BANK POLICY INSTITUTE

The Reverse Repo Bank

Francisco Covas, Katie Collard & Brett Waxman | August 9, 2022

The Federal Reserve is currently obtaining a significant share of its funding through overnight reverse repurchase agreements with money market mutual funds.[1] The surge in borrowing from MMFs started in March 2021 when the Federal Reserve ended its temporary exclusion of reserve balances and U.S. Treasuries from the denominator of the supplementary leverage ratio that applies to large U.S. banks. Thus, the reason why the Fed is borrowing over $2 trillion from money funds is bank capital requirements, in particular leverage capital requirements.

In this post we show that the leverage ratio continues to be a key factor discouraging banks from holding riskless reserve balances. More precisely, the largest banks would have to hold an additional 6 percent in capital to absorb outstanding balances held by money market funds. We show that reserve balances inflate banks' *risk-based* capital buffers in multiple ways, described below. (Of course, this is counterintuitive and problematic, given that reserve balances are a riskless asset from both a credit risk and liquidity risk perspective.) Therefore, even if the Fed makes changes to banks' capital requirements to ensure that the supplementary leverage ratio (SLR) serves as a backstop to risk-based capital requirements, global systemically important banks (GSIBs) would likely continue to limit low-risk, balance-sheet-intensive activities, such as making markets in Treasuries or meeting demands from others for repo financing for Treasuries.

As the Federal Reserve reduces its nearly $9 trillion balance sheet through quantitative tightening (QT), it will be transferring a large amount of its holdings of Treasury and agency mortgage-backed securities back to private investors. However, with a banking system that has its intermediation capacity reduced by regulatory distortions, funding pressures and market volatility are likely to reemerge. For these reasons, the Fed could be forced to curtail QT before it has brought inflation under control or become regularly the "market maker of last resort" in the Treasury and potentially other fixed income markets. In addition, the Fed would have less room to use its balance sheet in the next recession or crisis and would thereby face more challenges to employing quantitative easing policies.

The Overnight Reverse Repo Facility

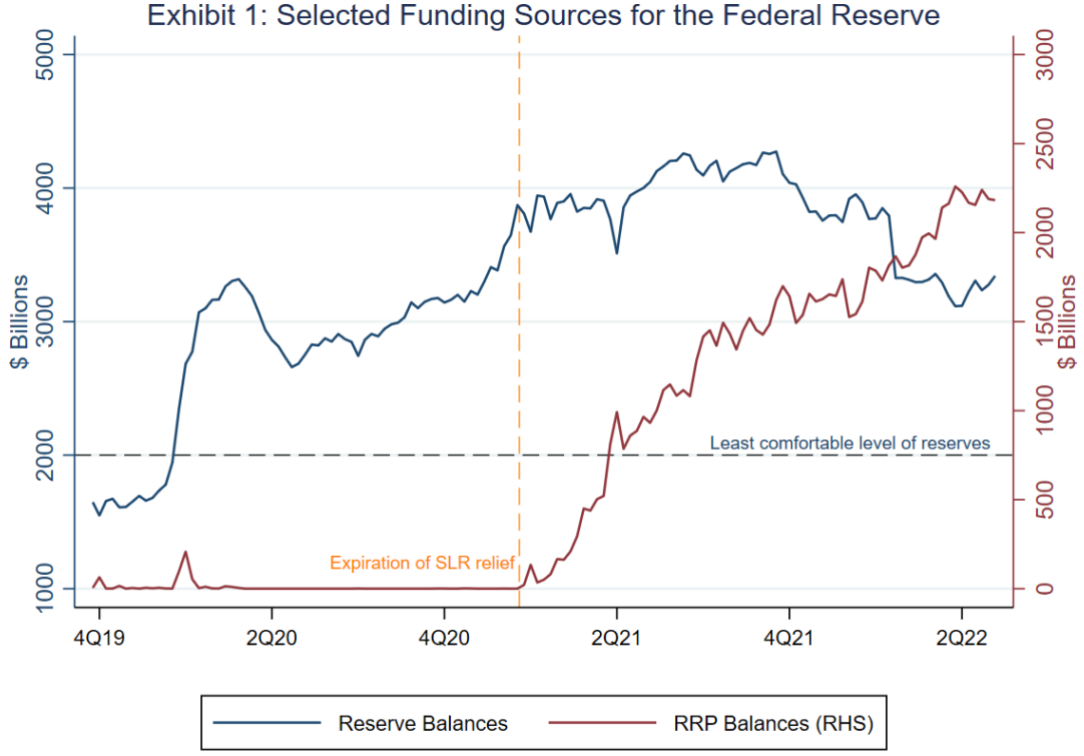
The Federal Reserve introduced the overnight reverse repo facility (ON RRP) in 2014 to improve its control of the federal funds rate. The set of counterparties eligible to participate in the ON RRP is quite broad and includes banks, MMFs, government-sponsored enterprises (GSEs) and primary dealers. MMFs and the GSEs have accounted for almost all ON RRP take-up. The ON RRP facility helps the Federal Reserve set a floor on the fed funds rate because the Fed controls the interest rate that MMFs and GSEs earn on their excess holdings of cash. More precisely, by

[1] We will follow the Fed's convention and refer to these transactions from the perspective of the counterparty. The counterparties to the ON RRP facility are engaging in reverse repos, a collateralized loan. The Fed is engaging in repos, a borrowing.

setting the ON RRP rate close or equal to the lower bound of the federal funds rate target range, the Fed effectively sets a hard floor (at least, to date) for the policy rate.[2]

In April of 2020, the Fed temporarily excluded reserve balances and U.S. Treasury securities from the denominator of the SLR. The exclusion was intended to encourage banks to increase low-risk, balance-sheet-intensive activities, such as making markets in Treasuries or offering repo financing to others to support trading in Treasuries, which SLR requirements otherwise would have effectively limited. These temporary exclusions were universally viewed as an effective response to the severe Treasury market dysfunction that had emerged in March 2020. In March 2021, the Fed announced the expiration of the exclusions of reserve balances and U.S. Treasuries from banks' SLRs. As a result, banks started to push some of their clients out of deposits and into MMFs. Take-up at the ON RRP surged from about zero to $1 trillion in five months, **as shown in Exhibit 1**. As of the end of July 2022, RRP balances (excluding the foreign cash pool) were near $2.2 trillion.

Exhibit 1: Selected Funding Sources for the Federal Reserve



Source: Federal Reserve Board, Factors Affecting Reserve Balances, H.4.1.

Meanwhile, reserve balances remained little changed from the expiration of the SLR relief until the end of 2021. Since then, reserve balances have declined $700 billion, with most of the decline occurring around tax days as funds poured into the Treasury's account at the Fed. The sharp decline in reserve balances even before the start of QT is relevant because the Fed's stated goal is to reduce its balance sheet as much as possible while maintaining ample reserve balances. The definition of ample reserves depends on market conditions, but it roughly corresponds to the level of reserve balances that does not require frequent interventions by the Fed to add or remove liquidity to short term funding markets. For example, during the repo market turmoil in September 2019,

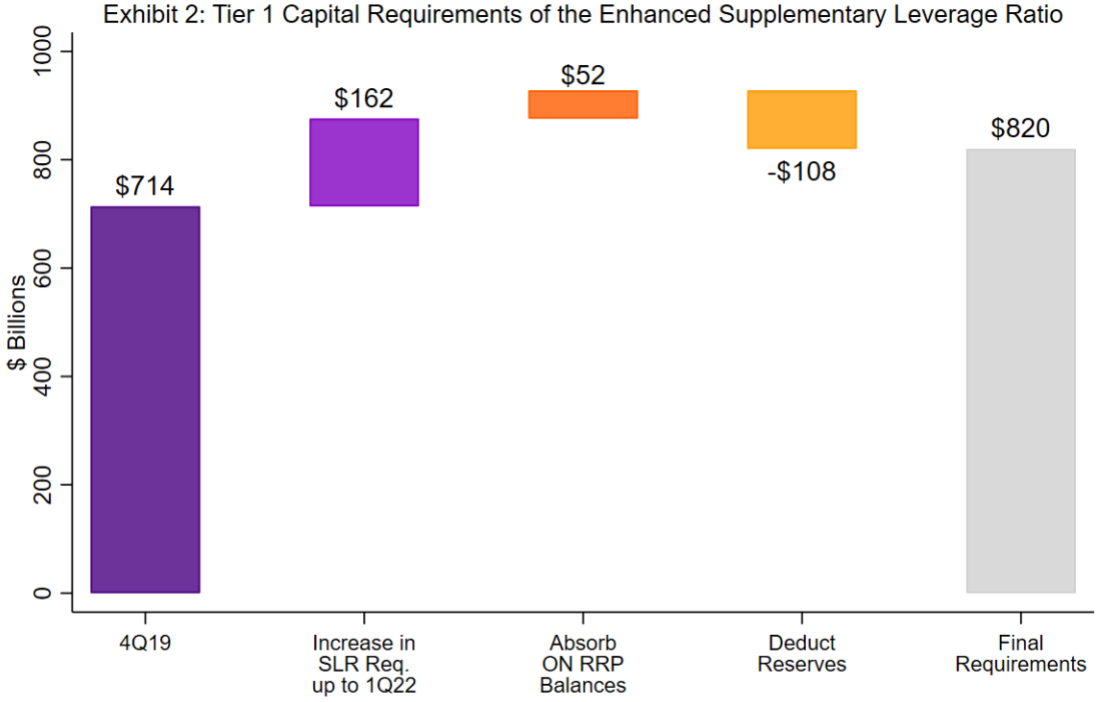
[2] Without an ON RRP facility, the effective federal funds rate would be below the IORB and no guarantee that it would stay within the Fed's target range. This results largely from the GSEs ability to lend to banks in the federal funds market but not being able to earn IORB.

the level of reserve balances—around $1.4 trillion—was not deemed ample. The level below which reserve balances are no longer deemed ample—the "least comfortable level of reserve balances"—is currently probably somewhere around $2 trillion.[3] If reserve balances continue to decline at the current pace, money market rates will have to adjust and RRP balances will start falling as a result (see here for more details).

Reserve Balances and Leverage Requirements

Partially because of increased reserve balances, capital requirements of the largest banks have increased materially over the past 2 years. The most obvious way in which reserve balances contribute to capital requirements is through the SLR. The tier 1 capital requirement through leverage requirements was $714 billion in aggregate for the eight U.S. GSIBs at the end of 2019, **as shown in Exhibit 2**. During the pandemic, an increase in the size of bank balance sheets resulted in an additional $162 billion, or 23-percent increase, in tier 1 capital requirements.

Exhibit 2: Tier 1 Capital Requirements of the Enhanced Supplementary Leverage Ratio



Source: Federal Reserve Board, BPI staff calculations.

Note: Sample includes all 8 U.S. GSIBs. Custody banks already deduct reserve balances from the SLR denominator.

Hypothetically, if the ON RRP facility did not exist (or it was reduced to zero), the reserve balances of largest banks would increase, because they would be left holding a share of the $2.2 trillion in RRP balances that are currently held by MMFs as loans to the Fed. During the first year of the COVID pandemic, the largest banks absorbed nearly half of the increase in reserve balances (smaller banks absorbed the other half, since only banks may hold reserve

[3] In "Open Market Operations During 2021", published in May 2022, The Federal Reserve Bank of New York assumes that the level of reserves needed in an ample reserves regime is 8 percent of nominal GDP.

balances). If we assume the GSIBs (the banks subject to the enhanced SLR) would absorb half the RRP balances, then capital requirements associated with the SLR would rise an additional $52 billion.

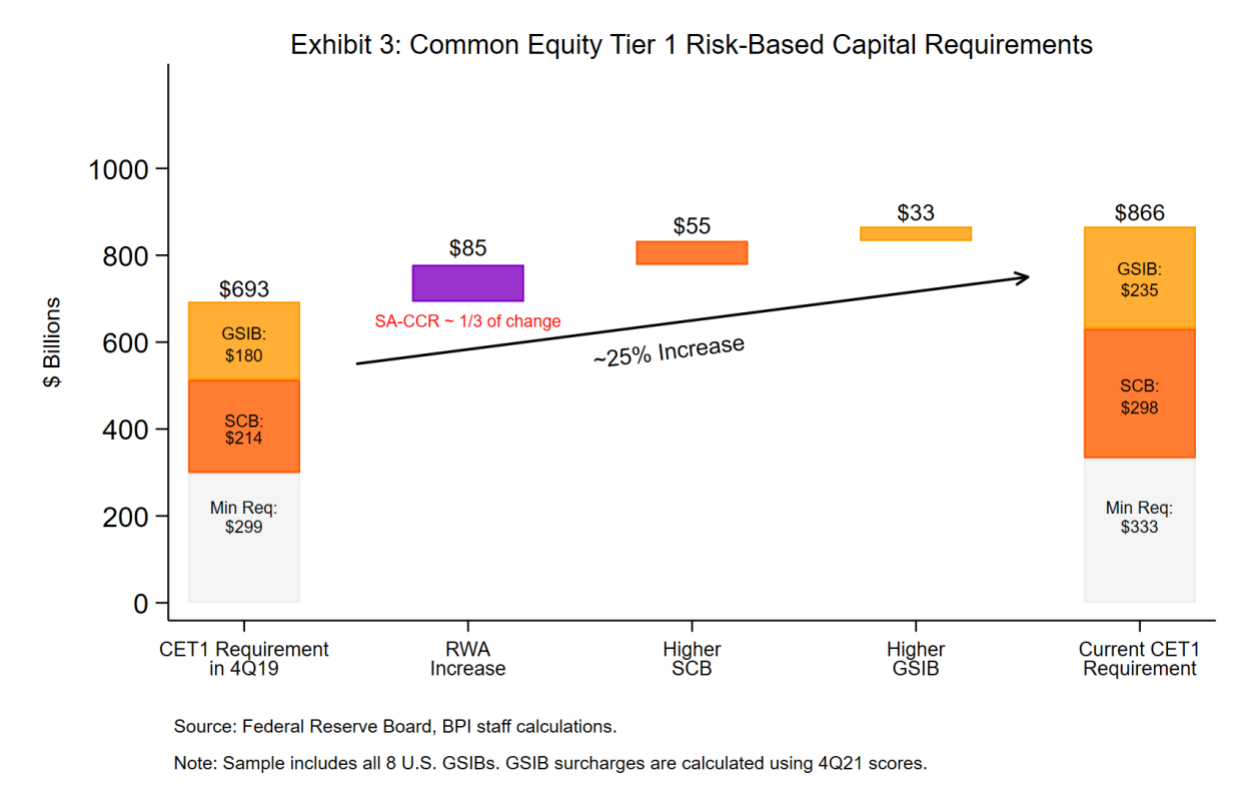
The Fed could offset this increase in capital requirements by deducting reserve balances from the SLR denominator as it did at the outset of COVID. This would reduce the SLR requirement by $108 billion to around $820 billion and put the SLR back into its intended position as backstop to risk-based requirements. In particular, deducting reserve balances from the SLR denominator would increase balance sheet capacity to help intermediate the transfer of Treasury securities and agency MBS to private investors.

Reserve Balances and Risk-Based Requirements

Leverage requirements do not distinguish among bank assets based on risk, so the amount of regulatory capital required to make a loan to a private entity firm or to the Federal Reserve is the same. Risk-based capital requirements are less obvious, but nearly as significant, in contributing to increases in capital requirements associated with reserve balances. Although reserve balances are an asset with a zero risk weight, increases in bank size from risk-free assets still affect risk-based requirements through capital buffer requirements. First, bank size accounts for 20 percent of the GSIB score and the corresponding capital surcharge, meaning that increases to bank size—even from risk-free assets—increases GSIB surcharges. Also, when the Fed purchases assets from the public, the banking sector holds the reserve balances, and the public holds more deposits at banks. Some of those deposits are considered non-operational and therefore also increase the short-term wholesale funding component of the GSIB surcharge score.[4] Second, bank size is an important determinant of expenses and operational risk losses in the Federal Reserve's stress tests. In general, higher holdings of reserve balances inflate noninterest expenses more than they overstate the projections of revenue components. This results in higher stress losses and therefore higher stress capital buffer requirements.[5]

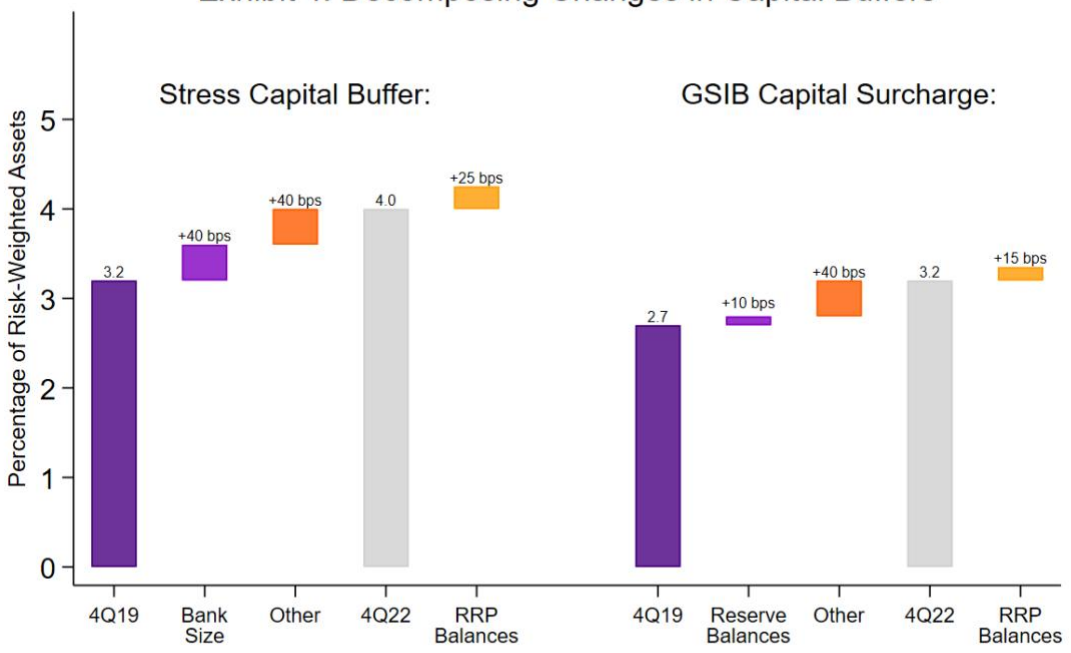
Like leverage requirements, the increase in the largest banks' risk-based requirements has also been significant during the past two years. **As shown in Exhibit 3**, the CET1 capital requirements of the eight U.S. GSIBs have increased about 25 percent over the last 2 years. Higher levels of risk-weighted assets only account for about half of this increase. The other half is due to increases in the stress capital buffer and the GSIB surcharge, which are both linked (at least partially) to the increased reserve levels during this period.

[4] See here for additional details.
[5] The GSIBs also need to maintain minimum ratios of eligible long-term debt as a percentage of total leverage exposure per their total loss-absorbing capacity requirements. The analysis in this note does not include the costs associated with the issuance of additional long-term debt which banks would also have to comply if they were to absorb the outstanding RRP balances.



The adoption of the standardized approach to counterparty credit risk (SA-CCR) and the pickup in loan demand since late 2021 have pushed risk-weighted assets even higher. Based on banks' own reports during their earnings calls, about one-third of the increase in risk-weighted assets is explained by the adoption of SA-CCR by the GSIBs. In addition, both the stress capital buffer and GSIB capital surcharge have also moved up significantly. The average SCB of the GSIBs has increased 80 basis points relative to 2020, and the GSIB surcharge has risen 50 basis points. Banks have up to two years for the higher GSIB surcharge to become effective. However, they must plan for these heightened capital requirements before they take effect.

Exhibit 4: Decomposing Changes in Capital Buffers



Source: Federal Reserve Board, BPI staff calculations.

Note: Sample includes all 8 U.S. GSIBs.

As shown in Exhibit 4, the average SCB of GSIBs increased 80 basis points over the past 2 years. We estimate that at least half of the increase, or 40 basis points, is explained by increases in bank size. The 40-basis-point increase in the SCB is equivalent to the post-tax increase in operational-risk losses in DFAST 2022 relative to DFAST 2020 as a share of risk-weighted assets. Therefore, this is not an unreasonable estimate, but it also includes the effect of the increase in other high-quality liquid assets in bank size.

To estimate the effect of reserve balances on the GSIB surcharge, we apply the coefficients on size and short-term wholesale funding for each entity to estimate the share of the increase in reserve balances on the aggregate score.[6] Our analysis indicates that about 20 percent of the increase in GSIB scores is explained by the increase in reserve balances relative to 4Q19. During the past 2 years the GSIB surcharge rose about 50 basis points on average, so 20 percent corresponds to 10 basis points.

If the largest banks were left holding about half of the $2.2 trillion in RRP balances, the additional $1.1 trillion in assets would increase the average GSIB surcharge by another 15 basis points. Moreover, we estimate that the corresponding increase in bank size could result in an additional 25-basis-point increase in bank SCBs. Taken together, if large banks were to absorb nearly half of RRP balances, risk-based capital requirements would increase by roughly 40 bps, or another $30 billion in common equity tier 1 capital.

[6] More precisely, the adjustment for short-term wholesale funding deducts reserve balances from the numerator of this indicator. The weight on reserve balances is set to be the same average weight across all STWF tiers and remaining maturities of each bank.

Conclusion

Capital requirements of banks have been significantly increasing over the past 2 years, with both leverage and risk-based requirements rising about 25 percent. Given these balance sheet pressures, it is not surprising that money market funds have been absorbing some of the excess deposits at banks and are investing those funds in the ON RRP facility. We estimate that the $2.2 trillion in RRP balances is currently saving the largest banks $50 billion in tier 1 capital. Moreover, even if reserve balances were eliminated from leverage requirements, absorbing half of RRP balances would result in $30 billion more in common equity tier 1 capital requirements for the largest banks through higher risk-based capital buffers.

To increase banks' ability to intermediate low-risk, balance-sheet-intensive activities, such as making markets in Treasuries or offering repo financing to others to support trading in Treasuries, the Fed should exclude reserve balances from all capital requirements: leverage ratios, the GSIB surcharge, and the Fed's stress testing models that calculate the SCB.

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