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Chairman Huizenga, Ranking Member Moore, and other members of the committee, I am honored to have the opportunity to testify today and share with you my views on several issues concerning the payment of interest on reserves (IOER) by the Federal Reserve System. I will focus some of my remarks on the role that IOER has come to play in the implementation of monetary policy since the Great Recession. But first I want to address certain misconceptions about the Federal Reserve's balance sheet, the role that reserve creation has played in the expansion of that balance sheet, and the payment flows among the banks that hold reserves, the U.S. Treasury, and the Federal Reserve.

The Fed Is a Government Entity, Not a Bank

Before I get to the issue of interest on reserves, I want to address a misperception many have on the proper way to view the Fed's balance sheet. First, though the Fed is often compared to a private sector bank, that analogy simply doesn't hold up and leads to a number of faulty conclusions. There are fundamental differences between the Fed and private sector banks, because the Fed is a government entity whose liabilities are both explicitly and implicitly guaranteed by the government. As the Fed began its asset purchase program, it didn't go out into the market and pay interest on reserves to attract funds as a private sector bank would to gain deposits and other sources of funding. Instead, in order to purchase Treasuries, it paid for them by increasing the seller bank's reserve account, and it did not first have to raise the funds to do so. Had the Fed paid for those Treasuries with currency in the form of Federal Reserve notes, we would have said that the Fed printed money and monetized Treasury debt. The Fed could have made the same asset purchase if the interest rate on reserves (IOER) had been zero, and the Fed's balance sheet would be the same size that it is today.

Second, it is also important to understand that, unlike deposits at a private sector bank, reserves never leave the Fed. A bank can't withdraw its reserve deposits from the system the way a bank depositor can withdraw funds from his or her bank. When a bank or one of its customers engages in a transaction, a reserve deposit moves from one organization to another, ownership of a reserve deposit changes, but the funds never leave the Fed. This is true whether the dollar transaction is domestic or foreign. Even if a bank were to surrender a reserve deposit for currency, the Fed's balance sheet would remain unchanged in size. The Fed's liability in the form of bank reserves would go down, but its liability in the form of Federal Reserve notes outstanding would go up by the same amount – there would be no impact on the overall size of the Fed's balance sheet.

The Fed can shrink its balance sheet *only* by selling assets (which reduces the Fed's Treasury holdings and also reduces bank reserves) or by allowing its assets to mature and not replacing them. In the latter case, the Fed's assets decline, and its liabilities to the Treasury also decline.

How to Think About Interest Payments on Reserves

Now, what about those interest payments on reserves? Remember that the Fed is paid interest by the Treasury on its portfolio holdings (and by Freddie and Fannie, also essentially governmental entities at this point). The Fed extracts its operating costs, including the interest it pays on reserves, and returns the remainder to the Treasury. If this intragovernmental funds transfer between the Fed and Treasury were settled the way interest rate swaps are settled by netting, there would always be a net payment from the Treasury to the Fed.¹ Thus, since the Treasury is covering the Fed's operating costs and interest payments, it is a misnomer to suggest that the Fed is making a profit.

¹ For simplicity, I am including Freddie and Fannie and their liabilities as part of the government here as well.

From the perspective of the consolidated Fed-Treasury balance sheet, Fed asset purchases of Treasuries merely replace one form of government debt with another, extracting long-maturity Treasuries held by the public from the market and substituting a very short-duration demand liability in their place. Fed purchases take higher-cost Treasury debt off the market and replace it with another form of government short-term demand debt paying 50 basis points. This effectively retires securities that were purchased and reduces the cost of debt to the Treasury by the difference between the 50 basis points that is paid on reserves and the coupon rate of the purchased Treasury securities. This transaction also means that Treasury is currently making the 50-basis-point payment on bank reserves instead of the higher-rate payment it would have made on the Treasuries the Fed took off the market. Otherwise, Fed remittances would be higher by the amount of the interest paid on reserves, and the net transfer of funds from the Treasury to the Fed would be lower. Moreover, it is only by a quirk in government accounting that the Treasury can count remittances from the Fed as revenue for budget purposes. This is clearly a case of questionable accounting and is misleading when it comes to the treatment of government revenues.

Are Interest Payments to the Fed a Subsidy to Banks?

Is it correct to view the interest payments on reserves as a subsidy to banks? We have already established that the purchases could have been made even if the payment of interest on reserves was zero. So those interest payments surely look like a subsidy. Why not cut the rate to zero and thus reduce the financing costs to the Treasury to zero on those reserves?

The answer lies in understanding how IOER works. IOER is now one of a suite of operational tools that the Fed has adopted since the Great Recession for the conduct of monetary policy. These tools include not only the IOER but also the reverse repo rate, the term deposit

rate, the discount rate and, to a lesser extent now, the target Fed Funds rate. The target Fed Funds rate was the main tool the Fed used prior to the recent crisis to influence short-term interest rates by setting the rate banks paid to borrow and lend excess reserves in the interbank overnight market. This market has essentially dried up now because the huge volume of excess reserves has eliminated the scarcity of that asset as far as banks are concerned. The other tools, which I am sure others on the panel today will discuss in much more detail, evolved to provide secured access to short-term funds, and in the case of the reverse repo market for example, to a wider range of counterparties that were not able to access the Fed Funds market directly or could not hold reserve balances at the Fed.²

In the wake of the Great Recession, IOER has become an essential tool for the Fed to influence short-term interest rates and inflation. For most of the history of the Federal Reserve, no interest was paid on reserves. But requiring banks to hold a portion of their assets in the form of a non-interest-bearing reserve against their deposits effectively reduced bank earnings and functioned as a tax. As a result, many banks opted out of the Federal Reserve System, and the Fed even resorted to providing free payments services (the equivalent of free toasters) to offset the ongoing cost of membership.

Predictably, banks sought to minimize excess reserves, and one way to do that was to make loans, converting excess reserves into required reserves. For the banking system as a whole, this practice creates a money multiplier and expands the money supply, and during periods of rapid expansion it leads to inflation. Today, for example, one dollar of reserves could theoretically support a tenfold increase in the money supply and potentially trigger an explosion in inflation. This unwelcome prospect explains why economists and some members of the

² These counterparties include commercial banks that aren't primary dealers (both foreign and domestic), GSEs, and money market funds. Freddie and Fannie may hold reserve deposits at the Fed but may not receive interest on those funds.

FOMC are concerned that the Fed needs to wind down its portfolio, decrease the amount of excess reserves, and return interest rates to normal.

In this context, the Fed's ability to pay interest on reserves is critical to reducing the opportunity cost of holding excess reserves. Moreover, it can help significantly to keep interest rates, the money supply, and inflation under control, consistent with the Fed's dual mandate. To be sure, the payment of interest on reserves will go up as policy normalization proceeds, but what is relevant from the government's fiscal perspective is the spread between the market rate on Treasuries in the Fed's portfolio and the rate paid on reserves.

An additional complication arises when we recognize that ownership of excess reserves is not evenly distributed across the banking system according to bank size, as we might guess. A substantial portion of excess reserves are held in U.S. subsidiaries and affiliates of foreign banks. Figure 1 shows the proportions of reserves and deposits in foreign institutions and how those proportions have evolved under Dodd-Frank and as the Fed embarked upon its quantitative easing policies. These institutions now account for 40% of the excess reserves (the figure has been as high as 50%), but they account for only about 10% of deposits. Because of this imbalance, they also receive a disproportionate share of the interest payments on reserves relative to domestic institutions.

There are two explanations for the imbalance. First, the Dodd-Frank Act changed how the deposit insurance assessment is charged. Large banks (mainly those over \$500 billion) now pay more than 15 basis points on total assets. This means that, while they currently earn 50 basis points on their reserves, their net return is 35 basis points. (It was 10 basis points prior to the Fed rate change in December 2015.) In contrast, since foreign banks are not subject to the 15 basis point FDIC assessment, they are able to earn a full 50 basis points on their excess reserves. But

for foreign institutions headquartered in Europe or Japan, for example, where policy rates are negative, the spread between their domestic rate options and the holding of reserves at the Fed is even wider. For a European bank, this spread is now 90 basis points. Such a bank can potentially borrow from its central bank at 25 basis points, or lower, and deposit the funds at the Fed to earn a risk-free 50 basis points at a positive spread. As an additional bonus, reserves held at the Fed by foreign banks count towards their liquidity coverage ratio (LCR) under the Basel III requirements.

These foreign institutions are not likely to intermediate those reserves, nor are foreign banks a threat to suddenly engage in explosive lending in the U.S. This feature, while clearly providing a risk-free arbitrage to foreign institutions, helps to sterilize some 40% of excess reserves, and the impact only increases either as their central banks lower rates even further or as the Fed raises rates.

How Difficult Is the Process Facing the Fed in Reducing Its Balance Sheet?

The Fed faces a challenge managing short-term interest rates with its basket of tools and returning its balance sheet to a new equilibrium. If, as argued earlier, excess reserves are suddenly employed to support an explosion of lending, then the Fed is at risk of being behind the curve in achieving its inflation objective. The Fed has essentially only two options when it comes to reducing the size of its balance sheet. It could start the normalization process by not replenishing assets as they mature and let that process shrink the balance sheet while it simultaneously attempts to control short-term interest rates. Alternatively, it could start selling assets in addition to letting existing maturing assets run off. Each of these options involves different issues and will be considered in turn.

Option 1: Stop Reinvesting

If the Fed were to stop reinvesting, how long would it take for the balance sheet to reach equilibrium? By equilibrium I mean that the portfolio shrinks to a size that its Treasury holdings mainly backs the outstanding currency. Since nominal GDP today is much higher than it was before the onset of the crisis (when the Fed's balance sheet was \$870 billion), equilibrium portfolio size today would be about 7.25% of nominal GDP, or \$1.350 trillion. That number would grow over time at the rate the economy expands, further mitigating the extent that the portfolio needs to shrink from its present \$4.477 trillion size.

The speed with which the Fed could let the portfolio run off and the amount of excess reserves that would then have to be sterilized depends both upon the rate of growth of nominal GDP and upon the maturity structure of the portfolio, which presently consists of various maturities of Treasury obligations totaling \$2.4 trillion and largely 15-year and 30-year MBS. The maturing process is therefore heavily concentrated in Treasuries during the early years. Not rolling over maturing issues would free liquidity in the Treasury market, if the Treasury reissued securities to the public. But the shrinkage would impact the ability of the Fed to engage in reverse repo transactions unless the transactions employed agency MBS, which might or might not be as attractive as collateral. Assuming a 4.5% rate of growth in nominal GDP (2.5% real and 2% inflation), Figure 2 shows that maturing assets alone are not sufficient in the short run to quickly restore equilibrium. The volume of excess reserves that would have to be sterilized is substantial, and the portfolio would not achieve equilibrium until 2029. The scope of the challenge means

that some form of asset sales or perhaps a higher-than-desired interest rate policy would likely have to be pursued.³

Option 2: Sell Assets in Addition to Allowing Maturing Issues to Run Off

The foregoing analysis suggests that some form of asset sales will probably have to be employed as a supplemental measure while the Fed's portfolio is being restored to equilibrium. Again, this strategy raises additional consequences to consider. First, despite the Fed's reluctance to engage in sales of its MBS assets, there actually aren't sufficient assets in the portfolio that could be sold in order to achieve equilibrium. Assets in addition to Treasuries would have to be sold. Second, the problem with asset sales in general is that the Fed has booked its purchases at face value. Should interest rates rise, the market value of those assets would decline, so that asset sales would then take place at a loss, which would have to be booked. Given the duration of the Fed's assets and capital, I estimate that it would take less than a 20 basis point increase in interest rates across the board essentially to make the Fed's portfolio market value insolvent. This means that the Fed has virtually no flexibility to sell assets without wiping out its capital.

Federal Reserve accounting conventions anticipate the possibility that asset sales might give rise to losses greater than income. Normally, such losses would be recognized against capital, but Fed accounting rules state that such losses would not have to be written down against the Fed's equity. Rather, the Fed would create a deferred (or negative) asset account, similar to

³ The Fed would also have to have sufficient holdings of Treasuries to meet the statutory requirement to back outstanding currency. MBS might have to be liquidated or swapped to accommodate this requirement.

an accounting mechanism used by some companies accounting for loss carry forwards.⁴ Asset sale losses would be booked into that account, and future portfolio earnings would be used to write down those losses before remittance could be resumed.

Impending Risks

The potential costs and reputational risks that asset sale losses pose to the Fed are twofold. First, Fed insolvency becomes totally transparent when the deferred asset account exceeds the Fed's capital. While economists might argue that book insolvency is irrelevant to the Fed since it is part of the government and is ultimately backed by U.S. taxpayers, we must wonder what the world's reaction would be to the insolvency of the world's most prestigious central bank.

Second, Congress recently exacerbated the problem at hand when it raided the Fed's surplus account and cut dividends to regional reserve bank stockholders in the December Highway Transportation Act. Congress reduced the Fed's capital and surplus by \$20 billion and capped its future surplus at \$10 billion. Consequently, the Fed's total capital on account is now only \$30 billion. Moreover, as the economy and the Fed's balance sheet grow in tandem, Fed leverage will increase and so will its risk of insolvency. Taking the surplus amounts to printing money to finance highway construction. That is, the actual transaction involves writing down the Fed's surplus account and increasing the Treasury's balance at the Fed. When the funds are spent, a reserve account is created and the Treasury's balance declines. This amounts to printing

⁴ See Carpenter, Seth, Jane Ihrig, Elizabeth Klee, Daniel Quinn, and Alexander Boote, "The Federal Reserve's Balance Sheet and Earnings: A Primer and Projections," Board of Governors of the Federal Reserve System, January 2013. "The deferred asset is subsequently realized as a reduction of future remittances to the Treasury (which are accounted for as interest on Federal Reserve notes expense). Thus, it is an asset in the sense that it embodies a future economic benefit that will be realized as a reduction of future cash outflows. If the realization of the asset is expected to occur over several years, some valuation technique, such as net present value, would be applied to measure the value of the asset. This accounting treatment is consistent with U.S. GAAP and is similar to the way that private companies report deferred loss carry forwards as an asset."

money to finance government projects. Gimmicky accounting has conjured the illusion of providing funding for fiscal projects without paying the true costs. In the process, Congress may have damaged the Fed's ability to do its job.

Conclusion

In closing, I want to reiterate some of the key points I've made today. First, when we think about the Fed, it is important to consider it as part of the government and not a private sector entity, despite its unusual structure. Second, the Fed can't make a profit. Rather, it issues one form of government debt for another. It receives interest payments from the government, takes out its operating costs, and returns the remainder to the Treasury. On balance, there is always a net payment from the Treasury to the Fed, and it is inappropriate to consider remittances as income for budget purposes, as is the present practice. Third, it follows that interest on bank reserves is really a payment from the Treasury to the holders of bank reserves – a demand liability. Fourth, the ability to pay interest on reserves functions as an important tool of monetary policy and should not be viewed as a mere subsidy, just as interest payments on Treasury debt are not regarded as a subsidy. IOER will be needed to play a key role in sterilizing bank reserves as the Fed begins to wind down its balance sheet. Further, IOER will be a critical tool the Fed can use to avoid having to liquidate assets at a loss. Finally, Congress should reevaluate its policy towards the Fed's surplus and capital.

