

# **Interest on Reserves: History and Rationale, Complications and Risks**

Peter N. Ireland\*

Boston College and Shadow Open Market Committee

February 2018

## **Interest on Reserves**

Among the enduring legacies of the financial crisis of 2007-09, interest on reserves now plays a central role in the Federal Reserve's policymaking framework. Famous arguments justify paying interest on reserves on economic efficiency grounds. In practice, however, the Fed has used its power to pay interest on reserves to facilitate credit market interventions that extend well beyond those required by its traditional central banking functions: conducting monetary policy to stabilize the aggregate nominal price level and acting as a lender of last resort to illiquid but solvent depository institutions. Resulting complications and risks raise strong doubts about the wisdom of making interest on reserves a permanent part of the Fed's toolkit.

## **History and Rationale**

George Tolley (1957) and Milton Friedman (1960) first argued that since bank reserves can be created at zero marginal cost within a fiat money regime, economic efficiency dictates that the opportunity cost to banks of holding reserves should be driven to zero as well. Tolley and Friedman also pointed out that one way to satisfy this efficiency condition is for the central bank to pay interest on reserves at a rate approximating those available on other safe and highly liquid short-term assets, such as United States Treasury bills.

---

\* Prepared for the March 2018 meeting of the Shadow Open Market Committee.

Based largely on this economic efficiency argument, it seems, the Financial Services Regulatory Relief Act of 2006 granted the Federal Reserve authority to begin paying interest on bank reserves, though the Act postponed the effective date for its interest-on-reserves provision to October 1, 2011. The Emergency Economic Stabilization Act of 2008 pulled this effective date forward to October 1, 2008. On October 6, 2008, the Federal Reserve Board announced plans to begin paying interest on required and excess reserves at rates 10 and 75 basis points below the Federal Open Market Committee's federal funds rate target. Two days later, the FOMC cut its target for the federal funds rate from 2 to 1.5 percent. Thus, on October 9, 2008, a new policy regime took hold, with the Fed paying banks interest at the rate of 1.4 percent on their required reserves and 0.75 percent on their excess reserves.

The Fed's October 6 press release (Federal Reserve Board 2008) offered a mixed rationale for the announced change in regime. Tolley and Friedman's efficiency arguments survived, explaining the higher interest rate on required reserves, which according to the press release would "essentially eliminate the opportunity cost of holding required reserves, promoting efficiency in the banking sector." The press release gave different reasons, however, for paying interest on excess reserves:

Paying interest on excess balances should help establish a lower bound on the federal funds rate. ... The payment of interest on excess reserves will permit the Federal Reserve to expand its balance sheet as necessary to provide the liquidity necessary to support financial stability while implementing the monetary policy that is appropriate in light of the System's macroeconomic objectives of maximum employment and price stability.

Walter and Courtois (2009), Goodfriend (2011), and Selgin (2016) provide more detailed interpretations and analyses of the Board's statements. Although, in late 2007 and early 2008, the Federal Reserve successfully financed its Term Auction Facility and its lending to facilitate JP Morgan's purchase of Bear Stearns from sales of U.S. Treasury securities from its own

portfolio, the failure of Lehman Brothers and bailout of AIG in fall 2008 required far more emergency lending, which the Fed could finance only by creating new reserves. Ordinarily, reserve creation puts downward pressure on the federal funds rate but, by paying interest on excess reserves, the Fed hoped to place a floor beneath which the funds rate could not fall, since no bank will lend reserves in the federal funds market at rates below what it can receive on its deposits at the Fed.

Ireland (2017) provides an alternative, but fully consistent, view of the Fed's decision to start paying interest on reserves from a monetarist perspective, which interprets the federal funds rate as a market rate of interest rather than a policy tool and emphasizes, instead, how the central bank uses its role as monopoly supplier of base money to stabilize the price level. Specifically, by paying interest on reserves, the Fed shifted the demand curve for reserves to the right. This increase in demand allowed the Fed to simultaneously shift the supply curve for reserves to the right as required by emergency lending without also generating an increase in the aggregate nominal price level.

In hindsight, therefore, two aspects of the Fed's 2008 decision to begin paying interest on reserves stand out. First, paying interest on reserves made monetary policy *tighter* than it would otherwise have been, as measured either by the higher federal funds rate or the lower equilibrium price level implied by the shifting but still intersecting demand and supply curves for reserves. *Ex ante*, the use of interest on reserves to minimize the effects of emergency lending on the price level seemed prudent. *Ex post*, however, it turned out to be a mistake: as Hetzel (2012) points out, monetary policy ought to have been substantially more accommodative than it was throughout 2008, considering the severe deflationary recession that followed. Second, the Fed adopted its interest on reserves policy in 2008 largely to facilitate interventions in private credit

and capital markets that, as argued by Goodfriend (2011), extended well beyond those associated with its traditional role as lender of last resort to depository institutions.

Consistent with this interpretation, Federal Reserve Chair Ben Bernanke (2009a) described the central bank's large-scale asset purchase programs, introduced in fall 2008 and expanded in early 2009, as a series credit market interventions rather than an continuous effort to stabilize the price level by increasing the supply of reserves and base money:

The Federal Reserve's approach to supporting credit markets is conceptually distinct from quantitative easing (QE), the policy approach used by the Bank of Japan from 2001 to 2006. Our approach – which could be described as “credit easing” – resembles quantitative easing in one respect: It involves an expansion of the central bank's balance sheet. However, in a pure QE regime, the focus of policy is the quantity of bank reserves, which are the liabilities of the central bank; the composition of loans and securities on the asset side of the central bank's balance sheet is incidental. Indeed, although the Bank of Japan's policy approach during the QE period was quite multifaceted, the overall stance of its policy was gauged primarily in terms of its target for bank reserves. In contrast, the Federal Reserve's credit easing approach focuses on the mix of loans and securities that it holds and how this composition of assets affects credit conditions for households and businesses.

Interest on reserves took on yet another role in the aftermath of these large-scale asset purchase programs. As early as July 2009, in his Semiannual Monetary Policy Report to Congress, Chair Bernanke (2009b) singled out interest on reserves as the “most important tool” that the Fed could use to raise interest rates – thereby normalizing its monetary policy stance – while retaining on its balance sheet longer-term assets acquired during and after the crisis. And indeed, since December 2015, the Federal Open Market Committee has increased its target for the federal funds rate five times, from a range between 0 and 0.25 percent to its current range between 1.25 and 1.5, while continuing to reinvest most of the proceeds from its maturing assets, by increasing in similar steps the interest rates its pays on required and excess reserves.

Ireland (2017) outlines, again from a monetarist perspective, how under the floor system the Fed is using today, increases in the federal funds rate brought about through increases in the interest rate on reserves work to shift the demand and supply curves for bank reserves in ways that allow the Fed to continue using its role as monopoly supplier of reserves to stabilize the aggregate price level. It is true, therefore, that interest on reserves is helping the Fed achieve its conventional central banking mandate. But it is also true that interest on reserves allows the Fed to pursue those traditional objectives while maintaining an outsized role in credit markets through its large portfolio that includes, not just longer-term U.S. Treasury bonds, but substantial holdings of U.S. government agency mortgage-backed securities. By paying interest on reserves at rates close to if not above those available on other money market instruments, the Fed has satisfied Tolley (1957) and Friedman's (1960) efficiency criterion by driving the user cost of reserves to zero. But neither Tolley nor Friedman anticipated the complications and risks that arise when the Fed uses its power to create reserves to allocate credit as well as to stabilize the aggregate nominal price level.

### **Complications and Risks**

Because the rationale for interest on reserves has changed so much over time, the details of the legislation granting the Federal Reserve power to pay interest on reserves has inadvertently given rise to two sets of complications in the use of this new policy tool.

First, section 201 of the Financial Services Regulatory Relief Act of 2006 originally provided the Fed authority to pay interest on "balances maintained at a Federal Reserve bank by or on behalf of a depository institution." Section 203 of the same Act set October 1, 2011 as the effective date for this amendment to the Federal Reserve Act. Section 128 of the Emergency

Economic Stabilization Act of 2008 then amended section 203 of the earlier Act by advancing the effective date to October 1, 2008.

The operational complication arises because other, non-depository institutions, including U.S. government-sponsored enterprises and Federal Home Loan Banks, are also eligible to hold deposits at Federal Reserve banks but remain ineligible, according to the word of law, to receive interest payments on those deposits. In theory, banks could borrow reserves from those non-bank institutions at the federal funds rate and hold the reserves in their own interest-earning accounts at the Fed. This arbitrage activity would then keep the federal funds rate, if not above then at least very close to, the interest rate paid on reserves. In practice, however, a myriad of regulatory and institutional constraints has limited banks' ability and willingness to exploit this arbitrage opportunity. As a result, the floor on the funds rate gets set in the Fed's new system not by the interest rate on reserves, but instead on the interest rate on the supplementary, overnight reverse repurchase agreements that the central bank subsequently designed to pay interest on the short-term obligations it issues, not just to GSEs and Federal Home Loan Banks, but numerous other non-bank institutions, including money market mutual funds.

Goodfriend (2015, p.8) notes:

But the Fed's ... use of ON RRP is unfortunate because the use of managed liabilities on a large scale via ON RRP addresses an *operational issue* by violating an *implicit principle of central banking* in the United States – that where possible the central bank should minimize its interference in financial intermediation and credit allocation in managing the monetary system.

In other words, an oversight in the original legislation – not allowing the Fed to pay interest on all deposits held at the Federal Reserve banks – has inadvertently led to the creation of yet another program – for overnight RRP – that expands still further the Fed's reach into private financial markets. This should be easy for Congress to fix, exactly as suggested by Goodfriend

(2015), through legislated amendments that either allow the Fed to pay interest on deposits held by the GSEs and Federal Home Loan Banks or restrict the Federal Reserve banks to accept deposits only from the depository institutions already authorized to receive interest on reserves.

Second, section 201 of the Financial Services Regulatory Relief Act of 2006 granted the power to set interest rates on reserves to the Federal Reserve Board of Governors, not to the Federal Open Market Committee. This allocation of power makes sense if the principal rationale for paying interest on reserves is the efficiency argument originally articulated by Tolley (1957) and Friedman (1960). As noted by Plosser (2017) and Selgin (2018), however, now that interest on reserves is being used as one of the key levers in the Fed's floor system for targeting the federal funds rate, a potential problem of governance arises. What happens if a majority on the FOMC vote to change the federal funds rate target, but a majority on the Federal Reserve Board refuses to change the interest rate on reserves? Again, this problem has an easy fix: Congress should amend the 2006 Act, reassigning to the entire FOMC the power to set the interest rate on reserves.

Bigger risks, however, are posed by Fed's new ability to expand its balance sheet almost without limit, it seems, using its authority to pay interest on reserves. These risks take two forms: economic and political.

As Bassetto and Messer (2013) clearly and skillfully show, the Fed could minimize the economic risks posed by its expanded balance sheet by matching its interest-bearing liabilities – reserves and reverse repurchase agreements – with interest-earning assets of similar maturity, such as very short-term U.S. Treasury bills. After specifically buying longer-term U.S. Treasury and government agency bonds in its large-scale asset purchase programs, however, the Fed has exposed to itself interest rate risk. In what Goodfriend (2014) has aptly called “monetary policy

as a carry trade,” the Federal Reserve now borrows short and lends long, earning profits so long as the yield curve continues to slope upward but facing losses if the yield curve inverts. Studies including Carpenter, Ihrig, Klee, Quinn, and Boote (2013), Greenlaw, Hamilton, Hooper, and Mishkin (2013), and Christensen, Lopez, and Rudebusch (2015) present simulations suggesting these economic risks are manageable. Yet it is still worth considering that similar risks were once faced – and presumably deemed manageable – at Bear Stearns and Lehman Brothers. And look what happened to them.

Political risks loom even larger. Reserves and reverse repurchase agreements represent a low-cost source of funds that the Fed has already used to finance a large portfolio of mortgage-backed securities, thereby actively channeling funds to a specific sector of the private economy. And the Fixing America’s Surface Transportation Act of 2015 drew directly on the Fed’s surplus capital, earned as profits from its carry trade, to help fund federal highway spending; the Bipartisan Budget Act of 2018 did the same to finance more general increases in government spending. The risks of pushing still further are described most vividly by Plosser (2017, p.8):

First and foremost, an operating regime where the Fed’s balance sheet is unconstrained as to its size or holdings is ripe for misuse if not abuse. ... Congress would be free to lobby the Fed through political pressure or legislation to manage the portfolio for political ends. ... More generally the temptation would be to turn the Fed’s balance sheet into a huge hedge fund, investing in projects demanded by Congress and funded by forcing banks to hold vast quantities of excess reserves on which the central bank pays the risk-free rate. Of course, this just represents off-budget fiscal policy.

One way of managing this risk would be for the Fed to commit to a “Treasuries only” policy according to which, in the future, it agrees to purchase only direct obligations of the U.S. Treasury. Then, specific spending initiatives or credit market interventions could be undertaken only through an act of Congress. But a better way might be to remove temptation altogether, by abandoning interest on reserves.



## **A Way Out**

In modern central banking as in modern design, it's often true that less is more: monetary policy works best when the central bank's focus is narrow. By using its monopoly supply of base money to stabilize the aggregate price level, the central bank creates the most favorable environment within which the private economy adjusts most efficiently to shocks and remains closest to its long-run growth path. Though originally conceived of tool for promoting further economic efficiency, interest on reserves has, in practice, led the Federal Reserve to become more deeply entrenched in financial markets and more actively engaged in the allocation of credit. In Taylor's (2016, p.719) words, interest on reserves "enables the Fed to be more like a discretionary multipurpose institution rather than the rule-like limited purpose institution that has delivered good policy in the past and that can deliver good policy in the future."

Having previously proposed a system involving interest on reserves, Friedman (1969) showed that the same efficiency condition could be achieved, instead, by asking the central bank to steadily contract the money supply to produce enough aggregate price deflation to reduce nominal interest rates to zero. Zero nominal interest rates are, of course, linked more closely in central bankers' minds to the Keynesian liquidity trap than to Friedman's rule for the "optimum quantity of money." Nevertheless, outcomes approximating the Friedman rule can still be achieved, away from the zero nominal interest rate bound, by policies that simply aim to keep inflation low and stable. This is the best way out: shrinking the balance sheet as quickly as possible, eliminating the interest on reserves and reverse repurchase agreement programs, and restoring the emphasis on long-run price stability would help most, in allowing the Fed deliver good policy in the future.

## References

Bassetto, Marco and Todd Messer. “Fiscal Consequences of Paying Interest On Reserves.”

*Fiscal Studies* 34 (December 2013): 413-436. Available at

<http://onlinelibrary.wiley.com/doi/10.1111/j.1475-5890.2013.12014.x/epdf>.

Bernanke, Ben S. “The Crisis and the Policy Response.” Stamp Lecture. London: London School of Economics, 13 January 2009<sup>a</sup>. Available at

<https://www.federalreserve.gov/newsevents/speech/bernanke20090113a.htm>.

Bernanke, Ben S. “Semiannual Monetary Policy Report to Congress.” Before the U.S. House of Representatives Committee on Financial Services, 21 July 2009<sup>b</sup>. Available at

<https://www.federalreserve.gov/newsevents/testimony/bernanke20090721a.htm>.

Bipartisan Budget Act of 2018. Public Law 115-123, 9 February 2018. Available at

<https://www.congress.gov/115/bills/hr1892/BILLS-115hr1892enr.pdf>.

Carpenter, Seth B., Jane E. Ihrig, Elizabeth C. Klee, Daniel W. Quinn, and Alexander H. Boote.

“The Federal Reserve’s Balance Sheet and Earnings: A Primer and Projections.” Finance and Economics Discussion Series 2013-01. Washington: Federal Reserve Board, September 2013. Available at

<https://www.federalreserve.gov/pubs/feds/2013/201301/revision/201301pap.pdf>.

Christensen, Jens H.E., Jose A. Lopez, and Glenn D. Rudebusch. “A Probability-Based Stress Test of Federal Reserve Assets and Income.” *Journal of Monetary Economics* 73 (July 2015): 26-43.

Emergency Economic Stabilization Act of 2008. Public Law 110-343, 3 October 2008. Available

at <https://www.congress.gov/109/plaws/publ351/PLAW-109publ351.pdf>.

Federal Reserve Board. Press Release, 6 October 2008. Available at

<https://www.federalreserve.gov/monetarypolicy/20081006a.htm>.

Financial Services Regulatory Relief Act of 2006. Public Law 108-351, 13 October 2006.

Available at <https://www.congress.gov/109/plaws/publ351/PLAW-109publ351.pdf>.

Fixing America's Surface Transportation Act. Public Law 114-95, 4 December 2015. Available

at <https://www.congress.gov/114/plaws/publ94/PLAW-114publ94.pdf>.

Friedman, Milton. *A Program for Monetary Stability*. New York: Fordham University Press, 1960.

Friedman, Milton. "The Optimum Quantity of Money." In *The Optimum Quantity of Money and Other Essays*. Chicago: Aldine Publishing Company, 1969.

Goodfriend, Marvin. "Central Banking in the Credit Turmoil: An Assessment of Federal Reserve Practice." *Journal of Monetary Economics* 58 (January 2011): 1-12.

Goodfriend, Marvin. "Monetary Policy as a Carry Trade." *Bank of Japan Monetary and Economic Studies* (November 2014): 29-44. Available at

<http://www.imes.boj.or.jp/research/papers/english/me32-3.pdf>.

Goodfriend, Marvin. "The Fed Should Fix the Interest on Reserves Floor." Position Paper. New York: Shadow Open Market Committee, 20 March 2015. Available at

<http://shadowfed.org/wp-content/uploads/2015/03/GoodfriendSOMC-March2015.pdf>.

Greenlaw, David, James D. Hamilton, Peter Hooper, and Frederic S. Mishkin. "Crunch Time: Fiscal Crises and the Role of Monetary Policy." Manuscript. San Diego: University of California, July 2013. Available at

[http://econweb.ucsd.edu/~jhamilto/USMPF13\\_final.pdf](http://econweb.ucsd.edu/~jhamilto/USMPF13_final.pdf).

- Hetzel, Robert L. *The Great Recession: Market Failure or Policy Failure?* New York: Cambridge University Press, 2012.
- Ireland, Peter N. “A Monetarist View of Policy Renormalization.” Position Paper. New York: Shadow Open Market Committee, 15 September 2017. Available at [http://shadowfed.org/wp-content/uploads/2017/09/IrelandSOMC\\_September2017.pdf](http://shadowfed.org/wp-content/uploads/2017/09/IrelandSOMC_September2017.pdf).
- Plosser, Charles I. “The Risks of a Fed Balance Sheet Unconstrained by Monetary Policy.” Economics Working Paper 17102. Stanford: Hoover Institution, May 2017. Available at <https://www.hoover.org/sites/default/files/research/docs/17102-plosser.pdf>.
- Selgin, George. Testimony Before the U.S. House of Representatives Subcommittee on Monetary Policy and Trade, 17 May 2016. Available at <https://financialservices.house.gov/uploadedfiles/hhrg-114-ba19-wstate-gselgin-20160517.pdf>.
- Selgin, George. Testimony Before the U.S. House of Representatives Subcommittee on Monetary Policy and Trade, 10 January 2018. Available at <https://financialservices.house.gov/uploadedfiles/hhrg-115-ba19-wstate-gselgin-20180110.pdf>.
- Taylor, John B. “Interest on Reserves and the Fed’s Balance Sheet.” *Cato Journal* 36 (Fall 2016): 711-720. Available at [https://object.cato.org/sites/cato.org/files/serials/files/cato-journal/2016/9/cj-v36n3-13\\_0.pdf](https://object.cato.org/sites/cato.org/files/serials/files/cato-journal/2016/9/cj-v36n3-13_0.pdf).
- Tolley, George S. “Providing for Growth of the Money Supply.” *Journal of Political Economy* 65 (December 1957): 465-485.
- Walter, John R. and Renee Courtois. “The Effect of Interest on Reserves on Monetary Policy.” Federal Reserve Bank of Richmond *Economic Brief* EB09-12, December 2009.

Available at

[https://www.richmondfed.org/~media/richmondfedorg/publications/research/economic\\_brief/2009/pdf/eb\\_09-12.pdf](https://www.richmondfed.org/~media/richmondfedorg/publications/research/economic_brief/2009/pdf/eb_09-12.pdf).