

Financing Central Bank Operations,
Interest on Reserves, and Potential Losses
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Most central bankers and their colleagues in academia believe an independent central bank – one able to make monetary policy decisions independent of the political cycle and political considerations generally – will achieve better economic outcomes than one responding to political pressures. In particular, an independent central bank will have greater success achieving and maintaining low rates of inflation. Among the mechanisms used to support independence is allowing the central bank to fund its activities from its earnings rather than through a budget requiring legislative approval. A central bank that depends on the votes of a political body to finance its operations is likely to be sensitive to the views of those controlling the purse strings regardless of what else is done to promote independence.

Financing Central Bank Operations

Most central banks conduct monetary policy by buying and selling securities. These securities pay interest. In purchasing securities or other assets, central banks create liabilities, usually in the form of currency or commercial bank deposits - “reserves” - at the central bank. Currency pays no interest. Historically, central banks did not pay interest on the reserves held with them or paid a rate below the market rate. Increases in the central bank’s liabilities tend to stimulate economic activity, with increased reserves supporting an expansion in private lending and bank money (bank deposits and their close substitutes.)

Central banks’ sales of securities lead to a contraction in liabilities. But since a growing economy generally needs a growing money supply and increases in lending, central banks buy more securities over time than they sell. Thus, they acquire sizable portfolios of securities backed by central bank liabilities. The interest income generated by their assets usually exceeds any interest expense associated with their liabilities by a substantial margin.

There are variations on this model. Individual central banks differ in the composition of their assets and liabilities. On the asset side, some buy only central government securities; others buy an array of securities, even including private equities; some have large portfolios of loans to commercial banks. On the liability side, central banks sometimes issue their own long-term debt or provide reserve-like deposits to non-bank financial institutions. In the following, we ignore these differences to focus on the key point: central banks have portfolios of assets that normally produce enough income both to cover any interest expenses on their liabilities and to finance the central bank’s operations, with an often-sizable excess available to be turned over to the government.

Focus on the Fed

The Federal Reserve System’s assets are dominated by U.S. federal government and agency securities. These securities pay interest. The Fed’s liabilities are primarily currency

(cash) and the reserve deposits of commercial banks and other depository institutions (reserves.) Beginning in 2021, the Fed introduced a new reverse repurchase program creating short-term liabilities that are similar to reserves and that are available to non-bank financial institutions. References to reserves in 2021 and 2022 include these liabilities.

Until the Global Financial Crisis, cash accounted for almost all of the Fed's liabilities. No interest is paid on cash. Nor did Fed pay interest on banks' reserve deposits. Thus, in 2007 the Fed's holdings of securities and other assets generated interest income of \$41 billion, while its liabilities incurred interest expenses of less than \$2 billion. The Fed's operating costs were just over \$4 billion, so it was able to pay for its own activities and still turn over \$35 billion to the U.S. Treasury.

Interest on Reserves

In late 2008 the Federal Reserve started paying interest on reserves (IOR). The main reason for the change seems to have been to stabilize the federal funds rate, the official policy rate, as the Fed reacted aggressively to unfolding financial turmoil. The IOR rate was very low – 0.25 percent at year-end - in keeping with a target of 0 to 25 basis points for the federal funds rate.

Shortly after the Fed introduced IOR, it also began to buy securities at an unprecedented pace in an effort to stimulate the economy. Between August 2008 and December 2009, the Fed's assets more than doubled, from less than a trillion dollars to \$2.2 trillion. On the liability side, banks' reserves with the Fed grew from less than \$20 billion in August 2008 to over a trillion dollars at the end of 2009. The Fed paid interest on these reserves, but with the interest rate on reserves close to zero and with cash still comprising over 40 percent of the Fed's liabilities, total interest expense in 2010 came to only \$3 billion. Meanwhile, the Fed's expanded portfolio of securities generated substantially more interest income. Not only did the Fed's holdings of securities more than double in size but the Fed also shifted its purchases towards longer term – and higher yielding – securities, trying to lower longer-term interest rates. Interest income in 2010 amounted to \$83 billion. With operating expenses of \$5 billion the Fed passed on \$79 billion to the Treasury.

For the next several years, this remained the situation. The recession had been severe and the recovery was slow. The federal funds rate and interest rate on reserves were kept near zero. The Fed continued to add to its securities portfolio. Assets in December 2014 were roughly \$4.5 trillion. Interest income rose to \$116 billion, while interest expense was just \$7 billion. The Fed's annual remittance to the Treasury reached \$97 billion in 2014 and \$117 billion in 2015, as Congress voted an additional transfer. But then the Fed stopped adding to its balance sheet and began raising interest rates.

Impact of Higher Rates

After one 25 basis point increase in December 2015, the Fed began raising the federal funds target in earnest in December 2016. With each increase in the federal funds

rate, the interest rate paid on reserves was also increased. By December 2018, the federal funds target stood at 2¼ to 2½ percent and the rate paid on IOR at 2.40 percent. In 2018 the Fed also allowed its portfolio of securities to shrink modestly by not reinvesting maturing securities.

Increasing the interest rate paid on reserves resulted in successive jumps in interest expenses. By 2018, interest expenses were \$43 billion. Interest income, on the other hand, was essentially unchanged, reflecting the shrinkage of the portfolio and the large fraction of securities acquired earlier when interest rates were lower. Until these older securities matured, the Fed could not replace them with securities yielding higher current rates without taking a capital loss. The Fed transferred only \$65 billion to the Treasury in 2018 and \$55 billion in 2019. Then came the pandemic.

Pandemic Response

The Federal Reserve deployed all its tools in responding to the pandemic. By March 2020, the Fed had reduced the federal funds rate and the rate on IOR to almost zero. It launched new lending programs. And it bought securities – lots of securities. Total assets surpassed \$7 trillion in December 2020 and came close to \$9 trillion in December 2021. Reserves also ballooned; but with the interest rate paid on reserves back near zero, interest expenses fell sharply. Interest expenses in 2021 were only \$6 billion versus interest income of \$123 billion. The Fed's operating expenses were about \$9 billion, allowing remittances to the Treasury of \$109 billion.

But the situation changed abruptly in 2022. As the economy rebounded, a constellation of factors caused inflation to soar and the Federal Reserve - fearing it was behind the curve - raised interest rates forcefully.

Higher Interest Rates and IOR

In the spring of 2022, the Fed began to raise the federal funds rate and the rate paid on reserves in a series of large steps. The federal funds target was increased from 0 to 25 basis points at the start of the year to 4.25-4.50 percent at the end of December. The rate paid on reserves rose to 4.40 percent. At the time this was written, Federal Reserve officials were calling for further rate increases.

With sharply higher interest rates and a larger portfolio, the Fed's interest income rose to \$170 billion in 2022. However, interest expenses rose even more – from just \$6 billion in 2021 to \$102 billion in 2022. Thus, NET interest income fell from \$117 in 2021 to \$68 billion in 2022. With operating expenses of \$8 billion, this left about \$60 billion to be transferred to the Treasury.

However, the Fed had already transferred \$76 billion to the Treasury in the first three quarters of 2022. It stopped making payments to the Treasury as it became apparent that earnings on its portfolio were not sufficient to cover the higher interest expenses arising from IOR, plus the Fed's relatively small operating costs.

The Fed will not resume payments to the Treasury until earnings cover expenses and until the capital of the Fed, which was depleted by the excess payments, meets a certain threshold. From an accounting perspective, this excess of costs over earnings – or loss – is balanced by a “deferred asset” representing the cumulative shortfall to be recouped before remittances resume. How soon this happens depends upon interest income and interest expense. Interest expense, as we have seen, is highly sensitive to changes in the rate of interest paid on reserves, which is set based on the target for the federal funds rate. An increase in the IOR rate immediately increases expenses; a decrease reduces them. The effect of rate changes on earnings is not as immediate, as interest income also reflects the size and composition of the Fed’s portfolio of securities.

Implications

Do these losses matter?

With the annual federal deficit surpassing a trillion dollars, readers can judge for themselves whether the Fed’s remittances to the Treasury are consequential to the government’s fiscal position. Remittances, which are counted as revenues to the federal government, averaged about \$85 billion over the 12 years 2010 through 2021 and offset about 30 percent of the government’s net interest expense in this period. At a minimum, their volatility – the fact that they can drop sharply and even disappear at a time of rising interest rates - would seem to make their impact worthy of attention.

Federal Reserve officials are adamant that such losses need not affect the conduct of monetary policy. Other central banks experienced losses in the past and continued to function effectively. Central banks can always pay for purchases of securities, as well as interest expenses and operating costs – whatever, by issuing currency and creating more reserves. At present, with interest rates rising and interest expenses increasing faster than interest income, creating reserves may seem like a dog chasing its tail. But when interest rates stabilize, earnings on securities will catch up with the interest cost of reserves. In a stable rate environment, interest income will eventually exceed interest expense as long as the public holds significant currency, which pays no interest. And when interest rates fall, the cost of interest on reserves will plummet while earnings on securities decline gradually, if at all. So, any losses experienced in the near term will be offset by profits down the road. Central banks can still engage in open market operations and carry on the rest of their business even if incurring losses.

Of course, perceptions matter. It may appear unseemly to some of the public or Congress that the central bank is increasing its balance sheet by buying more securities, thereby increasing reserves and the money supply, in order to pay interest owed to financial institutions and cover its own operating expenses (even if only \$8 billion.) The potential for misunderstanding seems particularly acute when it is increasing interest rates for everyone and not contributing to the Treasury. And misunderstandings of the central bank’s goals and processes and most importantly who it ultimately serves, whether the

public or financial institutions or its own agenda, can be a threat to its independence and, hence, its ability to conduct monetary policy.

The large swings in the payments to financial institutions also raise questions about how monetary policy operates in the context of interest on reserves. While there has been some discussion of whether payment of interest on reserves encourages financial institutions to park funds in reserves rather than make loans, the prevailing view is that IOR makes little difference to financial institutions' conduct and the workings of monetary policy. Only the level of the interest rate matters. Given the magnitude and the abruptness of the shifts in interest payments that we are seeing now and that we saw less dramatically in 2016-2018, the monetary policy implications of paying IOR warrant more analysis.

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