

# The Costs of High Levels of Reserve Balances

Bill Nelson | Jan. 25, 2021

The Federal Open Market Committee meets tomorrow and the day after tomorrow to discuss the state of the economy and the stance of monetary policy. At its last meeting, in December, the Committee renewed its promise to keep its target range for the federal funds rate at 0 to ¼ percent “until labor market conditions have reached levels consistent with the Committee’s assessments of maximum employment and inflation has risen to 2 percent and is on track to moderately exceed 2 percent for some time.” The FOMC also added a promise to continue to expand its holdings of Treasury securities and agency mortgage-backed securities by \$80 and \$40 billion a month, respectively, until “substantial further progress” was made toward meeting its inflation and employment objectives. The FOMC won’t change either of these promises in the post-meeting statement, but the members are surely discussing their outlook for asset purchases and assessing their costs and benefits in their meeting.

Back in the Teens, the Fed’s Large-Scale Asset Purchases (or more commonly “QE”) programs involved purchasing longer-term securities, and the Fed said then that the benefit was that the purchases pushed down longer-term interest rates by taking those securities out of public hands. (Less supply of longer-term securities = higher prices of longer-term securities = lower longer-term rates.) The benefit of the current purchases, which include acquisitions across the curve and are skewed toward shorter maturities, is harder to explain. The Fed asserts that the purchases “help foster smooth market functioning and accommodative financial conditions...” but the mechanism through which the purchases accomplish those objectives is unclear.

The costs of the purchases, on the other hand, are easier to grasp and are mostly the result of the increased reserve balances (deposits of commercial banks and other depository institutions at Federal Reserve Banks) that the purchases create. The Fed’s assets are mostly Treasury securities and agency MBS, its liabilities are mostly cash, the deposit of the Treasury (the Treasury General Account or “TGA”) and reserve balances on which it pays interest. Currency and the Treasury deposit are not affected by asset purchases; as a result, so that the Fed’s balance sheet balances, when its securities holdings go up, reserve balances go up, dollar for dollar. Prior to the financial crisis of 2007-09, reserve balances were less than \$10 billion (with a “b”). After all the QE programs, reserve balances peaked at \$2.7 trillion (now with a “t”) in 2014. Currently, reserve balances are \$3.2 trillion and heading higher.

How much higher? A lot higher, for two reasons. First, the asset purchases show no sign of slowing down. While it is unknowable when the FOMC will decide the conditions for slowing its purchases have been met, recent comments by FOMC participants suggest they expect the purchases to continue through 2021. That, by itself, would provide a \$1.44 trillion boost to reserve balances. And once its goals have been met, the Fed has promised to taper the purchases slowly while continuing to reinvest principal payments. If they taper over six months, that would be another \$360 billion. Second, the TGA is currently \$1.6 trillion, far above the \$300 billion it averaged for the few years before the pandemic. Because the TGA is a liability—a source of funding for the Fed—when it falls, reserve balances must go up by a corresponding amount. On the other hand, currency (also a source of funding for the Fed) can reasonably be expected to grow about \$100 billion a year, reducing reserve balances.

Adding it all up, reserve balances are on course to be \$5.85 trillion by the middle of 2022, more than twice their level when they peaked after QE3.<sup>1</sup>

## What Would Be the Consequences of Such High Levels of Reserve Balances?

If the Fed ends up with \$5.85 trillion in reserve balances, there will be at least two important consequences: (1) several bank regulatory capital ratios will fall across the industry, and banks will be incentivized to reduce the supply of bank credit with the result that GDP will be lower; and (2) the Fed will need to pay an above-market rate of interest on its liabilities to raise overnight money market rates once it decides that such an increase in rates is warranted.

### CAPITAL CONSEQUENCES

The primary capital requirements of banks are calculated as ratios of capital to risk-weighted assets. Since reserve balances have no risk, they get a zero weight. As a result, those requirements are not affected by a rise in reserve balances. The increase in reserve balances does, however, worsen bank performance in the annual stress tests noticeably because higher assets are assumed to imply higher noninterest expenses even if those assets are just deposits at the Federal Reserve.

There are four capital requirements, however, that are calculated as ratios to unweighted assets and so are affected by a rise in reserve balances. *The banking system as a whole must hold whatever level reserves the Fed establishes, so, unless banks reduce other assets (such as loans) by an amount equal to the rise in reserve balances, these capital ratios must fall, on average, as reserves rise.*

First, there is the supplementary leverage ratio or SLR, the leverage ratio requirement included as part of Basel III. Bank holding companies generally have to maintain an SLR of at least 3 percent, and Global Systemically Important Bank (GSIB) holding companies in the United States have to maintain an eSLR (“e” is for “enhanced”) of 5 percent. The SLR is calculated as the ratio of Tier 1 capital (essentially common equity plus preferred stock) to total leverage exposure (assets plus certain off-balance-sheet exposures). In April, the Federal Reserve temporarily excluded reserve balances as well as Treasury securities from the measure of total leverage exposure, but that exclusion is set to expire in March 2021.

Second, there is a 6 percent SLR that has to be satisfied at the commercial bank subsidiary level. In May 2020, the banking agencies told banks that they can exclude reserves and Treasuries, but if a bank chooses to do so, its regulator gets to veto any dividend payments to its parent holding company. Not surprisingly, only two banks have signed up. That exclusion also expires in March.

Third, banks also have to meet a tier 1 Leverage Ratio requirement of 5 percent. The tier 1 leverage ratio requirement is calculated as the ratio of tier 1 capital (defined above) to average tangible assets (assets minus intangible assets like goodwill). Average tangible assets include reserve balances, so as reserve balances go up, tier 1 leverage ratios decline.

Fourth, the increase in reserve balances will also likely boost GSIB surcharges, the extra capital required of the largest banks. While some of the added reserve balances will likely end up at smaller banks and U.S. branches of foreign banks, given GSIBs’ importance in the U.S. banking system, GSIBs will end up with a lot of the reserves. Each GSIB’s capital surcharge is based on a score that depends on different measures of the bank’s systemic

<sup>1</sup> As explained in [“Probability and consequences of stratospheric consequences of reserve balances,”](#) judging by the Fed’s forecasts and its estimates of uncertainty around those forecasts, there appears to be at least a 20 percent chance the balance sheet expansion will continue its current pace at least two years longer than assumed here. If so, reserve balance would reach \$8.2 trillion by the end of 2023 and still be rising rapidly.

importance. One of those measures is size, and another is short-term wholesale funding. As banks' reserve balances go up, they can either make room by reducing other assets (such as Treasury securities or Treasury reverse repos) or fund the balance sheet expansion by expanding deposits or other liabilities, or, most likely, a mix of both. To the extent that GSIBs do not completely offset the rise in reserve balances with reductions in other assets, their size will go up, raising their GSIB surcharges. To the extent that the increase is funded with short-term wholesale funding, including deposits of the financial institutions selling their Treasury securities and MBS to the Fed, GSIB surcharges will go up further. If GSIBs make room for the added reserve balances to a partial extent by reducing their holdings of close substitutes such as reverse repos or T-bills, the increase in their GSIB surcharges would be smaller. A reduction in the demand for Treasury securities and in the supply of financing for Treasury securities, however, might both push up Treasury rates and make it more difficult for the Fed to stop its Treasury purchases.

Pressure on banks' capital situations has two likely consequences. First, as is widely found in economic analyses of optimal levels of capital, banks will reduce lending to nonfinancial businesses and households.<sup>2</sup> For example, in "[Calibrating the leverage ratio](#)," Ingo Fender and Ulf Lewrick, two economists at the Bank for International Settlements, estimate that the reduction in credit supply resulting from an SLR of 5 percent reduces the level of GDP each year by 0.37 percent while an SLR of 6 percent reduces GDP by 0.63 percent.<sup>3</sup>

Second, the broker-dealer subsidiaries of bank holding companies may be less able to act as market-makers or provide repo financing. We estimate that as reserve balances rise, for many banks their most binding capital requirement will be a leverage ratio requirement rather than a risk-weighted capital requirement. To be a market maker in Treasury securities requires holding a stock of Treasury securities, and that stock reduces a bank's leverage ratio. Providing repo financing also, of course, reduces a bank's leverage ratio. Not only will banks need to economize on those assets to comply with leverage requirements, they will have an incentive to substitute away from those relatively low-risk assets toward riskier assets because doing so requires no more capital at the margin for purposes of meeting leverage ratios but produces higher returns. The resulting decline in market liquidity and decline in demand for Treasury securities both from banks directly as well as from those they provide financing will put upward pressure on Treasury rates and reduce Treasury market liquidity, outcomes that are directly opposite the Fed's stated objectives for its asset purchases.

It is worth noting, as we did in "[Excluding Reserves from the Leverage Ratio Would Make Repo Market Volatility Worse](#)" in October 2019, that excluding reserve balances alone from banks' leverage ratios could make the situation worse rather than better. If reserve balances but not Treasury securities were excluded, then banks would have a strong incentive to substitute away from Treasuries and Treasury reverse repos, which carry a leverage ratio charge, into reserve balances, which wouldn't.

#### SPREAD BETWEEN FED POLICY INTEREST RATES AND MARKET INTEREST RATES

Although the banking system as a whole must hold the quantity of reserve balances necessary to make the Fed's balance sheet balance, each bank individually can freely choose to hold whatever level of reserve balances it prefers. To make demand equal supply, market interest rates have to shift relative to the Fed's policy interest rates to leave banks individually choosing to hold balances that add up to the total supply of balances. That, in a nutshell, is how monetary policy works. While it seems magical, the same thing happens whenever prices adjust to

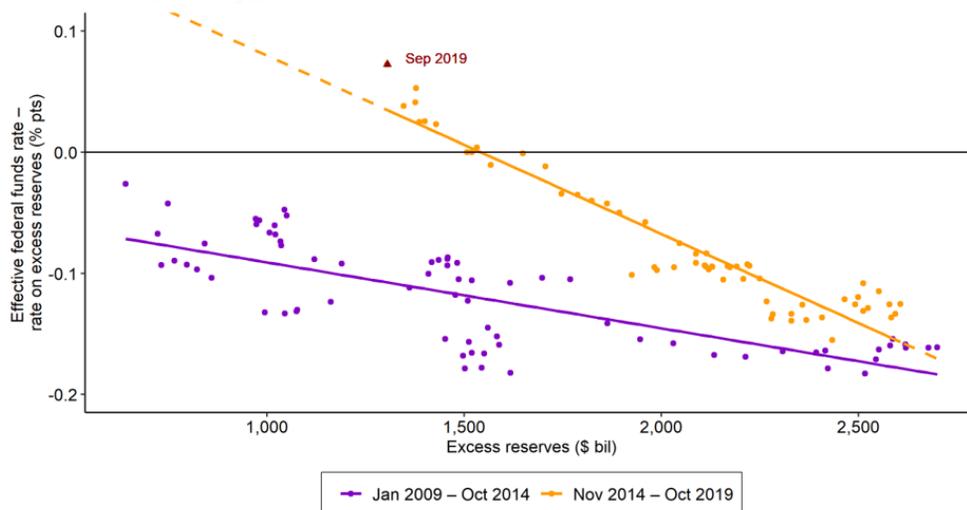
<sup>22</sup> The Bank of England, the Federal Reserve Board, the IMF, the Minneapolis Fed and the Bank for International Settlements have all published estimates of the optimal level of bank capital requirements based on estimates of the decrease in bank credit supply resulting from an increase in requirements and the corresponding reduction in GDP.

<sup>3</sup> Fender and Lewrick also estimate the benefit of a higher leverage ratio in the form of reduced probability of a financial crisis and estimate that an optimal leverage ratio requirement should be in the range of 4 to 5 percent. That finding is for banks with historically normal balance sheets, not banks holding record high levels of riskless reserve balances.

match supply and demand in any market. In two recent blog posts—“[When the Fed Buys a Treasury Security, the Debt Does Not Go Away](#),” and “[Does Excluding Reserves from the Leverage Ratio Make Quantitative Easing More Effective? More Yes than No](#)”—we consider the impact of Fed asset purchases using a simple model that may provide more intuition for how the process works.

With reserve balances of \$5.85 trillion, banks (large banks, small banks, thrifts, credit unions and U.S. branches and agencies of foreign banks) will be overstuffed with reserves and will need a fairly strong incentive to choose to hold them, in part because of the capital consequences discussed above. In particular, the interest rate the Fed pays on reserve balances (the “IORB rate”) will have to be sufficiently elevated relative to other money-market rates to make reserve balances an attractive investment relative to substitutes. While that effect is muted when all the rates are constrained by the zero lower bound, as is the case currently, based on the behavior of short-term rates under previous QEs, the ultra-high level of reserve balances could require an IORB rate well above the fed funds rate to achieve liftoff once the FOMC decides that raising rates is appropriate. For example, as shown in the chart, when reserve balances were \$2.7 trillion, the Fed had to pay interest on reserves 17 basis points above the fed funds rate to hit its monetary policy target.

The purple dots show the relationship between reserve balances and the fed funds–IORB rate spread when the Fed’s balance sheet was growing under the QE programs. Extrapolating that relationship suggests the spread would have to be deeply negative to support reserve balances of \$5.85 trillion at liftoff. If, for example, the spread were 35 basis points, twice the level needed when reserve balances were half as large, the Fed would have to pay \$20.5 billion in interest on reserve balances annually over and above market rates.



The necessary spread could be reduced if the Fed set the interest rate it pays on overnight reverse repos (the ON RRP rate) equal to the IORB rate and lifted the caps on participation in the program. To help control interest rates despite elevated levels of reserve balances, the Fed created the ON RRP facility in 2014. The facility provides primary dealers, money market mutual funds and GSEs a standing offer to invest in the Fed in the form of an overnight reverse repurchase agreement, helping to put a floor on interest rates. The facility has a counterparty limit of \$30 billion. The ON RRP rate is currently 0 percent, 10 basis points below the IORB rate. If the Fed set the ON RRP rate equal to the IORB rate when it was trying to raise money market rates, the necessary spread between the policy rates and money market rates would likely be smaller than if the Fed maintained the current spread

between the two policy rates for two reasons. First, the forces of arbitrage would be stronger because money market funds, GSEs, FHLBs and broker-dealers have access to the ON RRP facility while only commercial banks (and other depository institutions) earn interest on reserve balances. Second, the resulting growth in reverse repos (a Fed liability) would lower reserve balances, reducing the spread between the IORB rate and market rates needed to get banks to hold the balances.

If, however, the Fed lifted the caps on the ON RRP program, it would be undoing a safeguard it put in place to ensure that the program did not reduce financial stability. In particular, when the FOMC debated whether to include the program as part of its toolkit for controlling the fed funds rate when reserve balances are high, it was concerned that investors would flood into the facility in a flight to quality in stress periods, pulling needed capital out of the economy. When briefing the FOMC on the importance of the caps in June 2014, Fabio Natulucci, Associate Director of the Division of Monetary Affairs, stated that the

“...caps are designed to prevent a disruptive surge in take-up at the facility over a short period, which could be associated with a loss of short-term funding for financial institutions and nonfinancial firms, and to provide policymakers with some time to assess conditions and to determine whether additional responses are warranted.” (see the [transcript of the June 2014 FOMC meeting](#), p. 29)<sup>4</sup>

## Conclusion

As the FOMC contemplates the future of its asset purchases tomorrow and the day after tomorrow, it should do so with a clear understanding of their costs. Under what appears to be the Committee’s baseline outlook, the purchases, combined with a normalization of the TGA, will result in reserve balances of approximately \$5.85 trillion by mid-2022, more than twice the swollen level achieved when the Fed finished QE3 in 2014. The stratospheric level of reserve balances will lower banks’ capital ratios and raise their capital requirements. Those capital pressures will reduce GDP, raise longer-term interest rates and impair Treasury market functioning, outcomes in direct opposition to the FOMC’s stated objectives for the purchases. Moreover, when the FOMC eventually decides it is appropriate to increase interest rates, the high level of reserve balances will require the Fed to pay an above market interest rate on reserve balances. While impossible to quantify with any precision, the added interest expense could reasonably be expected to be more than \$20 billion a year.

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*Disclaimer: The views expressed do not necessarily reflect those of the Bank Policy Institute’s member banks, and are not intended to be, and should not be construed as, legal advice of any kind.*

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<sup>4</sup> The FOMC could of course decide that those financial stability risks are not material and that it can therefore lift the counterparty limits. If it does so, however, it should revise its notice of proposed rulemaking (available [here](#)) to pay lower rates of interest on the deposits of banks established for the purpose of taking wholesale deposits and investing in reserve balances. The Board asserts that the banks pose the same financial stability risk as an uncapped ON RRP facility – the banks would facilitate flights to quality. The Board states:

The Board believes, however, that the emergence of PTIEs [“pass-through investment entities”] likely would have negative financial stability effects on net. Deposits at PTIEs could significantly reduce financial stability by providing a nearly unlimited supply of very attractive safe-haven assets during periods of financial market stress...As a result, in times of stress, investors that would otherwise provide short-term funding to nonfinancial firms, financial institutions, and state and local governments could rapidly withdraw that funding from those borrowers and instead deposit those funds at PTIEs. The sudden withdrawal of funding from these borrowers could greatly amplify systemic stress.

Narrow banks that invest only in reserve balances are likely to be quite profitable when the Fed eventually determines that it is appropriate to raise interest rates because, as discussed above, it will have to pay an above-market interest rate on those deposits.