

SPEECH

## Implementing Monetary Policy Post-Crisis: What Have We Learned? What Do We Need to Know?

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I would like to welcome you to this workshop, organized jointly by the School of International and Public Affairs at Columbia University and the Federal Reserve Bank of New York. We have assembled an excellent set of presenters and discussants focused on the topic of implementing monetary policy post-crisis, who are here to ask important questions such as what have we learned from our experience and what do we need to know going forward? I am expecting an active and stimulating dialogue on a range of topics. As always, these remarks are my own and do not necessarily reflect the views of the Federal Reserve Bank of New York or the Federal Reserve System.<sup>1</sup>

As most of you know, the Federal Reserve System is engaged in an extended effort to evaluate potential long-run monetary policy implementation frameworks.<sup>2</sup> There are many reasons to take a close look at the issues now. For example, the Federal Reserve has new tools, like the authority to pay interest on reserves and reverse repurchase agreements with an expanded set of counterparties, which were not available pre-crisis.<sup>3</sup> The money markets in which the Trading Desk of the Federal Reserve Bank of New York (the Desk) operates have different dynamics than before, in part because of our large-scale asset purchases. We want to take stock of these changes and ask ourselves what the best way of implementing monetary policy is today and in future environments in a manner that is consistent with the Federal Reserve's normalization principles.<sup>4</sup>

To make good choices about the monetary policy implementation framework going forward, it is, of course, useful to learn from the past. Our task is to assess the strength and weaknesses of existing and previous frameworks, particularly through the lens of what happened during the recent global financial crisis, when central banks were called on to innovate in a number of ways. In addition, the varied experience of other central banks prior to the crisis can also provide valuable insights. What have they learned about what worked well, or did not work so well, with their frameworks?

The current framework in the United States looks very different than the pre-crisis framework. One way in which it is different is that excess reserves are much higher than they used to be. This shift is due, in large part, to the large-scale asset purchases that the System undertook, starting in December 2008. But, if you look closely, you'd see that excess reserves actually started expanding earlier and control of the federal funds rate deteriorated.<sup>5</sup> So what happened?

In reviewing the events of the second half of 2007 and most of 2008, it is clear that the Federal Reserve faced a tension between the need to provide liquidity to ease money market strains and the need to keep control of the interest rate target within its earlier framework. Demand for dollar liquidity increased in many money markets and some of that demand came from banks headquartered outside of the United States. A by-product of the Federal Reserve's efforts to provide liquidity to the financial system is that the supply of reserves, which can only be held by banks, increased. Reducing money market strains may require injecting more reserves than banks want to hold at the target rate, creating an excess that can lead to a decrease in interbank money market rates. This tension is a potential feature of implementation frameworks that rely on scarcity of reserves. If reserves become less scarce, and if you cannot pay interest on reserves, you will lose control of the interest rate that you are trying to steer. Francesco Papadia's presentation later today will illustrate some of the flexibility that the European Central Bank (ECB) had in its framework in 2007 relative the Fed.

It might be difficult to recall, but for the period prior to mid-December 2008, the Desk was directed to hit a point target for the federal funds rate significantly above zero. The Federal Reserve did not have authority to pay interest on reserves until October 2008, so maintaining a scarcity of reserves was the only method available to control the federal funds rate. If the Desk had allowed reserves to increase above predicted demand at the target rate, the traded rate would have fallen well below the target rate set by the Federal Open Market Committee (FOMC).

To maintain scarcity and thus control, the Desk had to "sterilize" operations aimed at easing strains in money markets; that is, it had to offset any injection of reserves by removing an approximately equivalent amount from the system. One possibility would have been for the Fed to borrow from its traditional counterparties, the primary dealers. But dealers are usually borrowers in our money markets, not lenders, meaning they had limited capacity for these kinds of transactions, especially during the crisis.

Knowing that fact, we designed the System's securities portfolio to accommodate some amount of sterilization. The portfolio was composed of a substantial stock of short-dated Treasury securities, so that, as these securities matured, the supply of reserves would shrink. Draining reserves in that way takes time, however, and the amount of liquidity that would have been needed to ease the strains in our financial markets far exceeded the amount that could be supplied while still keeping control of the federal funds rate.<sup>6</sup> Another way to drain reserves is by selling assets. The Desk did some of that in response to the crisis, but, for a variety of reasons, including operational constraints and concerns that sales of securities could have counterproductive effects, the amounts were small. Other tools that can be used to drain reserves, which were developed later, are a Term Deposit Facility and term reverse repos with extended counterparties.<sup>7</sup>

Providing liquidity to financial markets at the onset of the crisis was important to ensure that the stance of monetary policy would be transmitted to the real economy. One simple measure of the stance of policy is that the average of trading in the overnight interbank market is very close to the FOMC's target rate. However, this simple measure can provide a misleading picture. The experience of the crisis suggests that transmission of the appropriate stance can be impaired even when temporary open market operations keep the effective fed funds rate at the target. Recall that in this period the fed funds and Eurodollar markets exhibited a bifurcated structure with many foreign banks paying considerably more to borrow than U.S. banks. As Marvin Goodfriend will discuss, part of this was due to appropriate market pricing of credit risk, but other aspects reflected segmentation in the money markets that was exacerbated by a pronounced lack of dollar liquidity. Some of this decline in money market functioning was not reflected in the effective fed funds rate as it was measured at that time.<sup>8</sup>

The situation today is very different for a number of reasons. The Federal Reserve has the authority to pay interest on reserves. Many countries that run a "corridor" system of monetary policy implementation have had this authority for a long time and could transition from reserves scarcity to a state of more plentiful supply of liquidity while maintaining adequate control of their interest rate, as I noted was the experience for the European Central Bank.

In addition, the Desk has augmented an old tool, reverse repurchase agreements, or RRP for short, that allow an expanded set of counterparties to invest with the Federal Reserve either at a fixed interest rate or up to certain quantity.<sup>9</sup> With the advent of interest on reserves, RRP, and the Term Deposit Facility mentioned previously, policymakers have more tools for influencing market interest rates, and sterilization is no longer necessary to control rates with large amounts of excess reserves.

Perhaps the most important development is the successful liftoff of the federal funds rate in December. Although we don't know yet whether the interest rate control exhibited to date with the new tools will continue at different settings of the target range, so far, things have gone as well as could have been expected.

While other countries have operated a "floor" system before, no country with as complex a financial system as the United States, with its wide variety of bank and nonbank institutions, had ever attempted to raise interest rates with such a large supply of excess reserves. The success of the new tools so far has been important for instilling confidence that policymakers can control overnight interest rates at levels appropriate to meet their goals. It also means that, in future, the Federal Reserve will not have to face the same technical constraint that leads to a conflict between easing strains in broad money markets and controlling the policy rate whether it uses a floor or corridor system. This could make the Federal Reserve System more agile and better able in future circumstances to provide the elastic currency that has been one of our stated purposes since the Federal Reserve Act became law more than a century ago.

Until a few months ago, many conversations about the long-run framework for monetary policy implementation considered at least two options; on the one hand, we had the old system based on reserve scarcity inducing competition for reserves, and, on the other hand, we had a theory about how competition in a range of money markets would pull market rates up in line with the interest rates administered by the Federal Reserve. The old system certainly had flaws, many of which were exposed during the crisis, but it had worked reasonably well. And a system that works reasonably well is often more appealing than one that exists only in theory. The successful liftoff has brought theory into practice, and the results have been good so far.

I am not claiming that the current framework is perfect, or that it is necessarily better than the old framework augmented with the new tools used to directly absorb excess reserves, but it is useful to have flexibility in how to implement monetary policy. We have now seen in practice that changes in administered rates can effectively move market rates—both because effective competition helps bring administered and market rates closer together and because the mere existence of administered-rate facilities, like the RRP I mentioned earlier, can affect competition between private borrowers and investors even when these facilities see little usage. As we learn more about the practical aspects of using these mechanisms to influence money market rates in the United States, a much wider range of potential operating frameworks becomes viable. It will now be important to make sure that all the costs and benefits of different approaches are considered carefully to get the most effective framework for monetary policy implementation.

In particular, there are important trade-offs that may need to be considered in a framework that can flexibly provide liquidity for monetary policy implementation and broader transmission. It is possible, for example, that financial market participants may anticipate that the central bank will make liquidity plentiful during times of stress and that this could reduce their incentives to

manage their liquidity conservatively. For banks, new Basel III liquidity regulation, such as the liquidity coverage ratio and the net stable funding ratio, partially mitigates this concern. Nevertheless, these regulations do not apply to all participants in U.S. money markets. Paul Tucker's presentation will discuss a number of the broader costs and benefits of such potential flexibility for the role of central banks in democratic societies.

Another important aspect of the future framework is that it should be as transparent as possible. Market participants can make better decisions if they have a clear understanding of the way the central bank operates and can anticipate its actions in a wide range of circumstances. Indeed, it is well understood that in the case of coordination failures, a commitment to maintaining liquid markets can prevent illiquidity from occurring, in some cases without even having to intervene. For example, during the crisis, some money market participants did "hoard" liquidity and refuse to lend to other institutions because they were concerned that they might need the liquidity for themselves. This behavior led to a situation where liquidity was in short supply because all market participants expected it to be.<sup>10</sup> A central bank can help create conditions where market participants contribute to market liquidity because they believe that the market will remain liquid.

There are many other considerations and trade-offs, but let me wrap up by saying that to make sure we learn the right lessons from the experience of the last few years, we surely benefit from drawing on a wide range of perspectives, including those of academics, current and former central bankers, and market participants —people like you, who "live and breathe" this somewhat technical topic. It is also valuable to share the findings more broadly to enhance discourse on the subject.

I hope that you will be frank in your assessment of the things that worked well or did not work well in the Federal Reserve's framework, and perhaps in other systems. There is much to learn from a robust discussion of our different experiences. These lessons will be an input into our thinking as we examine the long-run framework.

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<sup>1</sup> I would like to thank Antoine Martin for his assistance in preparing these remarks.

<sup>2</sup> An extended effort to evaluate potential long-run monetary policy implementation frameworks was announced in the July 2015 Federal Open Market Committee (FOMC) meeting minutes. This effort was previously discussed at the dinner address for the Bank of England-Federal Reserve Bank of New York Conference on Money Markets and Monetary Policy Implementation.

<sup>3</sup> Congress had agreed to give the Federal Reserve the authority to pay interest on reserves in 2006, but this authority was to take effect on 2011. The effective date of the authority was moved forward to October 1, 2008, with the passage of the Emergency Economic Stabilization Act of 2008.

<sup>4</sup> The FOMC published its Policy Normalization Principles and Plans on September 16, 2014.

<sup>5</sup> The Federal Reserve Statistical Release H.3 shows that the monthly average of excess reserves of depository institutions was \$1.875 billion in August 2008 and \$767.319 billion in December 2008. During that period, the effective federal funds rate was often well below its target, sometimes by more than a percentage point.

<sup>6</sup> In practice in the fall of 2008, as excess reserves increased dramatically following the collapse of Lehman Brothers, the Federal Reserve relied heavily on the Treasury's Supplementary Financing Program to soak up many of the excess reserves in the system. That program consisted of a series of Treasury bill auctions, separate from Treasury's regular borrowing program, with the proceeds from these auctions maintained in an account at the Federal Reserve Bank of New York. Funds in this account drained reserves from the banking system, and therefore helped offset the reserve impact of the Federal Reserve's lending and liquidity initiatives.

<sup>7</sup> The Term Deposit Facility was established to facilitate the conduct of monetary policy by providing a tool with which the Federal Reserve can manage the aggregate quantity of reserve balances held by depository institutions. An increase in term deposits outstanding drains reserve balances because funds to pay for them are removed from the accounts of participating institutions for the life of the term deposit.

<sup>8</sup> This was due, in part, to the fact that the effective federal funds rate was a volume-weighted mean. The Federal Reserve Bank of New York recently changed the calculation of the effective federal funds rate from a weighted-average mean to a weighted-average median to make it more robust. In addition, it started publishing a broader measure of bank funding costs, the overnight bank funding rate.

<sup>9</sup> The list of counterparties can be found at this link: [https://www.newyorkfed.org/markets/expanded\\_counterparties](https://www.newyorkfed.org/markets/expanded_counterparties).

<sup>10</sup> See, for example, V.V. Acharya and D. Skeie, “A Model of Liquidity Hoarding and Term Premia in Interbank Markets,” *Journal of Monetary Economics* 58, no. 5 (July 2011): 436–47. Proceedings of *Normalizing Central Bank Practice in Light of the Credit Turmoil*, Carnegie-Rochester Conference on Public Policy.

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