WELLS FARGO

Special Commentary — October 16, 2023

The Fed's Balance Sheet: How Much Further Can QT Run?

Summary

- The FOMC looks to be near, if not already at, the end of its rate hiking cycle. However, policy tightening is likely to continue in the coming months as the Fed shrinks its balance sheet, a process known as "quantitative tightening" (QT).
- Since the Fed stopped reinvesting securities on its balance sheet in June of last year, the central bank's assets have shrunk by roughly $1 trillion to $7.9 trillion at present. The lion's share of the reduction has been through lower holdings of Treasury securities (down $841 billion), while mortgage-backed securities (MBS) have fallen by $228 billion. Partially offsetting these declines has been a rise in lending related to the emergency programs created in response to regional bank failures in March.
- A reduction in assets must be matched by an equivalent decline in liabilities. The primary channels for shrinking liabilities via QT occur through bank reserves and reverse repurchase agreements. Since QT began, bank reserves have fallen by a scant $17 billion. By far the biggest reduction on the liability side of the Fed's balance sheet has been reverse repurchase agreements (RRPs), which have plunged by $728 billion.
- How much longer is QT likely to continue, and how large could the Fed's balance sheet be when it ends? The answer largely boils down to the outlook for the U.S. economy, the stickiness of RRP balances and what the Fed considers an "ample" level of reserves. Below is our base case, predicated on our forecast for the U.S. economy falling into a modest recession in Q2-2024, as well as three non-recession, alternative scenarios.
    - **Macro Forecast Base Case:** A recession next year leads the Fed to cease QT at the start of Q3-2024. The Fed's balance sheet levels off around $7.2 trillion.
    - ***Non-Recession Alternative Scenarios***
        - **Sticky RRP Balances:** Overnight reverse repurchase agreements (ON RRP) remain near their current level of about $1 trillion, and as a result bank reserves drain relatively quickly in the coming months. The FOMC slows QT in Q3-2024 and stops it completely at the end of 2024; the Fed's balance sheet recedes to $7 trillion or so.
        - **RRP Back to Pre-Pandemic Level:** ON RRP balances shrink back to essentially zero and bank reserves drain more slowly. The FOMC slows QT in Q3-2025 and stops it completely at the end of 2025; the balance sheet declines to about $6 trillion.
        - **RRP Middle-of-the-Road:** ON RRP balances decline to about $500 billion, roughly the halfway point between their current level and zero. The FOMC slows QT to start 2025 and stops it completely at the end of Q2-2025; the balance sheet falls to approximately $6.5 trillion.
- We see the level of bank reserves as the key driving force in determining the "equilibrium" size of the balance sheet. In light of the 2017-19 QT episode, we assume that reserves of around 8% of GDP is when the balance sheet reaches "equilibrium."
- The research literature suggests that the runoff associated with our "middle-of-the-road" scenario is roughly equivalent to a sustained 50 bps increase in the fed funds rate. All else equal, this implies a 50 bps-higher 10-year Treasury yield and adds to a variety of other factors also putting upward pressure on longer-term yields.

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How Much Longer Will QT Remain in Place?

The marked rise in inflation that commenced in 2021 has led the Federal Open Market Committee (FOMC) to tighten U.S. monetary policy considerably since early 2022. Not only has the FOMC raised its target range for the federal funds rate by 525 bps since March 2022, but it also has allowed the central bank's balance sheet to shrink since June of last year, a process commonly known as "quantitative tightening" (QT). As we have highlighted in our U.S. Economic Outlook, we believe the Committee has finished its rate-hiking cycle. Although the FOMC may not raise its target range for the federal funds rate again, we expect the Committee will allow the Fed's balance sheet to shrink further in coming months. If so, then the overall stance of monetary policy will become more restrictive as QT continues.

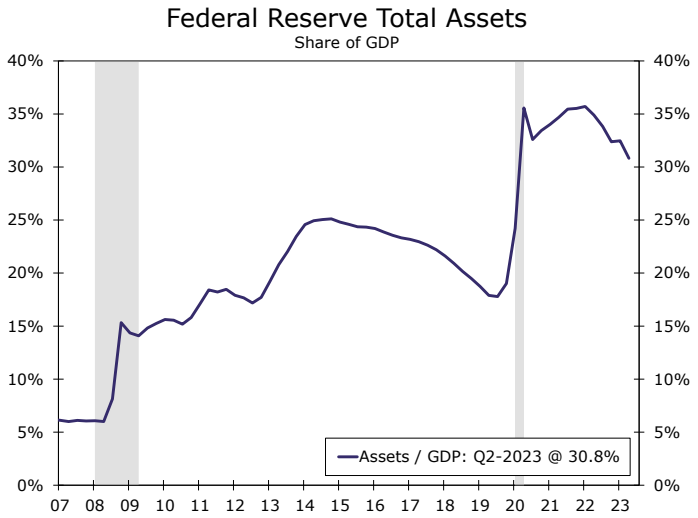
How much longer will the FOMC keep QT in place, and what are the implications for the ultimate size of the Fed's balance sheet? We attempt to answer those questions in this report. For readers who are unfamiliar with the nuts and bolts of the Fed's balance sheet, or for readers who would like a refresher, we would suggest referring back to this report we published last year on the mechanics of the central bank's balance sheet.

The Fed's Balance Sheet Has Shrunk by Roughly $1 Trillion Thus Far

The Fed's balance sheet has shrunk by roughly $1 trillion since April 2022.

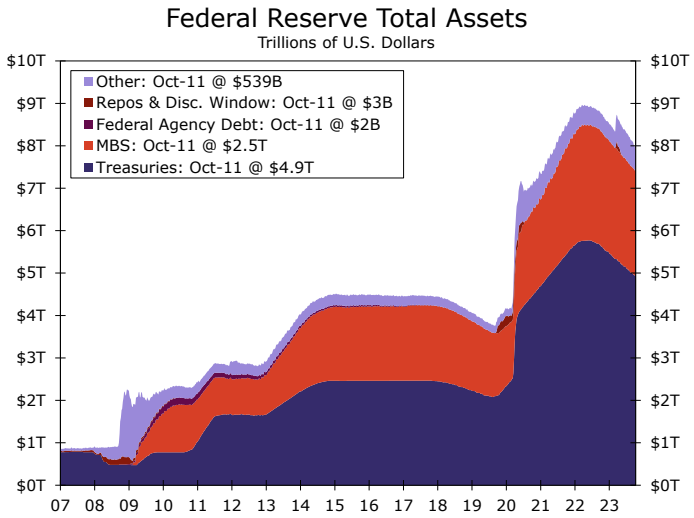
Before we discuss the outlook for the central bank's balance sheet going forward, we first highlight what has transpired over the past 16 months since balance sheet runoff began. The Fed's balance sheet has receded from a high of nearly $9 trillion in April 2022 to just under $8 trillion at present, although not in a straight line (Figure 1). As we will discuss in more detail below, the balance sheet shot up by nearly $400 billion in mid-March 2023 when tensions roiled the nation's banking system due to the failure of some regional commercial banks. Tensions in the banking system were short-lived due, at least in part, to actions that the Federal Reserve took at that time. The size of the Fed's balance sheet began to decline again in late March, and it has subsequently remained on a downward trend.

Figure 1



Source: U.S. Department of Commerce, Federal Reserve Board and Wells Fargo Economics

Figure 2



Source: Federal Reserve Board and Wells Fargo Economics

Because U.S. Treasury securities and mortgage-backed securities (MBS) account for the vast majority of the Fed's assets, any meaningful reduction on the left side of the central bank's balance sheet will need to occur via lower holdings of these securities (Figure 2). The FOMC announced in May 2022 that it would allow up to $30 billion worth of U.S. Treasury securities and up to $17.5 billion worth of MBS to roll off the Fed's balance sheet per month starting in June 2022. The FOMC subsequently increased the size of these monthly caps to $60 billion and $35 billion, respectively, beginning in September 2022. In total, $841 billion worth of Treasury securities have rolled off the central bank's balance sheet since QT began, while MBS holdings have declined by $228 billion over the same period. The total assets of the Federal Reserve have declined by less than this combined amount because the central bank acted to fulfill its lender-of-last resort responsibilities in the spring of this year. Specifically, the

Fed provided loans to some commercial banks when they experienced liquidity difficulties in the wake of the aforementioned regional bank failures. Some of these loans have subsequently matured or been repaid, but the amount of outstanding loans on the central bank's balance sheet still totals roughly $170 billion.

Understanding the Liability Side of the Fed's Balance Sheet

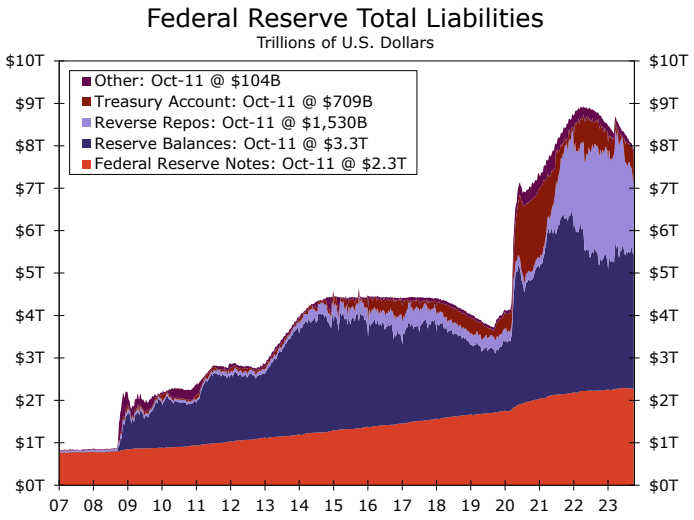
A clear understanding of the Fed's liabilities is crucial when thinking about the evolution of the balance sheet in coming months.

Of course, a reduction on the left side of an institution's balance sheet (i.e., its assets) must be matched by an equivalent decline on the right side (i.e., its liabilities and net worth). A clear understanding of the Fed's liabilities is crucial when thinking about the evolution of the balance sheet's size in coming months and years. The central bank's four largest liabilities at present are Federal Reserve notes (i.e., paper currency in circulation), the deposits that commercial banks hold at the Federal Reserve (i.e., bank reserves), reverse repurchase agreements (i.e., cash parked overnight at the central bank by a variety of financial institutions, most commonly money market funds) and the general account of the U.S. Treasury Department (i.e., the federal government's "checking account" at the central bank).

Federal Reserve notes were historically the largest item on the liability side of the central bank's balance sheet. As shown in Figure 3, currency in circulation tends to grow at a steady pace over the years as the U.S. economy expands. There is nearly $2.3 trillion worth of Federal Reserve notes outstanding today, and this amount likely will continue to grind higher in coming years in line with, or perhaps a bit faster than, nominal GDP growth.

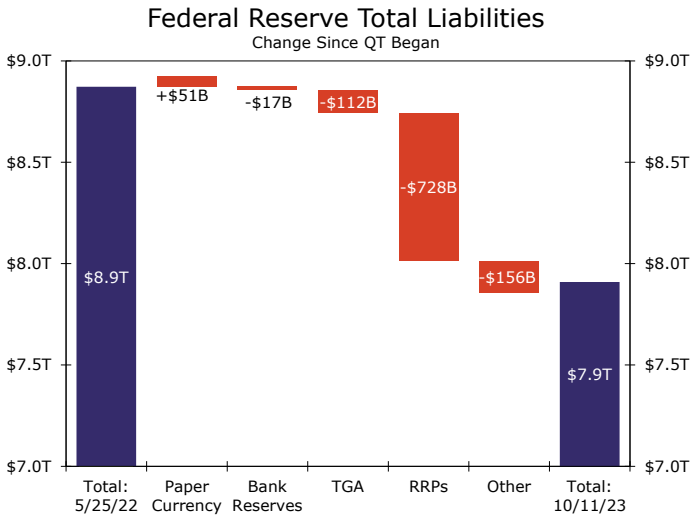
The general account of the U.S. Treasury Department (TGA) has also bounced around over the past few years. The TGA was about $820 billion in May 2022 right before the onset of QT. Since then, it has moved down to about $700 billion today. The TGA will swing around on a week-to-week basis as the government's financing needs ebb and flow, but our sense is that $650-$700 billion is about what Treasury is targeting over the medium term. As a result, we do not anticipate this being a big swing factor on the Fed's balance sheet in the quarters to come.

Figure 3



Source: Federal Reserve Board and Wells Fargo Economics

Figure 4



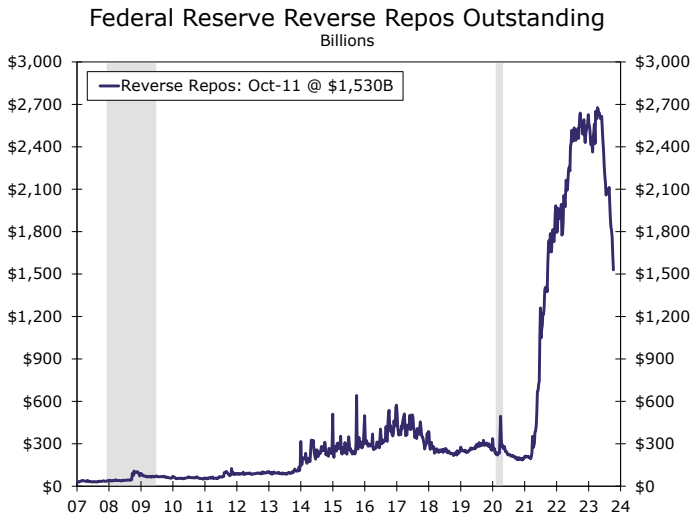
Source: Federal Reserve Board and Wells Fargo Economics

Consequently, any additional shrinkage on the liability side of the balance sheet will occur largely via commercial bank reserves and reverse repurchase agreements. Figure 3 makes it clear that bank reserves at the Federal Reserve were miniscule prior to the financial crisis. But as we explained in a report we wrote last year, bank reserves exploded during the financial crisis when the central bank implemented quantitative easing (QE) to provide more monetary support to the rapidly contracting economy. The Fed bought Treasury securities and MBS from banks and financed these purchases by crediting the deposit accounts of those banks. The security purchases increased the size of the Fed's assets while the equivalent rise in bank reserves increased the size of the central bank's liabilities. As the Fed's holdings of Treasury securities and MBS have subsequently declined, so have the reserves of the commercial banking system at the central bank, although perhaps by less than one might think. Bank reserves have declined by just $17 billion since QT began in June 2022 (Figure 4).

Any additional shrinkage on the liability side of the balance sheet will occur largely via commercial bank reserves and reverse repurchase agreements.

Before the pandemic, the value of reverse repurchase agreements (RRPs) on the central bank's balance sheet were a relatively small $250 billion or so. However, starting in 2021, RRP balances began to climb rapidly, mushrooming to $2.2 trillion by May 2022 and hitting an all-time high of nearly $2.7 trillion in April 2023. An in-depth discussion of the factors that drove this increase are beyond the purview of this report. In short, robust inflows into money market mutual funds, declining T-bill supply, the rapid pace of fed funds rate hikes and regulatory considerations drove RRP balances higher.[1] However, an explosion of T-bill supply in recent months and a much slower pace of rate hikes has helped push RRP balances down to $1.5 trillion (Figure 5). To recap, the value of Federal Reserve notes outstanding has risen since May 2022 while bank reserves, the Treasury's General Account and reverse repos have all declined on balance over the same period, with the latter category seeing the biggest decline since QT began 16 months ago.

Figure 5



Source: Federal Reserve Board and Wells Fargo Economics

When Will QT End?

Our base case is that QT will run through the end of Q2-2024.

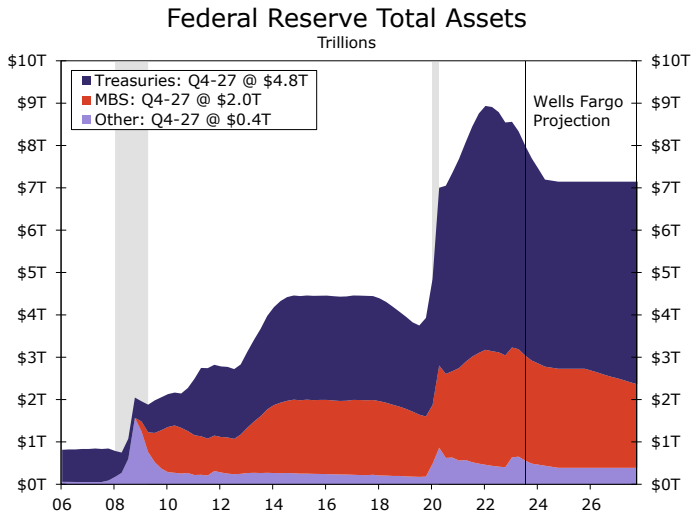
What is the outlook for the size of the Fed's balance sheet going forward? Our base case is that QT will run through the end of Q2-2024, at which point we expect balance sheet runoff to cease as the economy slips into recession and the FOMC pivots from rate *hikes* to rate *cuts*. In our view, the FOMC is unlikely to continue passive monetary policy tightening via QT during a period of negative GDP growth, rising unemployment and material cuts to the federal funds rate. Under this scenario, we would expect the Fed's balance sheet to level off around $7.2 trillion or so for the foreseeable future, with MBS runoff eventually resuming, perhaps in 2025 or 2026 (Figure 6). Holding the size of the balance sheet flat would allow the Fed to "grow into" its balance sheet as a share of GDP (Figure 7). Unless the economy nosedives into a deep recession, which we do not anticipate, the FOMC is not likely to restart QE purchases of securities.

But, what if there is no recession and the U.S. economy achieves a "soft landing"? Under this scenario, the FOMC likely would still cut the federal funds rate in an effort to slowly move monetary policy toward a more neutral setting. However, this pace of easing likely would occur much more gradually than in the recession scenario, and it strikes us as plausible that the FOMC would continue QT simultaneously. This in turn would allow the FOMC to attempt to return the balance sheet to roughly its "equilibrium" size. Chair Powell suggested this could be a possibility under the right circumstances during his press conference at the conclusion of the July 25-26 FOMC meeting.

In the long-run, the equilibrium size of the Fed's balance sheet is determined by demand for the Federal Reserve's liabilities, e.g. public demand for paper currency and demand for bank reserves held at the central bank. In its May 2022 statement on plans for reducing the size of its balance sheet, the FOMC stated that "over time, the Committee intends to maintain securities holdings in amounts needed to implement monetary policy efficiently and effectively in its ample reserves regime." This statement suggests that, like the 2017-2019 QT period, the level of reserves is the key driving force of

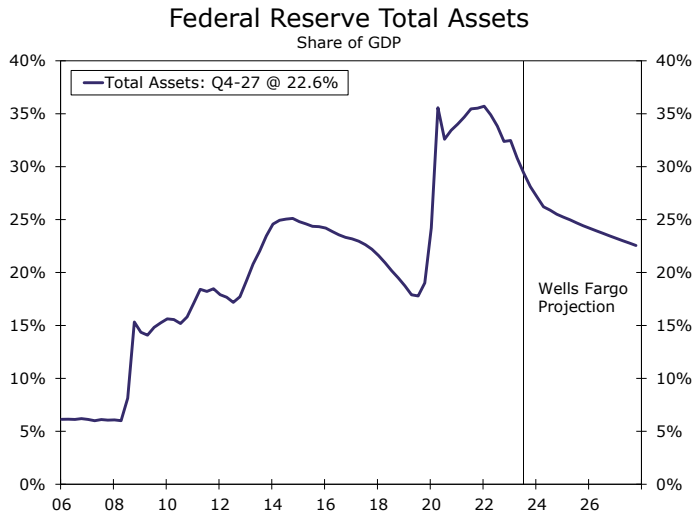
balance sheet projections. Put another way, the FOMC wants bank reserves to be plentiful, but not *too* plentiful.

Figure 6



Source: Federal Reserve Board and Wells Fargo Economics

Figure 7



Source: Federal Reserve Board, U.S. Department of Commerce and Wells Fargo Economics

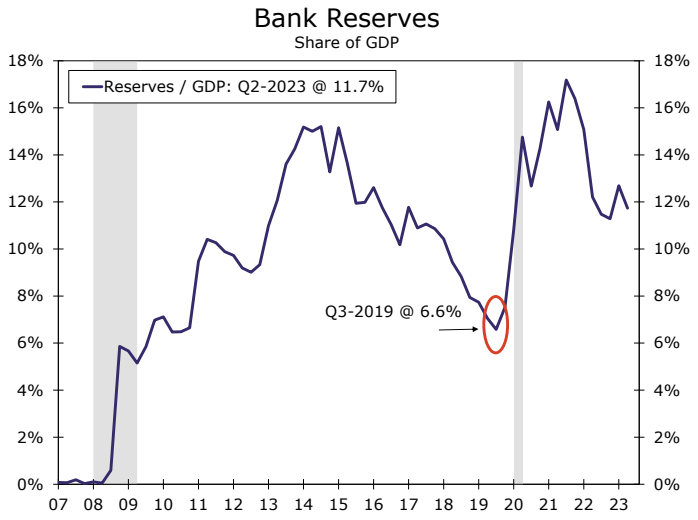
Projecting the Size of the Balance Sheet

The 2017-2019 QT episode is illustrative for thinking about when the Fed's balance sheet might reach its equilibrium size. In the 2010s, bank reserves peaked at roughly $2.8 trillion (~15% of GDP) in Q1-2015 (Figure 8). By Q3-2019, bank reserves had halved to $1.4 trillion (6.6% of GDP) amid declining security holdings and growth in non-reserve liabilities, such as currency in circulation. It was at this point in September 2019 that money market rates, such as the federal funds rate and the Secured Overnight Financing Rate (SOFR), spiked dramatically in a sign that reserves were no longer as "ample" as they appeared (Figure 9). The stress in money markets prompted a quick reaction by the Federal Reserve that included purchasing Treasury bills and lending via repurchase agreements.[2] By the end of 2019, money market rates largely had normalized, and reserves had risen to about $1.7 trillion (7.5% of GDP).

In light of that episode, we think a reasonable assumption is that at present, bank reserves are "ample" above $2.2 trillion (8% of GDP) and "scarce" below that threshold. Admittedly, there is significant uncertainty around this estimate. Bank demand for highly-liquid, safe assets could be higher or lower compared to 2019 for a variety of reasons. That said, we think this is a reasonable starting point for scenario analysis, and it is similar to the underlying assumptions used by the Federal Reserve Bank of New York and other analysts.[3] We also assume that the FOMC will first slow the pace of QT for a couple of quarters before stopping it altogether. This would be consistent with what occurred during the 2017-2019 QT period as well as the guidance given by the Committee in May 2022.

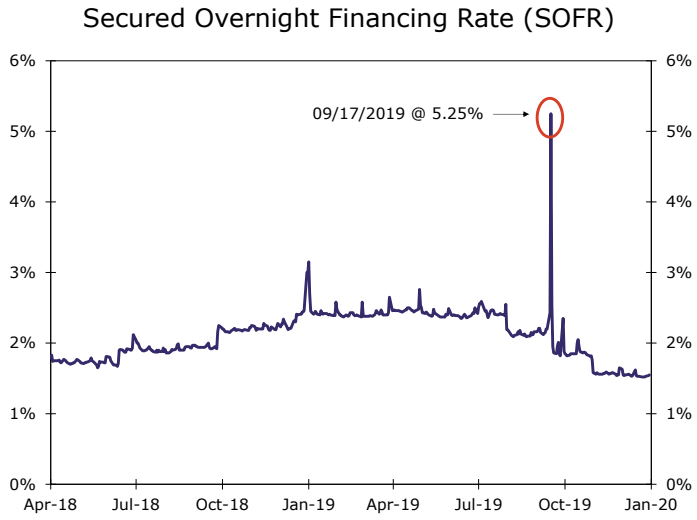
We assume that bank reserves are "ample" above 8% of GDP and "scarce" below that threshold.

Figure 8



Source: Federal Reserve Board, U.S. Department of Commerce and Wells Fargo Economics

Figure 9



Source: Bloomberg Finance L.P. and Wells Fargo Economics

With this piece of the foundation laid, we can begin to build up to an equilibrium balance sheet size by making some assumptions about expected growth in non-reserve liabilities. As discussed earlier, currency in circulation totals $2.3 trillion at present, and we expect it to grow at a fairly linear trend going forward. We assume that currency in circulation will grow roughly 8% per year, in line with the average from 2016-2019. The Treasury's General Account is around $650 billion, and we assume that it will remain more or less unchanged around this level for the foreseeable future.

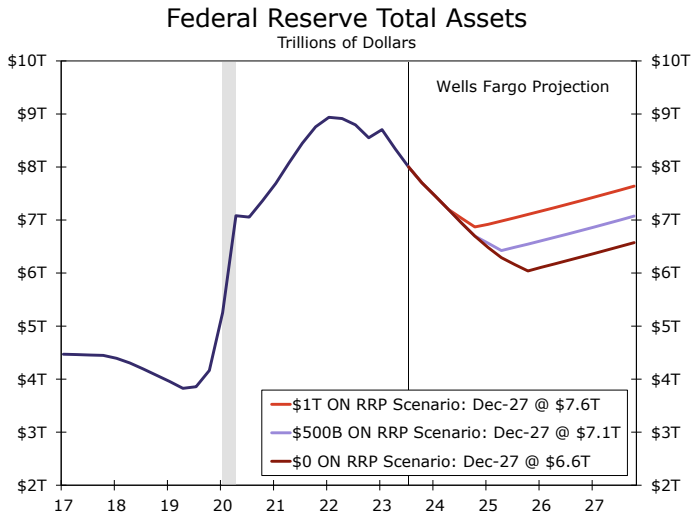
This leaves reverse repurchase agreements as the biggest remaining swing factor in the equation. At present, RRPs on the Fed's balance sheet total $1.5 trillion, with $290 billion held by foreign official institutions (e.g., foreign central banks), and the remaining $1.2 trillion of the RRP balance owned by money market funds and other miscellaneous financial institutions. Foreign official RRP balances, which are a part of the FIMA Repo Facility, stood at roughly $250 billion before the pandemic, so they have returned to approximately normal levels. But the remaining RRP balances, which are a part of the ON RRP Facility, were near zero in 2019. How sticky these funds are (or are not) will be critical to estimating the size of the Fed's balance sheet in coming years.

How sticky RRPs are (or are not) will be critical to estimating the size of the Fed's balance sheet in coming years.

We consider three scenarios to give us a range of estimates regarding the size of the Fed's balance sheet in coming quarters. In the first scenario, we assume that ON RRP balances are "sticky" and that they remain near their current level of $1.0 trillion. (We assume that the RRP balances of foreign official institutions remain constant at their current level of $300 billion or so in each of the three scenarios). With RRP balances remaining elevated, bank reserves would drain away from the system relatively quickly in coming months. Under this scenario, we project the FOMC would stop QT at year-end 2024. The balance sheet would recede to only $7 trillion or so (Figure 10).

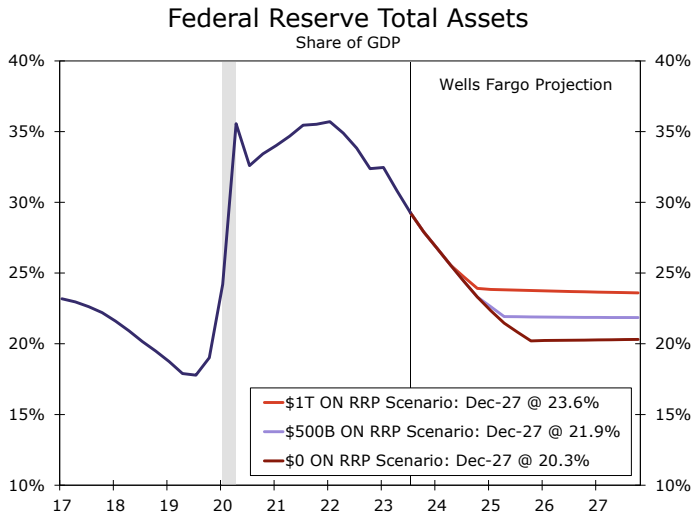
In the second scenario, we assume that ON RRP balances shrink all the way back to their pre-pandemic level of essentially zero. Under this second scenario, bank reserves drain away more slowly and don't become "scarce" until year-end 2025, which allows the central bank's balance sheet to shrink to roughly $6 trillion (Figure 10). Our third scenario assumes that ON RRP balances ultimately recede to the halfway point between their current level and zero (approximately $500 billion). Under this scenario, the balance sheet of the Federal Reserve shrinks to about $6.5 trillion through Q2-2025. Note that once the balance sheet reaches its equilibrium size in all three scenarios, it begins to grow modestly again to keep reserves as a share of GDP steady and to accommodate growth in non-reserve liabilities such as currency in circulation (Figure 11).

Figure 10



Source: Federal Reserve System and Wells Fargo Economics

Figure 11



Source: Federal Reserve Board, U.S. Department of Commerce and Wells Fargo Economics

What Are the Implications for Treasury Yields?

As we discussed earlier, the FOMC has undertaken QE to stimulate the economy at numerous points over the past 15 years. When the FOMC buys securities during QE, this additional source of demand puts upward pressure on the price of the bonds and downward pressure on their yields, all else equal. QT runoff is passive and does not involve active sales, but the idea is similar: as the central bank reduces its holdings of Treasury securities and MBS, the additional supply of these securities puts upward pressure on intermediate and longer-term yields, all else equal.

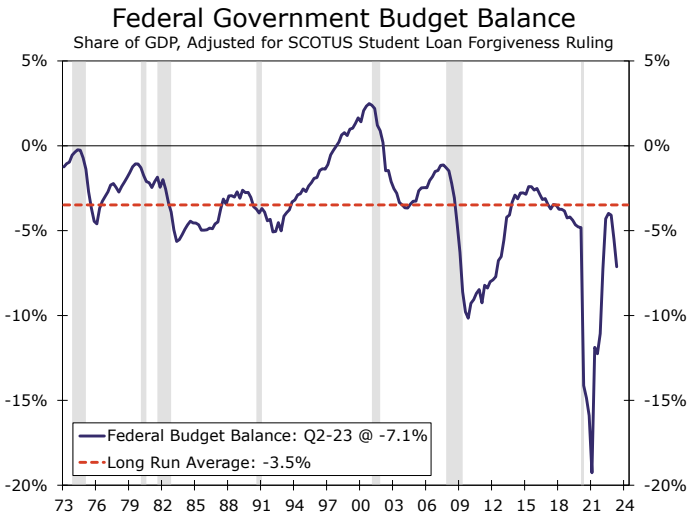
QT could cause the yield on the 10-year Treasury security to be roughly 50 bps higher than it otherwise would be.

Estimating the magnitude of QT's impact on yields is tricky. QT is a relatively new phenomenon, with the only other historical example the 2017-2019 period. This stands in contrast with the FOMC's primary monetary policy tool, the federal funds rate, which has been used as a policy lever for decades. In addition, there are many others tricky factors that must be controlled for in the analysis, such as the role QE/QT play in forward guidance for the federal funds rate.

That said, the research literature suggests that $2.5 trillion of runoff is roughly equivalent to a 50 bps increase in the federal funds rate on a sustained basis.[4] In 10-year equivalent terms, the magnitude is similar. In other words, if QT runs until mid-2025 and the Fed's balance sheet declines by about $2.5 trillion from peak to trough, then we would expect the 10-year Treasury yield to be roughly 50 bps higher than it otherwise would be, all else equal.

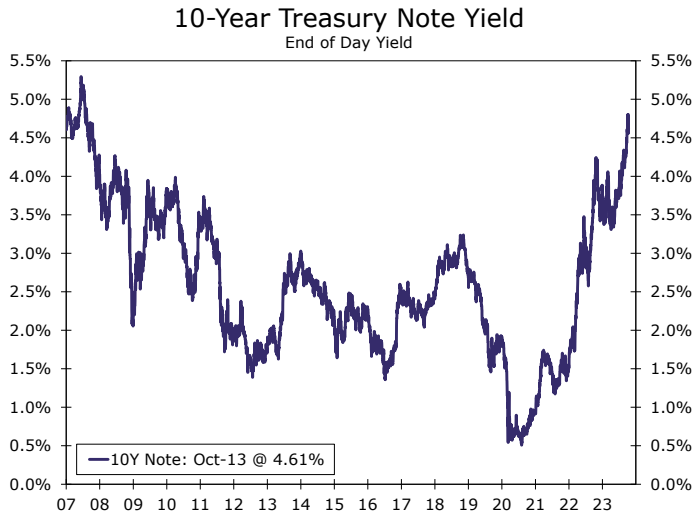
Estimates vary somewhat depending on the study and assumptions, and the actual impact could be a bit larger or smaller than 50 bps. That said, we think 50 bps is a reasonable base case. Although this effect is not huge, it is important to keep in mind that this period's QT is taking place as a variety of other factors are also putting upward pressure on longer-term yields. As we wrote in a recent report, the federal budget deficit has widened over the past year and is about two percentage points larger today than it was in 2019 (Figure 12). A deluge of Treasury supply from widening deficits and QT is occurring as markets consider the prospects of a "higher for longer" outlook for the federal funds rate and a possible shift higher in "r-star." Against this backdrop, it is perhaps not surprising that medium- to longer-term Treasury yields are as high as they are today (Figure 13).

Figure 12



Source: U.S. Department of the Treasury, U.S. Department of Commerce and Wells Fargo Economics

Figure 13



Source: Bloomberg Finance L.P. and Wells Fargo Economics

Endnotes

1 - See our July 2022 report, "The Fed's Balance Sheet: Your Questions Answered; Part I: The Nuts and Bolts of the Balance Sheet" for a more in-depth description of the Fed's reverse repo facility. (Return)

2 - See "Repo Running Wild: A Deeper Dive" (September 2019). (Return)

3 - Ennis, Huberto and Tre' McMillan. "Fed Balance Sheet Normalization and the Minimum Level of Ample Reserves." Federal Reserve Bank of Richmond. Economic Brief No. 23-07, February 2023. See also the Federal Reserve Bank of New York's Open Market Operations During 2022 report (April 2023). (Return)

4 - See Crawley, Edmund, Etienne Gagnon, James Hebden and James Trevino. "Substitutability between Balance Sheet Reductions and Policy Rate Hikes: Some Illustrations and a Discussion." FEDS Notes. Washington: Board of Governors of the Federal Reserve System, June 3, 2022; Chaitri Gulati and A. Lee Smith. "The Evolving Role of the Fed's Balance Sheet: Effects and Challenges." Economic Review, Fourth Quarter 2022. Federal Reserve Bank of Kansas City, November 2022; and Bin Wei. "How Many Rate Hikes Does Quantitative Tightening Equal?" Federal Reserve Bank of Atlanta's Policy Hub, No.11-2022, July 2022. (Return)

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