Interest on Reserves

Notes from the Vault
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The payment of interest on excess reserves has been back in the news in recent months with two announcements: the Federal Open Market Committee's (FOMC) decision to raise the target funds rate and rate paid on reserves at its December 2016 meeting, and the Federal Reserve Board's January 2017 announcement of remittances to the U.S. Treasury. Although most of the news focused on the implications of the higher rates for the economy, a Reuters article presented the decision to increase the rate paid on reserves as providing a "boon to some of the largest institutions." Similarly, blogger Wolf Richter explained that the payment of interest on reserves had the result that the "U.S. government gets $12 billion less in revenues," but he continued on to say, "Don't worry, the banks are happy."

The role of the payment of interest on reserves may come under even more scrutiny in the coming year, with the median projections of the Board and Reserve Bank presidents consistent with as many as three more hikes of 0.25 percentage points.

This *Notes from the Vault* post will review why the Federal Reserve pays interest on reserves (IOR), what role IOR played during and after the financial crisis, and what the short- to medium-run implication of abolishing interest on reserves may be.

Interest on reserves prior to the crisis
Banks were allowed to earn interest on reserves held at correspondent banks prior to the founding of the Federal Reserve, according to Federal Reserve Bank of Kansas City economist Stuart E. Weiner. However, the original Federal Reserve Act did not give the Fed explicit authority to pay interest on reserves that national and state member banks were required to hold at the Federal Reserve, according to Baylor Professor David D. VanHoose.[1] This became a problem for the Federal Reserve in the 1970s as interest rates rose and with it the cost of Federal Reserve membership, resulting in more than 500 banks withdrawing from membership. To stop the exodus of member banks, the Federal Reserve proposed paying interest, but instead Congress stemmed the exodus by extending reserve requirements to all banks with the Depository Institutions Deregulation and Monetary Control Act (DIDMCA) of 1980.

Although banks could not avoid reserve requirements post-DIDMCA, the requirements remained costly and banks sought ways to minimize the cost. The problem from the banks' perspective was the money to fund the reserve requirements was not free. The marginal effect of holding reserves was to increase a bank's cost of funding itself without providing any offsetting revenue to the bank. That is, a bank would need to purchase additional funds in deposit or other short-term markets, pay deposit insurance premiums on any increase in deposits, and possibly hold additional costly equity.[2,3]

The result was the failure to pay interest on reserves effectively acted as a tax on banks, and banks responded like most taxpayers respond to any tax—they sought legally to reduce the burden. For example, VanHoose explains that in the early 1990s, banks started implementing sweep accounts, which electronically moved funds from accounts subject to reserve requirements to accounts not subject to requirements. Banks also sought to reduce the tax by relying on riskier mechanisms for transferring funds in wholesale markets, according to University of Illinois Professor Charles Kahn and my colleague William Roberds (1998). To the extent banks could not avoid the tax, they would try to shift the cost to their customers by paying lower rates to some depositors and charging more to some creditors.

In response to calls to eliminate the reserve tax, Congress agreed to allow the payment of interest on reserves with the inclusion of Section 201 in the Financial Services Regulatory Relief Act of 2006. However, to postpone the budgetary cost of the measure, the authority was not scheduled to take effect until October 2011.

Although the 2006 bill was principally about regulatory relief, the authority to pay interest on reserves also added to the Federal Reserve's monetary policy tool kit. The way in which the Federal Reserve conducted monetary policy prior to the crisis was to add or drain reserves in an attempt to keep the federal funds rate within a narrow range around the target set by the FOMC. However, unexpected external shocks to the supply or demand for funds in the market could sometimes lead to large changes up or down in the funds rate. The legislative developments section of the 93rd Annual Report (2006) of the Fed's Board of Governors observed the ability to pay interest on reserves would help set a minimum rate in the funds market and thus, dampen volatility in the fed funds rate.

Interest on reserves during the crisis and recovery
The Federal Reserve's precrisis method of changing banks' reserves to control the federal funds rate became progressively more difficult to manage as the crisis advanced, starting in 2007. The problem was the Federal Reserve was lending increasingly large amounts of reserves through its discount window and various crisis-related liquidity facilities. The Fed took a variety of steps by itself and in conjunction with the U.S. Treasury to offset the impact of the loans on reserves and thereby allow the Fed to retain control over the funds rate. However, demand on the Fed's liquidity facilities spiked shortly after Lehman Brothers' failure in September 2008 (see figure 1 of the Federal Reserve Bank of San Francisco's Dr. Econ), and total reserves in the banking system grew to sums far in excess of banks' required reserves. Absent further action, the federal funds rate of 2 percent (through October 8, 2008) would have collapsed to virtually zero and the Fed would have lost its primary monetary policy tool.

In response to this critical need, Congress included Section 128 in the Emergency Stabilization Act of 2008, which advanced the date the Federal Reserve could pay interest to October 2008. A press release on October 6, 2008, announced the Board was using this authority effective October 9.

The urgent demand for Federal Reserve loans started to abate by March 2009 but the usefulness of IOR did not. As its outstanding loans declined, the Fed started purchasing agency debt and mortgage-backed securities (MBS) as well as longer-dated Treasury securities. These purchases supplied additional reserves, offsetting the reduction that would have taken place as the Fed's crisis-related loans were repaid. The Fed made these purchases because the federal funds rate had fallen to "its effective lower bound" (from a 2012 speech by Federal Reserve Chairman Ben S. Bernanke), so other measures were needed to support economic growth. The purchases, which the Fed called large-scale asset purchases (LSAP), were intended to lower longer-term rates and otherwise encourage higher asset prices in order to stimulate economic activity.

The Federal Reserve followed up the 2009 asset purchase program with two more rounds of LSAPs. In his 2012 speech, Bernanke explained that LSAP acquisition of longer-dated Treasury securities and MBS could lower other long-term rates as those that sold the securities to the Fed rebalanced their portfolios to hold other longer-dated instruments. He also observed that it could work through other channels. For example, the Fed purchases of longer-dated securities could help in providing credibility to the FOMC's statements that the Fed intended on maintaining low rates for an "extended period." Finally, Bernanke observed that the available studies at that time found evidence the LSAPs had lowered long-term Treasury rates by economically meaningful amounts.

Around the time of Bernanke's speech, New York Fed President William C. Dudley gave a speech in which he estimated the LSAPs had roughly the same effect as cutting the federal funds rate by 150 to 200 basis points. In other words, the Federal Reserve would have had to lower short-term interest rates to well under *negative* 1 percent to have the same effect as the LSAP programs had in stimulating the economy. However, Dudley also observed his estimate should be "considered very imprecise."

Subsequent research is somewhat mixed but has generally supported the conclusion that the LSAP and similar programs by other central banks were successful in lowering rates.[4] Still, not everyone is convinced the LSAP had such an effect. For example, St. Louis Fed economist Stephen Williamson argues that the evidence that the "QE (or LSAP) worked as intended is pretty sketchy."[5]

Historical implications of paying IOR on the Treasury

In order to analyze the impact on the Treasury of paying IOR, one needs to ask what the counterfactual would have been if the Fed had not been given permission to pay IOR. This exercise is necessarily speculative. But given the risks to monetary control, one plausible response by the Federal Reserve would have been to conduct a smaller LSAP program and reduce its securities holdings as economic conditions improved.

Given the counterfactual of a smaller Federal Reserve balance sheet with smaller securities holdings and less reserves, the next step is to see how that would feed through to Treasury remittances. The simplest way to evaluate the feed through is to view the Federal Reserve and the Treasury as a single unit rather than two independent units. This makes economic sense for our purposes, as there is an almost one-to-one correspondence between Fed net earnings and remittances to the Treasury. Moreover, the largest share of Fed securities holdings has generally been Treasury securities.[6]

Looked at from this perspective, what the LSAPs did is swap interest-bearing, long-term Treasury securities held by the public for interest-bearing overnight reserves that must be held by banks.[7] That is, the Treasury pays the interest rate on long-term debt to the Federal Reserve, the Fed in turn pays part of the interest it earned as IOR to the banks and returns the rest of the interest to the Treasury. Effectively, all the Fed has done is change the maturity composition of the federal debt and force banks to hold that debt in the form of reserves.[8] The reason the Fed has positive earnings it remits to the Treasury is because the short-term rate the Fed has been paying is less than the long-term rate on the securities it holds.[9]

Once the Treasury and Fed balance sheets are integrated, we can see that paying IOR had two effects. Paying IOR to the banks lowered Fed earnings for any given size of the Fed balance sheet, which in turn reduced remittances. However, to the extent the Fed purchased more securities because of IOR, the Fed also earned more income on the spread between the long-term Treasury rate and IOR. Thus, the direct effect of the authorization of IOR on Treasury remittances is ambiguous and depends on the extent to which the Fed's LSAPs would have been reduced absent IOR.

Along with the direct impact, there is the indirect effect of IOR on the economy through the FOMC's choice of the size of the LSAP programs. If the LSAP programs were smaller, the amount of stimulus provided to the economy likely would have been smaller, resulting in an economy that grew more slowly and produced less tax revenue for the Treasury. Of course, any estimate of the impact would not only depend on how much smaller the LSAP would be but also the impact of the LSAP on the economy through interest rates.[10]

Consequences of eliminating IOR in the near future

If one believes that IOR is merely a "boon" to banks that makes them "happy," the clear implication would seem to be that the payment of interest on reserves should be terminated.[11] However, the above analysis suggests there is much more to the story than simply taking money from the banks and giving it to the Treasury. What would be the implications of ending IOR in the near future?

One obvious implication of ending IOR is that it restores a tax on banks. Banks would still have to pay to borrow the funds they held in reserve accounts, they would have to pay deposit insurance on those borrowed funds, and they would incur the private costs of increased capital requirements. Each bank would likely also return to taking costly measures to reduce its share of the reserve tax.

In terms of monetary policy, the biggest problem is that eliminating IOR would suddenly make monetary policy far more accommodative than the FOMC is likely to judge to be appropriate. The overnight rate would immediately drop to zero, whereas the FOMC currently judges the appropriate federal funds rate to be between 0.50 percent and 0.75 percent, and many Committee members expect to increase this target by as much as 0.75 percentage points this year.

The response advocated by Wolf and by Cato Institute Senior Fellow George Selgin would be for the Federal Reserve to offset the unintended easing by selling Treasury securities. The Fed could sell securities as one possible response and in principal, it should be possible to use asset sales to offset the loss of IOR exactly. However, there would be formidable challenges to doing so. The Federal Reserve has considerable experience calibrating its policy using a target for short-term interest rates. However, the Fed's only experience with buying securities as its primary tool was during the LSAPs when economic growth was negative and short-term rates were at their effective lower bound. Moreover, the Fed has no experience relying on asset sales as its primary monetary policy tool during a period of moderate growth and potentially accelerating inflation. Thus, eliminating IOR and forcing the Fed to rely on securities sales increases the risk the FOMC's choice of the amount of securities to sell will turn out to be significantly more or significantly less stimulative than intended.[12] If the amount of sales ordered by the FOMC was too small, the resulting excessive stimulation would likely result in higher inflation. If the amount of sales was too large, the resulting excessive tightness could cause the economy to go into a recession.

The other obvious issue is the impact of banning IOR on the Treasury. The Federal Reserve would pay little or no interest, but it would also earn less on its smaller securities portfolio. How quickly the reductions in the portfolio size would offset the gains from not paying IOR would depend upon the FOMC's decisions.[13] A second consideration for the Treasury would be the impact of the speed of Fed sales on the prices received by the Fed and the operation of financial markets. If the required rate of reduction in the portfolio was sufficiently high, the Fed could find itself forced to sell securities at below equilibrium prices to find willing buyers. Any resulting losses would ultimately flow through Fed earnings and also reduce Fed remittances to the Treasury. Finally, there is the possibility that uncertainty about the impact of sales will cause the Fed to sell too much, resulting in a recession that lowers tax revenues. Alternatively, if the Fed does not sell enough securities, we could see higher than desirable inflation, which would increase the nominal interest rates the Treasury pays on newly issued debt.

Conclusion

The payment of interest on reserves serves both microeconomic and monetary policy purposes. It removes a tax on banks and thereby eliminates the incentive for banks to use real resources and take additional risks to minimize their tax burden. The ability to pay IOR also provided an important safety mechanism that allowed the Federal Reserve to proceed with the LSAP program. Moreover, eliminating IOR at this stage would not necessarily improve the position of the Treasury, especially once the risk of fire sales is considered. Finally, regardless of what one thinks of the merits of the Fed retaining such a large portfolio in the long run, IOR provides a well-understood monetary policy tool that reduces the risk of inadvertent mistakes in the short to medium run.

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References

Kahn, Charles M., and William Roberds, 1998. "Payment System Settlement and Bank Incentives." *Review of Financial Studie*s 11, no. 4: 845–870.

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[1] All national banks are required to become members of the Federal Reserve.

[2] A bank's interest earnings depend upon the spread between the rate it receives on its assets and the cost of its funding. Thus, an increase in IOR associated with an increase in other short-term rates will generally not be associated with substantially higher bank profits.

[3] In an earlier post, I explained how higher levels of IOER (interest on *exces*s reserves) required to compensate for regulatory costs provide a subsidy to the Federal Deposit Insurance Corporation and U.S. branches of foreign banks.

[4] Analysis of this issue includes a 2012 paper by San Francisco Fed economists Jens H.E. Christensen and Glenn D. Rudebusch, and two papers presented at a 2016 conference on extraordinary monetary policy cosponsored by the Atlanta Fed's Center for Financial Innovation and Stability: a paper by Federal Reserve Board economists Alexander Boote, Jeffrey Huther, Jane Ihrig, Elizabeth Klee, and Richard Sambasivam and a paper by Christensen and International Monetary Fund economist Signe Krogstrup.

[5] The LSAP program is often given the somewhat misleading name of quantitative easing or QE. The QE terminology suggests the main purpose of the program was to expand the supply of reserves outstanding primarily for the purpose of increasing the money supply (such as M2). Although an increase in the M2 would likely accompany a more vigorous expansion, the FOMC never suggested it was looking for large increases in the money supply, certainly nothing in proportion to the expansion of reserves produced by the LSAP.

[6] The LSAP programs also resulted in the purchase of a substantial amount of agency debt and MBS. However, the U.S. Treasury absorbed the losses borne by Fannie Mae and Freddie Mac as a result of the crisis and have taken essentially all of their net earnings since the crisis. Thus, Federal Reserve purchases of agency obligations, especially the agencies' direct debt, has an effect somewhat similar to that of the Fed buying Treasury securities.

[7] This analysis is somewhat simplified in that it does not take into account the Federal Reserve's use of overnight reverse repurchase (ON RRP) agreements to reduce outstanding reserves. However, the inclusion of ON RRP would not change the analysis very much as the Fed also pays interest to its counterparties in ON RRP. The principal difference is that the FOMC has been setting the ON RRP rate at 0.25 percentage points less than IOR. Moreover, ON RRP also has some potential problems that I discussed in an earlier post.

[8] Individual banks can increase or decrease their holdings of reserves, but in aggregate the banking industry has no control over the amount of reserves it must hold.

[9] Although the interest receipts from the Federal Reserve's portfolio currently exceed the rate the Fed pays on IOR, whether this will hold in the future is less clear, as I explained in an earlier post.

[10] To provide some sense of the importance of tax receipts relative to interest payments, the U.S. Bureau of Economic Analysis publishes a spreadsheet (see table 3.2, Federal Government Current Receipts and Expenditures) showing tax receipts rising from $2,191 billion in 2009 to $3,343 billion in 2015 (exclusive of taxes on Federal Reserve Banks). Over that same period, the Federal Reserve Board reports interest payments to banks rising from a reported $2.2 billion in 2009 to a reported $7 billion in 2015 (increasing to a reported $12 billion in 2016). Thus, the LSAP programs need only be credited with a small positive impact on the cumulative growth in the economy and taxes following the crisis to more than cover the interest paid to banks.

[11] A recent commentary by Cato Institute's George Selgin advocates that the Federal Reserve be allowed to pay interest on required reserves but not on interest on excess reserves (IOER). This approach would be better than banning interest on all reserves, as it would somewhat reduce the tax on banks, but otherwise all of the analysis in this section applies to banning IOER.

[12] This is not meant to imply the Fed must permanently retain such a large portfolio with the current amount of total reserves. For example, it would be possible for the Fed gradually to reduce the size of its portfolio via run-off and sales while relying on changes in IOR to make marginal adjustments to the overall degree of accommodation provided by monetary policy.

[13] Although the interest receipts from the Federal Reserve's portfolio currently exceed the rate the Fed pays on IOR, whether this will hold true in the future is less clear, as I explained in an earlier post.

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