's monetary policy from pre-crisis to today, as well as to discuss the efficacy and risks associated with the Fed's new toolbox of policies, our report addresses the following "Frequently Asked Questions":

- How effective will the Fed be at dealing with changing demand in the repo market?
- What if the Fed institutes a cap on repos too quickly?

As the Federal Reserve (Fed) now seems poised to raise its target for the federal funds rate for the first time since 2006, many find themselves wondering what will happen when the Fed ultimately raises short-term interest rates. Having begun to use "unconventional" monetary policy in the last stages of the U.S. financial crisis of 2007-2008, the Fed's most notable tool – Quantitative Easing (QE) – was implemented over the course of roughly five years as the Fed purchased long-term Treasuries and mortgage-backed securities in an effort to bring down long-term interest rates and stimulate the economic growth

Some many expect that pre-crisis monetary policy remains a viable option for the Fed now that the economy is back on stable footing and the final QE program has been expired for more than a year; however, the increased liquidity that resulted from the use of this unconventional tool has necessitated a significant change in the practical implementation of conventional monetary policy. In particular, the financial crisis and the \$3.5 trillion of asset purchases during QE has heled to inflate the amount of excess reserves at depository institutions in the U.S. from \$2 billion to more than \$2.5 trillion. Notably, the Fed must now rely on both a greatly expanded volume of transactions in the market for repurchase agreements and the rate of interest on excess reserves in order to enforce its target for the federal funds rates going forward. Recognizing that the Fed's ability to enforce

this target will significantly influence other short-term rates in the market, we believe it is imperative to understand the tools now at the Fed's disposal—especially given that interest rates on short-term assets will not behave as they otherwise would in a typical tightening cycle if the Fed is unable to effectively use its newly expanded toolbox.

In order to shed light on how the dramatic increase in excess reserves will impact the way the Fed conducts monetary policy going forward, and to discuss the risks associated with this new methodology, we have prepared the following report of Frequently Asked Questions.

Pre-Crisis Monetary Policy

What were the pre-crisis market conditions for monetary policy?

Prior to the financial crisis, the Fed dictated monetary policy by setting a target federal funds (or fed funds) rate which the Fed believed would best achieve its dual mandate of: 1) low, stable inflation and 2) full employment. In general, economic activity and the Fed's target rate were proportionally related as the Fed would respond to a weak economy by lowering its target rate and to an overheating economy by increasing its target rate. In doing so, the Fed effectively changed the price at which firms and consumers borrow money given that the target fed funds rate has historically been highly correlated with other short-term interest rates and financial institutions pass on short-term interest rates changes to other firms and consumers, thereby impacting the amount of investment and consumption in the economy.

Banks' required reserves were the key to traditional monetary policy. Banks short on reserves were forced to borrow money in short-term lending markets to meet the reserve requirement, resulting in lower supply and higher demand for capital that drove the EFFF higher. In contrast, banks with sufficient reserves helped to drive the EFFF lower.

Excess Reserves:

The amount of reserves held by banks, in excess of the legally mandated required reserves.

Effective Federal Funds Rate (EFFR):

The rate at which banks engage in overnight, uncollateralized lending with each other. The Fed sets a desired range for this rate as its primary monetary policy target.

Required Reserves:

The legally mandated amount of reserves (as a percentage of their total assets) that banks must hold.

How was pre-crisis monetary policy implemented?

Of course, having a target rate is not the same as actually being able to enforce it. The daily average rate at which eligible institutions lend to another in the fed funds market is known as the effective fed funds rate (EFFR). The idea that the Fed sets the EFFR itself, with the legal ability to determine the rate at which banks lend to each other, is a common misconception. The EFFR is instead determined by supply and demand for fed funds, which is generated by banks' reserve requirements. Banks short on reserves were

forced to borrow money in short-term lending markets to meet the reserve requirement, resulting in lower supply and higher demand for capital that drove the EFFR higher. In contrast, banks with excess reserves helped to drive the EFFR lower.

Therefore the Fed could only indirectly influence the EFFR via its ability to alter banks' incentives for borrowing or lending. By making other short-term assets more or less attractive, the Fed could incentivize banks to buy more or fewer of these short-term assets rather than holding excess reserves.

The Fed's most commonly used tool for altering bank reserves was the overnight repurchase (or "repo") agreement. By either lending or borrowing in the repo market (the borrower is said to engage in a "reverse repo"), the Fed was able to influence the interest rate on repos (known as the "repo rate"). In doing so, the Fed made repos more or less attractive to financial institutions and indirectly impacted financial institutions' levels of reserve held. With total excess bank reserves of less than \$3 billion for the entire banking system prior to 2007, the amount of Open Market Operations (OMO) needed to change the EFFR was quite manageable at \$2-20 billion per week.¹ For most of the pre-crisis period, this system worked so well that the Fed made very few changes to its tactic for implementing monetary policy in the several decades leading up to the financial crisis.

¹ Federal Reserve Banks of New York. "Temporary Open Market Operations Historical Search", <https://apps.newyorkfed.org/markets/autorates/tomorrow/search-page>. Accessed 12/7/15

Post-Crisis Monetary Policy

What are the post crisis market conditions for monetary policy?

For policy makers, the greatest difference between the pre- and post-crisis periods is simple: market liquidity. The dramatic increase in market liquidity post-crisis can be attributed to two developments during and following the financial crisis. First, as the crisis unfolded, commercial banks became increasingly hesitant to lend money in a weakening economy and reticent to offer interbank loans to one another (causing the Fed to step in to provide liquidity), choosing instead to simply hold cash as reserves. Second, as a result of the purchases of long-term Treasury and mortgage-backed securities during QE, the Fed expanded its assets from \$905 billion in September 2008 to approximately \$4.5 trillion in December 2015.²

Both of these factors contributed to a significant increase in the excess reserves in the banking system from about \$2 billion to over \$2.5 trillion as of October 2015, representing a more than 1000-fold increase.³ While the Fed has not increased its balance sheet since August 2014, it continues to reinvest principal from any bonds that are redeemed – maintaining the unprecedented amount of liquidity in the banking system for foreseeable future.⁴

² Federal Reserve Bank of St. Louis Economic Research.

<http://research.stlouisfed.org/fred2/series/WALCL>. Accessed 12/7/15

³ Federal Reserve Bank of St. Louis Economic Research.

<http://research.stlouisfed.org/fred2/series/EXCSRESNW>. Accessed 12/7/15

⁴ Minutes of the Federal Open Market Committee, Sept. 16-17, 2015.

<http://www.federalreserve.gov/monetarypolicy/files/fomcminutes20150917.pdf>. Accessed 12/7/15

Though financial conditions have otherwise returned to normal, the vast increase in banks' excess reserves has eliminated the need for banks to borrow in short-term markets to meet reserve requirements, and furthermore, increased market liquidity in the banking system has significantly increased the volume of trading in the repo market. Going forward, financial institutions can still be expected to participate in the repo and fed funds markets to maximize profits, and with so much cash held by banks, the amount of capital available for use in the repo market far exceeds pre-crisis levels. Therefore, if the Fed returned to pre-crisis borrowing and lending levels in the repo market, it would likely have a muted effect on the repo rate. In order to exert some control over the repo rate (and therefore on the EFFR), the Fed must now be willing to borrow or lend a much larger amount of capital.

How will post-crisis monetary policy be implemented?

In order to significantly increase the volume of capital it trades in the repo market in order to achieve its policy goals, the Fed plans to make two main adjustments going forward as it looks to increase its EFFR target range in 25-basis point (bp) increments, with the expectation that the first hike will raise the new range from 0-25 bps to 25-50 bps.⁵

- The Fed is prepared to significantly increase borrowing in the repo market. Notably, over the last 2 years, the volume of daily repo OMO has risen to approximately \$300 billion⁶. Given the

Overnight Repurchase Agreement (Repo):

A temporary form of Open Market Operations by which any parties (not just financial institutions eligible for fed funds) can create an overnight loan collateralized by Treasury securities, Agency securities, or mortgage-backed securities.

Open Market Operations (OMO):

Traditionally the Fed's primary monetary policy tool, in which the Fed buys and sells government securities in the open market in order to increase or decrease the amount of money in the banking system, in order to adjust the fed funds rate.

Rate on Overnight Repurchase Agreements (Repo Rate):

The rate at which parties engage in overnight collateralized loans, typically secured by short-term Treasury bills. This represents the lowest rate at which banks will lend, and will be used by the Fed to set a floor under EFFR.

Interest on Excess Reserves (IOER): The rate of interest that banks earn on excess reserves. The Fed will use this to set a ceiling on EFFR.

amount of cash that can be moved into the repo market, the Fed must also be able to change its level of reverse repos by potentially billions of dollars each week. The Fed will use OMO to keep

⁵ Minutes of the Federal Open Market Committee, Sept. 16-17, 2015. <http://www.federalreserve.gov/monetarypolicy/files/fomcminutes20150917.pdf>. Accessed 12/7/15

⁶ Quarterly Report on Federal Reserve Balance Sheet Developments, November 2015.

http://www.federalreserve.gov/monetarypolicy/files/quarterly_balance_sheet_developments_report_201511.pdf

the repo rate ((which has tended to fluctuate between 3-5 bps since December 2013, when the Fed greatly expanded its number of transactions in the repo market) near the bottom of the range.

- As OMO could prove difficult to calibrate, the Fed will also rely on a new tool added to its repertoire during the crisis: interest on excess reserves (IOER). As experience with IOER has shown, this rate has been above the EFFR due to the regulatory fees that banks incur from holding reserves⁷. The Fed will use the IOER ((currently set to 25 bps) as the top of its target range

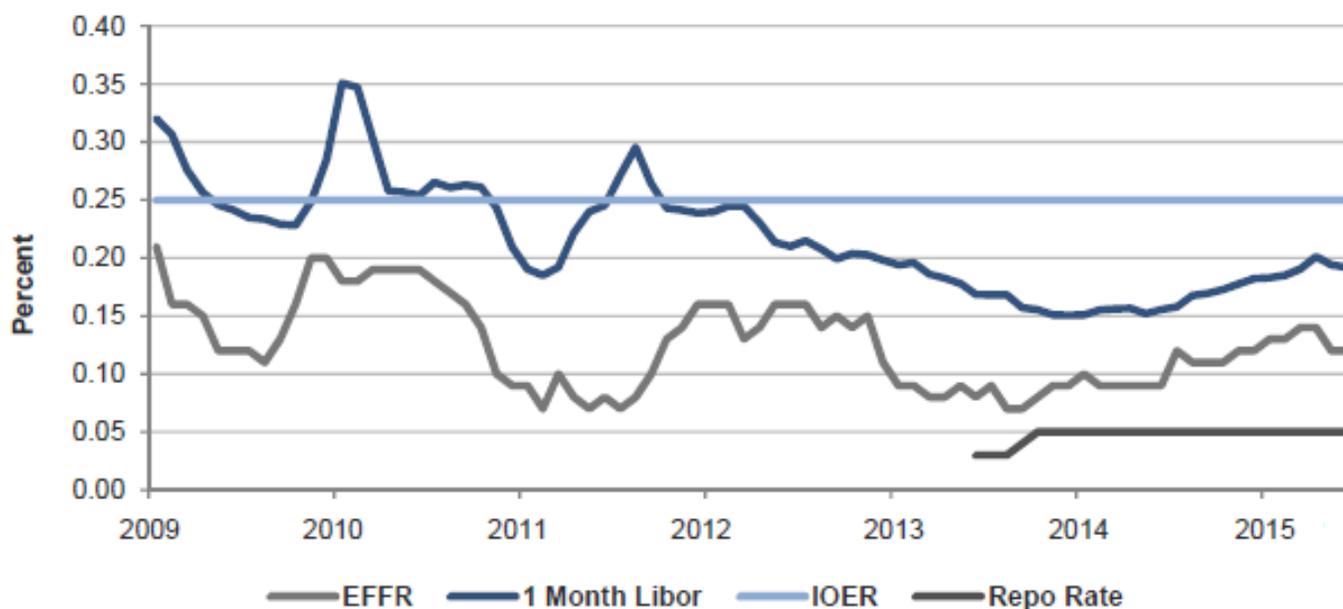
As shown in Figure 1, the EFFR has fluctuated between 4 bps and 23 bps in the post-crisis era, with the IOER acting as a ceiling on the EFFR since 2010. In terms of the repo rate, the Fed typically participated in less

than \$110 billion in repos each day prior to December 2013 -- exerting little influence on the repo market and therefore little influence on the EFFR -- but has since expanded to accommodate between \$100-\$300 billion in repos, much more effectively creating a lower bound for the EFFR. As such, the below graph only includes repo rate data post-December 2013 to better highlight the reverse repo rate's effectiveness in setting a floor for the EFFR⁸.

Lingering Questions for the Efficacy of The Fed's New Approach

How effective will the Fed be at setting a floor for the first time?

In the post-crisis period, there has been little concern about the Fed's ability to maintain a floor under the



Source: St. Louis Federal Reserve FRED database.

⁷ Gagnon, Joseph E., and Brian Sack. Monetary policy with abundant liquidity: a new operating framework for the Federal Reserve. Peterson Institute for International Economics, 2014.

⁸ Temporary Open Market Operations Historical Search, <http://apps.newyorkfed.org/markets/autorates/tomo-results-display/> Accessed 12/7/15

EFFR because the bottom end of the range has been 0 bps and banks are unwilling to lend at a negative rate (implying that a bank would pay another bank to hold its money) under normal circumstances. However, when the target range is raised to 25-50 bps, the nominal zero lower bound constraint will cease to provide a floor for the EFFR without any help from the repo rate, so only the repo OMO will be in place to set a floor.

How effective will the Fed be at dealing with changing demand in the repo market?

To ensure enough flexibility to deal with changing demand in the repo market, the Fed plans to accommodate an unlimited amount of repo transactions. For as long as the cap is lifted, this should guarantee that the repo rate will in fact form a floor under the EFFR. However, there has been a fair amount of dissent within the FOMC on this point, with some members suggesting that an unlimited repo facility could be disruptive to “patterns of financial intermediation”⁹. Vague as this may be, some FOMC members do seem to be in favor of reinstating a cap on the quantity of repos at some point in the tightening cycle, which could potentially challenge the Fed’s control on the floor under short-term rates.

What if the Fed institutes a cap on repos too quickly?

One can imagine a situation over the next few years in which the Fed returns to a \$300 billion cap in repo OMO and chooses to hike the target range by 25 bps to something like 1.25% - 1.50%. Rather than pushing up short-term rates by 25 bps (as intended by the rate

hike), the EFFR might stay below the range at 1.15% if the quantity of reverse repos made available by the Fed is not enough to meet market demand. While many investors would have expected the rate hike to result in an approximately proportional increase in the EFFR (and therefore other short-term rates), the actual increase in rates would fall well short of the 1.25% lower end target. In fact, a rate hike in such a scenario might result in no change whatsoever to short-term interest rates. The extremely high quantity of liquidity in the financial system has created this possibility, and it requires close attention from investors as the Fed adapts to the new monetary policy environment.

Conclusion

When the Fed decides to raise interest rates for the first time since 2006, the tools used to achieve policy goals will have changed substantially in the wake of the financial crisis. Although conventional monetary policy is a much more difficult task in the wake of the Fed’s significant balance sheet expansion and the banking system’s unprecedented growth in excess reserves, the Fed hopes to maintain the EFFR within a 25-bp range (with bounds subject to change over time) by setting the IOER as the top of the target range for the EFFR, and by engaging in OMO to set the rate on repos at the bottom of the range.

As the use of a target range rather than a target rate may indicate, the more than 1000-fold increase of excess reserves in the financial system since the financial crisis has created a greater margin of error around the Fed’s ability to influence the EFFR. With so much liquidity in the system, the Fed must participate in a far greater amount of reverse repos to

⁹ Minutes of the Federal Open Market Committee, January 27-28, 2015, <http://www.federalreserve.gov/monetarypolicy/files/fomcminutes20150128.pdf>

influence the repo rate, and the daily transactions will likely increase from \$2--20 billion pre-crisis to upwards of \$300 billion. This scope of funds needed to move the repo rate and the fact that the Fed has never hiked rates from zero before creates considerable uncertainty regarding the efficacy of the repo rate to set a floor on rates. Since rates on short-term T-bills, discount notes and municipal bonds are highly correlated with the EFFR, we will continue to monitor developments in the repo market and gauge how effectively the Fed is managing downside risks to the EFFR.

Please feel free to contact us at research@gurtin.com for additional information.

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