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Demystifying the Federal Reserve's Balance Sheet

Remarks by

Christopher J. Waller
Member

Board of Governors of the Federal Reserve System

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Thank you, Lorie. Let me start by expressing my deepest condolences to the families and loved ones of those harmed by the flooding in the Hill Country. I cannot imagine the pain and anguish they are feeling. My prayers go out to all those affected.

Turning to my remarks for today, thank you also for the opportunity to speak to you about the Fed's balance sheet, one of the more complex, and, I believe, misunderstood aspects of the Federal Reserve's role as a central bank.[1] To level set the conversation, let me start with some simple facts. In August of 2007 our balance sheet was around $870 billion, equal to approximately 6 percent of nominal gross domestic product (GDP). Today it is around $6.7 *trillion*, with a *t*, which is about 22 percent of GDP. This is down significantly from its maximum size of nearly $9 trillion in early 2022 but still quite large. Since nominal GDP has essentially doubled since 2007, if our balance sheet had grown at the same rate, it would be around $1.7 trillion today—not $6.7 trillion.

An obvious question is why our balance sheet is so much larger than economic growth would have predicted. As an aside, let me point out that there is no consensus among economists about how large a central bank balance sheet should be, but it is logical to ask: if monetary policy worked when the balance sheet was 6 percent of GDP, why is it, and perhaps needs to be, proportionally so much larger now?

A major reason is that the Federal Reserve embarked on two major balance sheet policy initiatives over the past twenty years to respond to urgent problems in the economy. First, we engaged in quantitative easing, or QE, to provide support to the economy after the advent of the Global Financial Crisis and then again with the COVID-

[1] The views expressed here are my own and are not necessarily those of my colleagues on the Board of Governors or the Federal Open Market Committee.

19 pandemic. Second, we consciously changed our implementation framework for providing liquidity to the banking system by moving from a scarce-reserves system to an ample-reserves system. This change was necessary because there were shortcomings with the scarce-reserves approach—short-term rates were harder to control and required daily interventions in the markets by the Fed, and these problems were made worse when rates were at or near zero. The Federal Open Market Committee (FOMC) explicitly stated its commitment to ample reserves in 2019, when we were gradually shrinking our balance sheet, concluding that this approach would be used over the longer-run, and it soon proved very useful when the pandemic again brought rates to zero.[2]

Although these are two fundamentally different reasons for changing the size of our balance sheet, we did them more or less at the same time. This has caused confusion, with some people thinking that the Fed is choosing to keep the balance sheet larger than it needs to be. This confusion is amplified by the fact that there are external forces that have boosted the size of our balance sheet that are not under the control of the Federal Reserve. My goal today in this speech is to disentangle each of these forces and try to demystify the role of our balance sheet in conducting monetary policy. I also want to clarify issues that are currently being discussed in the public domain. I agree that the balance sheet needs to shrink but, as I will show, not by as much as some believe it should. I will also explain why the composition of the balance sheet matters as much as its size and how changes are needed there as well.

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[2] In January 2019 the FOMC released the Statement Regarding Monetary Policy Implementation and Balance Sheet Normalization, which is available on the Board's website at https://www.federalreserve.gov/newsevents/pressreleases/monetary20190130c.htm

I know from teaching this topic over the years to my undergraduate students that unless you are an accountant or a banker, you would probably rather go to the dentist than listen to a speech about the Fed's balance sheet. I hope to explain it clearly enough that you can leave here and engage in the public debate with a better understanding of the issues. To do so, the approach I want to take is the following. Suppose the Fed had never used quantitative easing and simply decided to move to an ample-reserves system from a scarce-reserves system. How would the liability and asset sides of our balance sheet change in response to this one policy decision? After addressing this question, I will then discuss how QE affects our balance sheet and also some difficult tradeoffs that arise when engaging in QE.

The Big Three Liabilities

For any balance sheet, we start with the asset and liability entries. Assets are things that are owned, and liabilities are things that are owed to others at a given point in time. I will start by listing the big three liabilities on the Fed's balance sheet and the characteristics of those liabilities. There are other types of liabilities (and capital) that must be accounted for, but they are too small to matter for the policy matters I want to discuss, so I will ignore them. After discussing these "big three" liabilities, we can consider what assets should be held to match those liabilities.

The first big liability of the Federal Reserve is currency outstanding. The Fed supplies U.S. dollars elastically to the public, based on demand, distributing dollars through banks.[3] That demand, which is not controlled by the Fed, is basically determined

[3] The Federal Reserve supplies currency on demand to ensure that commercial bank money trades one for one with currency. This creates certainty that a customer's demand to transform one unit of commercial bank money into a unit of currency will be met.

by how fast the economy—and thus the need for cash—is growing. At the end of 2024, the amount of dollars in circulation was $2.3 trillion. That is up considerably from around $800 billion in 2007 after which the overall balance sheet began growing sharply. Even in terms of GDP, currency has increased, from 5.5 percent of GDP in 2007 to almost 8 percent today. So, an important point that many do not realize is that the Fed's balance sheet has expanded, especially in nominal terms, from increased demand for U.S. currency.[4]

What are the characteristics of currency as a liability? First, it is non-interest bearing. Second, it never "matures" as other debt obligations do. Let's just say that currency is different from other liabilities—it pays no interest, and you never get back your initial payment for acquiring it. If you come to the Fed and ask us to redeem a dollar bill, we will simply give you another dollar bill.

The second big liability is the Treasury General Account, or TGA. The Federal Reserve is the fiscal agent of the U.S. Treasury, which means that we are the bank for the U.S. government and the TGA is the Treasury's checking account. What are the characteristics of the TGA? First, it is a short-term liability that moves up and down as cash flows in and out of the account as the Treasury receives tax and other payments and pays its bills. Second, we do not pay interest to the Treasury on its account balances. Finally, given the asynchronous timing of payments and receipts, the TGA can vary significantly, especially when the debt ceiling is binding. During 2024, it generally

[4] Judson (2024) estimates that a significant share of demand for U.S. currency comes from abroad, especially in the $100 denomination; see Ruth Judson (2024), "Demand for U.S Banknotes at Home and Abroad: A Post-Covid Update," International Finance Discussion Papers 1387 (Washington: Board of Governors of the Federal Reserve System, March), https://doi.org/10.17016/IFDP.2024.1387.

fluctuated between about $650 billion and $950 billion, briefly peaking at around $960 billion during the April tax season. Due to this year's debt ceiling constraint, the TGA fell from its 2024 average of $780 billion to about $325 billion recently, and with the debt ceiling just increased, there will be a quick rebuild in the coming weeks. So, it is not unusual for the TGA to fluctuate by several hundred billion dollars. This situation is very different than the one in 2007 when the TGA was deliberately held steady at $5 billion each day. This change reflects both how much federal spending has grown in that time and also a shift in accounting in 2015 to holding an estimated week's worth of federal payments in the TGA—a decision made by the Treasury to better manage its cash flow.

An important point that applies to both currency and the TGA is that the Federal Reserve does not have control over the size of these liabilities and hasn't been responsible for their sharp increases. Together, they represent about $3 trillion of our $6.7 trillion balance sheet, or roughly 10 percent of nominal gross domestic product. So, the size of the Fed's balance sheet, which is now about 22 percent of nominal GDP, is nearly half accounted for by these two liabilities that are not under the Fed's control. Those who argue that the Fed could go back to 2007, when its total balance sheet was 6 percent of GDP, fail to recognize that these two factors make it impossible.

The third big liability on the Fed's balance sheet is reserves, which are the funds that depository institutions hold in accounts at the Fed. In effect, these are the checking account balances of the banking system that are held at the Federal Reserve. What is the characteristic of reserves held by banks? First, much like the TGA, they are short term in nature and very liquid—in effect like digital cash. They are the safest and most liquid asset in the financial system and used to conduct payments between banks. The reserve

balances that an individual bank holds can increase or decrease, depending on the flow of payments between banks. Much like the TGA, an individual bank's reserve holdings can be volatile. But these payments do not change the total amount of reserves in the banking system—they simply transfer them from one bank to another. So, while reserve balances of individual banks can move around, total reserves are more stable, and the total amount of reserves in the system is directly controlled by the Federal Reserve. Second, in October 2008, Congress authorized the Federal Reserve to pay interest on these liabilities. Besides ending the implicit tax on banks for holding reserves, it was a step aimed at helping the Fed conduct monetary policy effectively, which it does, but it is sometimes inaccurately criticized as a giveaway to banks. I will address this point a little later. But I mention it here because the amount of reserves in the system affects the total payment flow the Fed must make to banks at the current interest rate on reserves.

Assets Backing These Liabilities

By the definition of a balance sheet, these liabilities must be matched by assets held by the Federal Reserve. Let's consider matching assets to our currency liability. As I said earlier, currency pays no interest and never matures. So, we can hold assets of any maturity length to offset our liability for currency. Since currency pays no interest, any interest earned off these assets is pure profit. Given that longer-maturity assets generally pay higher interest rates and are less volatile, it seems reasonable to hold longer maturity assets against our currency liability.

Now consider the TGA liability. We also pay no interest on the TGA. But, unlike currency, a problem with the TGA is that it can vary substantially, which makes total reserves in the system more volatile. This link to reserves is because when tax payments

are made to the Treasury, we debit the payer's bank reserves and credit the Treasury's TGA account. When the Treasury makes a payment, we debit the TGA and credit the recipient bank's reserve account. Thus, volatile movements in the TGA affect the Fed's reserve management policy. There are two ways to deal with this situation: hold a buffer of reserves to ensure movements in the TGA do not affect market liquidity or hold short-maturity assets that we can expand or contract to sterilize movements in the TGA such that total reserves in the banking system are unchanged.[5] The first strategy suggests the buffer stock of assets could take the form of somewhat longer maturity, while the second strategy could require holding short-term assets that can easily be bought and sold with little interest rate risk.

That brings us to reserves. As I mentioned, reserves are a short-maturity liability which pay interest, which suggests that the Fed should consider holding short maturity assets against this liability. Treasury bills and short-maturity Treasury notes are the safest and most liquid assets, so it would make sense to hold them against reserves. If the interest rate earned on our short maturity Treasury assets is very close to the interest we pay on reserves, then our interest earnings from the Treasury are simply passed through to the banks. In this sense, our balance sheet is just another way to transfer interest payments on Treasury securities from the Treasury to the banks.[6]

Because of the minimal spread between these two short-term interest rates, banks are largely indifferent to either holding reserves or the short-term Treasury securities we

[5] For a discussion of the short-maturity assets approach, please see Annette Vissing-Jorgenson (forthcoming), "Fluctuations in the Treasury General Account and the Fed's Balance Sheet," FEDS Notes (Washington: Board of Governors of the Federal Reserve System).
[6] For accounting purposes, our net interest income on these assets backing reserve balances would be near zero.

hold—both are highly liquid and pay roughly the same rate of return. But layer on top of this the fact that reserves are a bit more liquid than Treasury securities because banks don't have to buy or sell the Treasury securities to get reserves, and banks are willing to hold a lot of reserves. Since the Fed supplies these reserves, one might ask what it costs taxpayers to supply a large amount of reserves. From the Treasury's point of view, its interest expense is the same regardless of who holds the short-term Treasury securities. So, the Fed can provide all the liquidity that banks need at zero marginal cost, which makes me wonder why some want to make reserves scarce. I often use the following analogy to drive this point home: If governments could provide clean, safe drinking water for citizens at zero cost, why would they make it scarce?

Now, one could ask why pay interest on reserves at all? Why not keep the interest income generated on the assets we hold to back reserves and remit it back to the Treasury? This seems like a no brainer! But there are a few reasons that interest on reserves makes sense, including the following.

First, paying interest on reserves that is commensurate to the rate paid on short-term Treasury securities makes reserves attractive to banks, and holding reserves improves the functioning of the financial system by giving banks more liquidity and greater scope to settle payments in an orderly way. In contrast, if reserves bear no interest, then commercial banks will have strong incentives to avoid holding a lot of reserves, and instead hold short-term, interest-bearing assets like Treasury bills. If banks managed their liquidity only by buying and selling Treasury securities, several banks selling Treasury securities at the same time could flood the market and put undesirable upward pressure on interest rates across the economy. An ample-reserves regime where

we pay interest on reserves ensures that there are enough reserves in the banking system to avoid this kind of sell off in Treasury securities, helping to stabilize the financial system without any harm to banks or their customers.

The second part of the case for interest on reserves is that it isn't costing taxpayers any money. As I noted earlier, whether the Fed or banks hold the Treasury securities, the Treasury is paying interest on its debt. And, if the Fed is holding the Treasury securities, then the interest payment from the Treasury to the Fed on the Treasury bills is matched with an interest payment from the Fed to banks on their reserves. So, paying interest on reserves is not creating any additional expense to the Treasury.

But what is the appropriate level of ample reserves the Fed is trying to get to? There is no clear answer to this question and that is what we are trying to discern. We want to provide the amount of liquidity necessary, but we don't want to provide excessive liquidity that banks do not want or need.

One reason for increased demand for reserves is that since the Global Financial Crisis changes in banking regulations led to a large shift in demand for high-quality liquid assets. For example, bank liquidity regulations, such as the liquidity coverage ratio, encouraged banks to hold high quality liquid assets. As these regulations came into play, banks' demand for high-quality liquid assets, including reserves, increased tremendously relative to 2007.

I think of ample reserves as the threshold below which banks would need to scramble to find safe, liquid funding, something that would drive up the federal funds rate and money market interest rates across the economy. We have some experience with testing the level of ample reserves during an episode of stress in the financial system that

occurred in 2019. At the start of that year, reserves stood at about 8 percent of nominal GDP, and we were continuing to reduce our balance sheet with no apparent stress among banks or otherwise in the financial system. In September 2019, reserves fell below 7 percent of nominal GDP, and stresses appeared in the financial system, requiring the Fed to step in and take action to add reserves. So, I start from the view that problems emerged when reserves fell below 8 percent of GDP. One might argue that banks are now larger relative to GDP, so they may desire a bit more reserves. Furthermore, there is also a genuine concern that it is not only the total amount of reserves that matters but also the distribution of reserves across the banking system. So, I would add a buffer to the 8 percent of GDP that I cited earlier and assume 9 percent is the threshold below which reserves would not be ample. That would mean, as of today, that $2.7 trillion of reserves is roughly ample—it could be more or less in practice, but let me use it as a benchmark.

So, putting the pieces of this hypothetical minimum balance sheet together, we have an estimated $2.7 trillion in reserve balances, $2.3 trillion in currency, and an average of $780 billion in TGA liabilities. This combined means the Fed should be operating with a balance sheet that is roughly $5.8 trillion dollars or 19 percent of GDP. Close to half of this proportional increase from 2007, as I noted, comes from currency and TGA growth outside the Fed's control, and the rest from a transition to an ample reserves regime that has been a necessary, efficient and more effective way of managing monetary policy.

In summary, if we had simply adopted an ample reserves system and backed these liabilities as I suggested without engaging in quantitative easing, there are three key takeaways: (1) we would be earning a net profit off of the assets backing currency and the

TGA, (2) the assets backing ample reserves would simply be a way to transfer interest payments to the banks, and (3) we would hold short to medium term assets that could be bought or sold to neutralize large movements in the TGA to keep total reserves stable. With this balance sheet, the Federal Reserve would never run losses, the banks would have ample liquidity for market functioning, and the Fed would not face serious interest rate risk on its asset holdings.

Today's Balance Sheet and Where We Are Heading

At this point there are going to be people somewhere shaking their fists and yelling that what I have said is simply false because the Federal Reserve is currently losing money on its balance sheet. Our interest expense on reserves is now exceeding our interest income on our asset holdings. This is all true. But this outcome is because of engaging in QE for many years since 2007, not because we are running an ample reserves system. Remember, what I have described so far is what an optimally designed balance sheet would look like if we had never engaged in QE and simply moved to an ample-reserves system.

Let me now do the following. Assume we have a balance sheet that corresponds to an ample-reserves system, but now the Fed engages in QE as a means of conducting monetary policy to support the economy.

The Federal Reserve engaged in QE programs when the policy rate was driven down to zero because of severe shocks to the economy after the Global Financial Crisis and then because of the COVID-19 pandemic. Once the policy rate is at zero, the Federal Reserve is constrained in its ability to use its traditional tools to provide further support for the economy. The idea of QE is to buy longer-duration securities as opposed to short-

duration assets. By increasing the demand for long-dated securities, the Fed drives up the price and drives down the yield on those securities. By lowering longer-term yields the Fed is able to loosen financing conditions to stimulate aggregate demand. The Fed typically buys longer-dated Treasury securities during QE, but it also bought agency mortgage-backed securities that have the implicit backing of the U.S. Treasury and are issued by Fannie Mae and Freddie Mac, the two government-sponsored enterprises.

QE affects our balance sheet in material ways that differ from what happens if one is simply constructing the balance sheet to support ample reserves, currency, and the TGA. First, it increases the duration of our balance sheet beyond what we would hold just for currency. Longer-duration assets are more prone to interest rate risk, and the lower the interest rates on those assets, the lower interest income the Fed will receive far into the future. If interest rates rise suddenly or over time as the economy recovers, those assets lose value (in substantial amounts), which lowers the unrealized value of our portfolio. Second, we use short-term reserves to buy the longer duration assets which leads to a maturity mismatch between our assets and our liabilities. So, the additional reserves that are injected from QE may not be costless when short-term rates rise, as they did in 2022, meaning that interest paid on those additional reserves will exceed what is earned on the long-term assets that were purchased with them.

This effect highlights the fact that engaging in QE involves a tradeoff for the Federal Reserve—trying to support the economy in serious economic downturns at the zero lower bound while creating a maturity mismatch between our assets and liabilities that brings interest rate risk onto our balance sheet. This tradeoff does not happen if we simply structure our balance sheet to support an ample-reserves system. The decision to

engage in QE requires the Federal Reserve to weigh the benefits and costs from this action. Those benefits and costs are often difficult to quantify at the time QE is undertaken. It is only with hindsight that we can fully assess them, which is one of the challenges of making policy in real time.

Where do we stand today? The Federal Reserve is operating with an abundant, or more than ample, level of reserves, and our securities holdings are tilted toward longer-dated maturities. We are shrinking the balance sheet to get back to a size consistent with an ample reserves system. As of last month, banks had nearly $3.4 trillion of reserves with the Fed, accounting for about 11 percent of nominal GDP.[7] Given my rough estimate of the level of reserves needed to be ample, I believe we can likely continue to let a share of maturing and prepaying securities roll off our balance sheet for some time, reducing reserve balances. Of course, we will continue to carefully monitor financial markets as we go.

For me, the bigger problem with our balance sheet is that the maturity structure of our assets to support an ample-reserves system is not well matched. We have far too many long-term assets on our balance sheet relative to my arguments for how to structure the balance sheet. I argued that long-term assets should only be held against currency liabilities, which are $2.3 trillion. But we hold about $2.3 trillion in agency mortgage-backed securities alone! So the duration of our asset portfolio is far too long for the liabilities we need to hold for an ample-reserves system.

If the Fed moved forward with a maturity-matching strategy as I suggest, it would hold about half of its Treasury securities in shorter-dated bills. There have been some

[7] As I noted, there will be a replenishing of the TGA in coming weeks. This action will reduce reserves commensurately.

advocates who support moving toward the Federal Reserve having a Treasury securities portfolio whose composition mimics the breakdown, or "universe," of total Treasury securities outstanding. This would mean having about 20 percent of our current balance sheet in bills. The argument for this maturity structure is that with this approach, the Fed's holdings would not be putting pressure on any one segment of the yield curve. This is a valid argument, but it would put more duration on our balance sheet and expose the Fed to potential income losses, as we have witnessed the past few years. Maybe that is a tradeoff we should make to avoid distorting our demand for Treasury securities relative to the market's demand. In the end, I support continuing the conversation about what the ultimate composition should be. My objective today was to try to clarify what an ample-reserves balance sheet should look like as a starting point for this conversation.

In the years ahead, moving our portfolio toward shorter-duration securities will be a slow process unless we were to take the dramatic step of selling existing securities to replace them with Treasury bills. When reserves hit their desired ample level and we need to increase securities holdings in line with growth in autonomous factors, like currency and the TGA, we can actively accumulate bills, if we do not take other actions sooner.

I hope that taking a deep dive into a few line items on the Fed's balance sheet has helped to see some issues that lie ahead. Though the FOMC has not finalized its desired efficient and effective size and composition of the balance sheet, it seems apparent that today's portfolio should be adjusted. And there are obvious steps to take. We are reducing the size of the balance sheet slowly and need to consider shifting it toward more

bills. As we do so, we should do it gradually and predictably, so the markets and public are fully aware of our actions.[i]

[i] On July 10, 2025, a typo was corrected in this sentence to change "reserves" to "Treasury securities": "And, if the Fed is holding the Treasury securities, then the interest payment from the Treasury to the Fed on the Treasury bills is matched with an interest payment from the Fed to banks on their reserves."