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A Closer Look

The Fed's balance sheet: how much further to go?

In a nutshell

- Many of the fears about the runoff of the Fed's balance sheet have been overdone.
- The runoff will continue, but end before reserves get scarce so the Fed can preserve the current, abundant-reserves operating procedures for controlling short-term interest rates.
- That suggests the cumulative runoff may reach 800 billion USD to 1 trillion USD, and end between late 2019 and mid-2020.
- That would leave the Fed's balance sheet much larger than implied by pre-crisis trends.

The runoff of the Federal Reserve's (Fed's) balance sheet has gotten a lot of attention lately. Indeed, it shouldered much of the blame in some minds for the sharp selloff in risk assets late last year, spurring calls for the Fed to halt the process to avoid further damage. Some argued that by not scaling back long ago the Fed stoked excessive risk taking that may now be reversing and destabilizing markets.[1] Still others contend that the Fed's purchases never accomplished much in the first place because the "liquidity" they were supposed to unleash wound up "frozen" as excess reserves in the banking system; even now, after several years of decline, excess reserves remain elevated, which these critics say is because these balances earn interest, wasting their lending potential.[2]

Clearly, not all these nostrums can be right. In fact, we think they mostly miss the mark, misjudging the effects of the Fed's balance sheet or mischaracterizing its channels of influence. And recent fears about the runoff seem overdone. The process has been slow-moving, well-telegraphed, and largely de-linked from changes in the federal funds rate – hard to see how it could have sparked the sudden, precipitous sell-off in risk assets late last year or the partial recovery more recently.

So the runoff will likely continue a while barring an outsized deterioration in the economic outlook and end when technical considerations dictate – in particular, when reserves (bank's deposits at the Fed) are lower than today but still abundant enough to enable Fed policymakers to control short-term interest rates by adjusting administered rates like the interest paid on reserves, rather than reserve levels themselves (as was required prior to the crisis, when reserves were scarce). There is some uncertainty about just what that optimal level of reserves might be, and when it will be reached; we had originally anticipated sometime near mid-2020, when the cumulative runoff of the Fed's security holdings would be approaching 1 trillion U.S. dollars (USD), but recent developments suggest the threshold for reserve scarcity might be a bit higher, implying a slightly smaller cumulative runoff (maybe only 800 billion USD or so), winding down as early as the end of this year or somewhere in between.

Either way, the end is not that far off as about 40% to 50% of the quantity of runoff is likely behind us. And the range of uncertainty is pretty small – perhaps just 200 billion USD or so, which should make minimal difference for financial conditions. And when the process is done, the Fed's balance sheet will be much larger than implied by pre-crisis trends because policymakers will not be going back to the kind of "scarce reserves" operating procedure that prevailed back then. To see why, it helps to review how the Fed got here in the first place.

[1] https://www.wsj.com/articles/quantitative-tightening-not-now-11544991760
[2] https://www.wsj.com/articles/the-feds-obama-era-hangover-11546374393
All articles are available on https://go.dws.com/cio-view-articles

The pre-crisis world

Prior to the financial crisis, the Fed's balance sheet was much smaller, and policymakers exercised control of short-term interest rates differently. The Fed's primary asset was U.S. Treasuries (just under 800 billion USD held outright), plus small holdings of a few miscellaneous items. The biggest liability by far was currency, followed by a small amount of the Treasury's deposits at the Fed used to make government payments, reverse repurchase agreements (repo)[3], and reserve balances – the deposits that banks hold at the Fed.

Banks can trade these reserve balances among themselves in the federal funds market. But they cannot alter the overall level of reserves in the system. The Fed can, though. And that is how policymakers controlled short-term interest rates before the financial crisis. By purchasing (selling) Treasuries, and crediting (debiting) the reserve account of the bank on the other side of the transaction, the Fed can adjust reserve levels, and prior to the crisis did so to achieve a desired target for the federal funds rate and thereby influenced other short-term rates and indirectly, broader financial conditions. Of course, doing so required estimating how many reserves banks wanted to hold. But that was pretty simple pre-crisis because reserves then were not interest bearing, so banks sought to hold little more than they absolutely needed to meet their known, statutory reserve requirements, which are set at a fixed percentage of their customers' transactions deposits above certain limits. Back then, banks in aggregate typically aimed for only about one to two billion USD of reserves in excess of their six to eight billion USD of required balances, and their demand for these excess balances did not fluctuate much. So if the Fed provided just a little more, the federal funds rate would fall. A little less, and it would rise.

But controlling the federal funds rate in this "scarce reserves" environment required frequent tweaks to the Fed's asset holdings, to offset transitory movements in factors affecting reserves. If the public wanted to hold more currency temporarily over the holidays, for example, banks would request it from the Fed, and their reserve accounts would be debited accordingly, but since reserves were scarce to being with the Fed would have to buy Treasuries (often temporarily, on repo) to offset the reserve drain and prevent the federal funds rate from rising. Temporary swings in the Treasury's deposits at the Fed (coming from their accounts at banks) would cause similar fluctuations in reserves that the Fed would also have to offset. Keeping the funds rate near target in a world where reserves were scarce required almost daily, temporary fine-tuning of the Fed's holdings of Treasuries. Permanent purchases were rarer, driven largely by trend increases in the public's currency needs.

Entering the crisis

Much of this changed with the financial crisis and its aftermath. As policymakers ran out of room to lower the federal funds rate, yet still judged that the economy needed support, they opted for

[3] In this case it refers to Treasuries that the Fed would temporarily lend to dealers. With a repurchase agreement, a dealer sells securities, or collateral, to a counterparty with the agreement to buy back the securities at a higher price at a later date. If the dealer lends money it is known as a reverse repo (RRP).

"unconventional" easing: a combination of "forward guidance," to signal that short-term rates would remain low for a long time (thereby helping to hold down longer-term rates via the expectations channel); and purchases of long-term Treasuries and mortgage-backed securities (MBS), to reinforce those signaling effects and to lower the term premium[4] by reducing the supply of securities with duration risk, thus raising their prices (lowering their yields). The purpose of these unconventional measures was to ease financial conditions and bolster economic activity – in essence, to replicate the stimulatory effects of conventional cuts in the federal funds rate, when such cuts were no longer feasible.

Multiple studies suggest the Fed's purchases did help ease financial conditions, especially in the aftermath of the crisis, when markets were rockiest and the term premium still fairly large, while subsequent rounds were of positive but diminishing value.[5] At their peak the cumulative impact in late 2012 or so, the Fed's asset purchases were estimated to be depressing the term premium on the 10-year Treasury yield by roughly 120 basis points (bps) (with benefits flowing through to broader financial conditions via portfolio rebalancing effects[6], reinforced signaling of "low for long" on the federal funds rate, and higher valuations of risk assets due to lower real Treasury yields). But the effects began to ebb as the Fed signaled and then halted purchases, leaking duration back into private hands, and then as investors started to digest the Fed's plans for runoff. By spring 2017, estimates suggest the effect on the term premium had been cut in half or more from the peak with knock-on effects to broader financial conditions shrinking too. The impacts have likely faded further as the Fed has carried through on the plans for runoff, and should largely be discounted by now in markets. Yes, there is still some scope for influence as policymakers clarify their intentions for the end of runoff, but the range of uncertainty about the ultimate size of the Fed's balance sheet is pretty modest (as we will see below), perhaps just 200 billion USD one way or the other, a tiny fraction of what the Fed bought, so it should make little difference for financial conditions.

Impact on the Fed's balance sheet

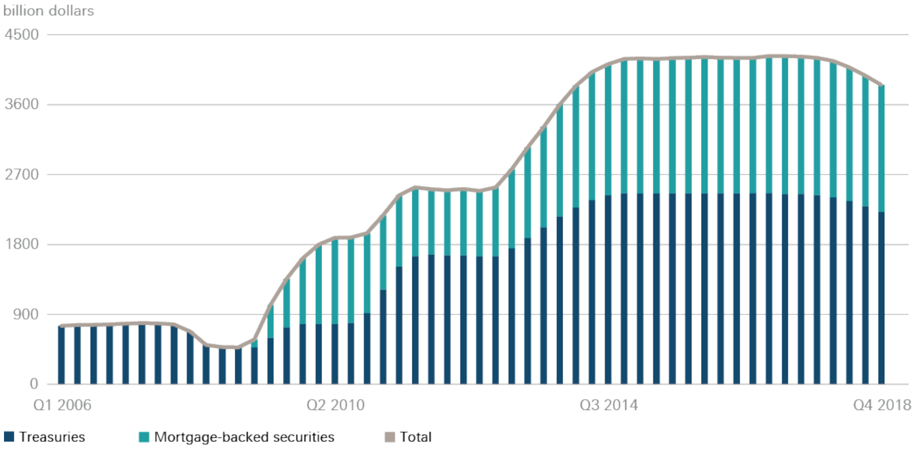
By the time the purchases stopped at the end of 2014, the Fed's holdings of securities had risen 3.4 trillion USD, to over 4.2 trillion USD, where they held through third quarter 2017 (as the Fed reinvested all the proceeds of maturing securities into new ones). There were of course correspondingly large changes on the liability side. The biggest by far was to reserve balances, which soared from under 10 billion USD to a peak of 2.8 trillion USD by the summer of 2014, as the Fed paid for the securities bought from private investors by crediting their banks' reserve accounts. Flooding the banking system with reserves was not the objective, nor a sign that policymakers' intentions were being thwarted – merely an accounting consequence of the Fed's purchases.

[4]The term premium is the amount by which the yield-to-maturity of a long-term bond exceeds that of a short-term bond. Since a short-term bond collects less coupons than a long-term bond, its yield-to-maturity is less. Coupons are the interest-rate payments made on a bond.

[5]See, for example: https://www.federalreserve.gov/econresdata/feds/2015/files/2015005pap.pdf https://www.federalreserve.gov/pubs/feds/2012/201257/201257pap.pdf

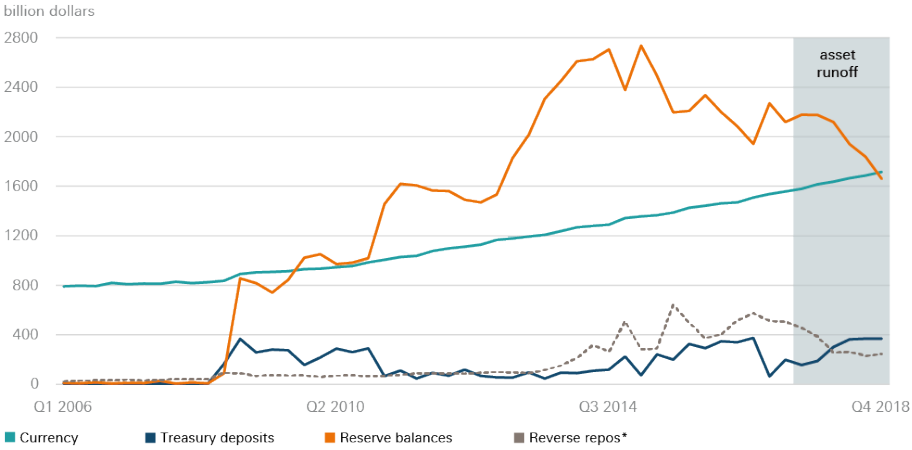
[6]Rebalancing is the process of realigning the weightings of a portfolio of assets.

Securities held outright by the Fed



Source: U.S. Federal Reserve Board as of 01/2019
* includes agencies

Key U.S. Federal Reserve Board liabilities



Source: U.S. Federal Reserve Board as of 01/2019
*includes banks' term deposits at the U.S. Federal Reserve Board

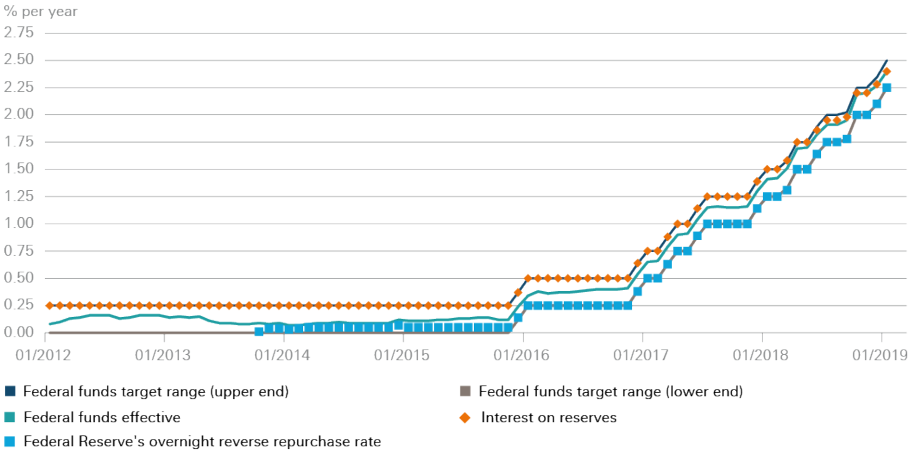
There was nothing the banking system could do to shed those reserves – only redistribute them from one bank to another. Almost all of the increase was in excess of what banks needed to meet their reserve requirements; though required reserves did rise sharply, due to large increases in transaction deposits partly resulting from solid loan growth, that increase was dwarfed by the surge in excess reserves. For all of that surge to have been converted into required reserves, transaction deposits would have had to leap by an astronomical 28 trillion USD (given a 10% reserve requirement); nobody would have wanted to hold all those deposits, and no credible lending opportunities of anywhere near that size were plausible. Banks did not hold lots of excess reserves because the Fed paid them to (much of the increase occurred when interest on reserves was near zero), nor did such holdings retard lending. They were just an inconsequential sideshow to the Fed's asset purchases.

Reserves would have increased even more had some not been absorbed by rapid growth in other Fed liabilities – particularly currency, and to a lesser extent the Treasury's deposits at the Fed (transferred from their deposits at banks, draining the latter's reserve balances), and reverse repos between the Fed and private counterparties (whereby the latter's reserve balances are temporarily debited in exchange for security collateral from the Fed). That is why reserves increased "only" 2.8 trillion USD by their peak in the summer of 2014 – roughly 0.5 trillion USD less than the Fed's asset purchases over that period – and edged down to 2.3 trillion USD over the next three years, even as the Fed's assets held steady.

New operating procedures

The Fed's asset purchases prompted policymakers to change how they exercise control over short-term interest rates. As the financial system became awash with reserves, the Fed would have had to drain enormous quantities before reserves became scarce enough to drive up the federal funds rate. Instead, the central bank now pays interest on reserves (IOR), and supplements that with a reverse repo (RRP) facility, where a broader array of financial institutions, including those not eligible for IOR, can participate, and policymakers set the IOR and RRP rates – the latter at the bottom of the federal funds rate target range, and the former toward the top of the range – to control short-term rates. When they want to raise the federal funds rate target, for example, they simply bump up the rates on both RRP and IOR by the desired amount and the federal funds rate moves up to trade within the new, higher range. Why? Because financial intermediaries do not want to lend at rates below what they can receive from the Fed. In fact, the federal funds rate was tending to trade towards the top of the 25 basis point target range – in part because a surfeit of Treasury-bill supply was putting upward pressure on short-term rates more generally – so policymakers now set the IOR rate ten basis points below the top of the desired range and that has helped to keep the federal funds rate trading closer to mid-range. All in all, this new operating system – akin to what many other central banks use – has worked well, enabling the Fed to control short-term interest rates even while retaining a large balance sheet, and without having to make frequent adjustments to reserves as in pre-crisis days.

Controlling the federal funds rate



Source: U.S. Federal Reserve Board as of 01/2019

The impact on Fed earnings

The Fed's earnings have been affected, though. The Fed earns interest on the securities it holds, and remits those proceeds – net

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of expenses – to the Treasury. Prior to the crisis, these remittances ran around 30 billion USD per year, but swelled to about 100 billion USD by 2014 to 2015 because the Fed held many more assets, and though their yields were well below pre-crisis levels, they were still far above those on the Fed's liabilities. But that gap began to narrow as the Fed lifted short-term rates, paying out more in interest on reserves and RRPs, eating into its net earnings, especially because the yields on the Fed's mostly longer-dated securities did not keep pace. Although many of the Fed's liabilities (e.g., currency, Treasury deposits) are still non-interest-bearing, which provides a substantial net interest margin, that cushion was much greater in the pre-crisis world, when none of the Fed's liabilities bore interest. In short, now that the Fed's balance sheet is so large, and many of its liabilities are interest bearing and essentially floating rate (and much shorter in duration than its assets), the Fed's net earnings are more sensitive to changes in interest rates. Remittances to the Treasury could shrink substantially in a rising-rate environment, and might even have to be temporarily suspended (in the unlikely event that the Fed's net earnings turned negative). Even in that extreme case, which a Fed study found to be quite unlikely,[7] there would be no material economic consequences. The Fed would simply resume remittances once net earnings swung back into positive territory (and the temporary loss of revenue to the Treasury would need to be weighed against years of elevated remittances, and the savings in interest costs that the Fed's asset purchases engendered). But there could be political fallout. Even if remittances merely slow, political pressure on the Fed might mount if it was seen as transferring vast sums to banks at the expense of the Treasury.

The balance-sheet runoff

As the economic recovery advanced and solidified, and the Fed began to raise the federal funds rate, policymakers also started to lay out plans for reducing the balance sheet. They felt that trimming their asset holdings would complement increases in the funds rate, providing a more balanced approach to scaling back policy accommodation. A smaller balance sheet would also reduce the Fed's footprint in financial markets, and afford policymakers more room to re-expand the balance sheet if needed to combat future downturns. Finally, a smaller balance sheet, with fewer interest-bearing reserves, would make the Fed's net earnings less volatile and interest sensitive, mitigating political risk.

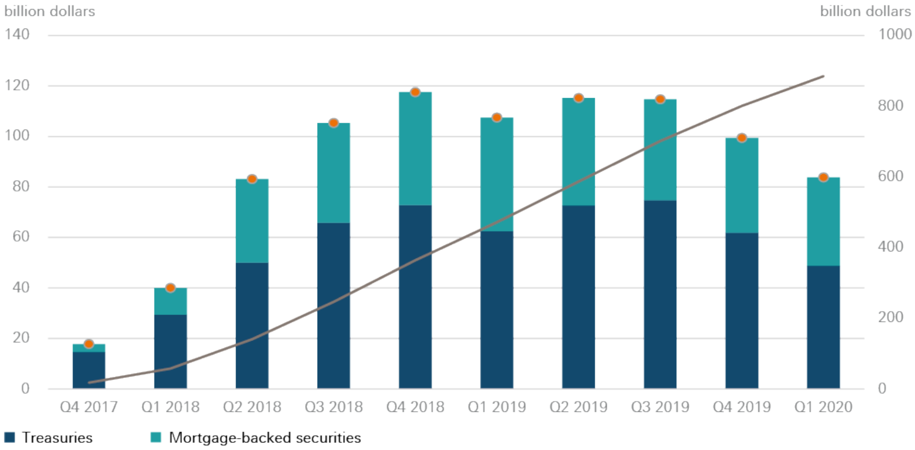
A formal plan for running down the balance sheet was approved by the Fed in September 2017. It hewed closely to principles already well telegraphed: the runoff would be gradual; there would be no outright sales of securities, only a slowing of the pace of reinvestments; the portion not reinvested would be capped, and the caps would rise gradually until peaking in October 2018 at 30 billion USD per month for Treasuries and 20 billion USD for MBS (though the actual amount of securities available for runoff will often be below these caps); the whole process would operate in the background, essentially on autopilot, subordinated to the federal funds rate, which would remain the primary lever to adjust

[7] https://www.federalreserve.gov/econresdata/notes/feds-notes/2017/confidence-interval-projections-of-the-federal-reserve-balance-sheet- and-income-20170113.html

monetary policy; only wholesale shifts in the economic outlook would cause the Fed to interrupt the path of runoff.

And that is how it has proceeded so far. From a start of 17 billion USD in Q4 2017, the drawdown of Fed security holdings increased incrementally until it reached 135 billion USD in Q4 2018, bringing the cumulative runoff to roughly 365 billion USD (nearly 2/3 Treasuries, 1/3 MBS). Reserves have come down even more, as some continue to be absorbed by increases in other Fed liabilities (especially currency). At under 1.7 trillion USD, reserve balances at the end of 2018 were roughly 1.1 trillion USD below their peaks, and largely as a result, the share of the Fed's liabilities that are interest bearing has slipped back below one-half, from a peak of roughly 70%, creating more of a buffer for Fed earnings. On the whole, the runoff has proceeded smoothly, as policymakers intended.

Actual and prospective runoff of Fed's securities



Sources: U.S. Federal Reserve Board, DWS Investment Management Americas Inc. as of 01/2019

When will it end?

The runoff will likely go on for a while. It will end before reserves get scarce, though, as Fed policymakers seem keen to preserve the current, abundant-reserves operating procedure, as it has been affording them good control of short-term interest rates without requiring the frequent adjustments to reserve levels that were needed when reserves were scarce. They have had no problem, for example, raising the federal funds rate, even with abundant reserves, by lifting the IOR and RRP rates (in fact, as noted the federal funds rate has tended to trade higher in the range, requiring the IOR rate to be shaded a bit lower). And should the Fed someday seek to lower the funds rate target, there will be no need to add lots of reserves to do so if they are abundant already.

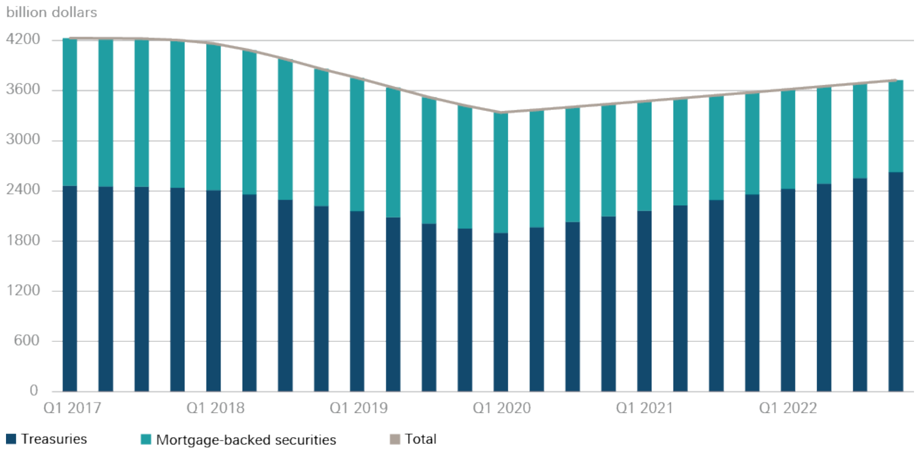
But just where is the threshold for reserve scarcity? How much reserves do banks want to hold? A lot more than prior to the crisis, because reserves are now interest bearing and are valued as a high-quality, liquid asset in the current regulatory environment. But just how much more is hard to say. Fed surveys and the recent behavior of money markets suggest that 1 trillion USD of reserves – plus or minus 10% or so – might provide an adequate cushion above the banking system's demand, but that figure is hardly set in stone, and may be updated as reserves edge closer to those levels.

When will that optimal level of reserves be reached? It depends not only on what that level is, but also on how quickly reserves are absorbed by growth in other Fed liabilities (like currency), and how fast the Fed's assets run off (Treasury maturity schedules are known in advance, but MBS prepayments are not). Our judgment is that reserves will enter the desired range sometime between late 2019 and mid-2020 – call it Q1 2020, plus or minus a quarter or so – by which time the Fed's security holdings will have run down between 800 billion USD and 1 trillion USD cumulatively. That means the current runoff, which is approaching 400 billion USD by the end of January 2019, is perhaps 40% to 50% complete. Again, there is some uncertainty here, and the Fed will likely provide updated guidance in the coming months, as the end of runoff approaches. But a difference of 200 billion USD or so one way or the other (plus or minus 5% of the Fed's holdings) is tiny, and should not have much impact on financial conditions. There is little doubt, moreover, that when it is over, the Fed's balance sheet will be far above what would have been consistent with pre-crisis trends. That is partly because the public wants to hold more currency than before (more than 8% of gross domestic product (GDP), compared to a bit more than 6% pre-crisis). But also because banks want to hold far more reserves, and the Fed wants to ensure that reserves remain abundant relative to demand.

After the runoff

Once the optimal level of reserves is reached, and the runoff ends, policymakers will manage the size of the Fed's portfolio to keep reserves adequate. That will likely entail occasional, modest increases in the Fed's asset holdings to keep pace with growth in currency and required reserves (as in pre-crisis days, albeit without the frequent, temporary transactions needed to manage reserves day to day). Also, policymakers might alter the composition of the Fed's holdings. In particular, they may opt to let MBS keep running off, replacing them with Treasuries, to reduce the Fed’s direct influence on the mortgage market. And they are apt to shorten the duration of the Fed's Treasury holdings, perhaps even including Treasury bills again in the portfolio, to better match the mix of overall Treasuries outstanding, reducing the Fed's direct influence on the Treasury market now, but increasing their scope to affect duration and the term premium again should some future exigency emerge. Absent that kind of crisis-mode easing, though, the Fed's balance sheet will become pretty static again – not increasing rapidly as in the aftermath of the crisis, not running off as at present. A welcome change.

Actual and prospective Fed holdings – Mortgage-backed securities likely to keep shrinking even after runoff ends



Sources: U.S. Federal Reserve Board, DWS Investment Management Americas Inc. as of 01/2019

Federal Reserve Balance Sheet (in billion dollars)*

	Treasuries and MBS** (Assets)	Other*** (Assets)	Currency (Liabilities)	Treasury deposits (Liabilities)	Reserve Repos**** (Liabilities)	Reserve balances (Liabilities)	Other***** (Liabilities)
Pre-crisis (Jun 2007)	789	76	812	4	30	10	5
Peak reserves (Jul 2014)	4097	310	1286	70	229	2786	36
Pre-runoff	4222	234	1580	155	455	2179	87
Current (Dec 2018)	3858	243	1716	368	245	1661	111
End of runoff (ca. Q1 2020)	3335	250	1855	305	180	1100	145

Sources: U.S. Federal Reserve Board, DWS Investment Management Americas Inc. as of 01/2019

*End of month levels

**held outright.

***includes loans, foreign currency, gold, SDRs, repos, Treasury coin outstanding, unamortized premiums less discounts on securities, and a few other miscellaneous items.

****and banks' term deposits at the Fed.

*****includes capital

Glossary

Accommodative

The aim of an **accommodative** monetary policy is to support the economy by means of monetary expansion.

Balance sheet

A **balance sheet** summarizes a company's assets, liabilities and shareholder equity.

Basis point

One **basis point** equals 1/100 of a percentage point.

Duration

Duration is a measure expressed in years that adds and weights the time periods in which a bond returns cash to its holder. It is used to calculate a bond's sensitivity towards interest-rate changes.

Excess reserves

Excess reserves are the capital reserves held by a bank or financial institution in excess of what is required by regulators.

Federal funds rate

The **federal funds rate** is the interest rate, set by the Fed, at which banks lend money to each other, usually on an overnight basis.

Financial crisis

The **financial crisis** refers to the period of market turmoil that started in 2007 and worsened sharply in 2008 with the collapse of Lehman Brothers.

Gross domestic product (GDP)

The **gross domestic product (GDP)** is the monetary value of all the finished goods and services produced within a country's borders in a specific time period.

Knock-on effects

A **knock-on-effect** is the effect which an action will have on other situations.

Liquidity

Liquidity refers to the degree to which an asset or security can be bought or sold in the market without affecting the asset's price and to the ability to convert an asset to cash quickly.

Monetary policy

Monetary policy focuses on controlling the supply of money with the ulterior motive of price stability, reducing unemployment, boosting growth, etc. (depending on the central bank's mandate).

Mortgage

A **mortgage** loan is used to finance the purchase of real estate.

Mortgage-backed security (MBS)

A **mortgage-backed security (MBS)** is a special type of asset-backed security where the holder receives interest and redemption payments from pooled mortgage debtors, secured by the underlying mortgages.

Special Drawing Rights (SDR)

Special drawing rights (SDR) are international reserve assets created by the IMF, which can be exchanged for the freely usable currencies of IMF members.

Technical analysis

Technical analysis is a tool used by capital market participants that want to forecast the development of security prices by detecting patterns in past market data such as prices and volumes.

Treasuries

Treasuries are fixed-interest U.S. government debt securities with different maturities: Treasury bills (1 year maximum), Treasury notes (2 to 10 years), Treasury bonds (20 to 30 years) and Treasury Inflation Protected Securities (TIPS) (5, 10 and 30 years).

U.S. dollar (USD)

The **U.S. dollar (USD)** is the official currency of the United States and its overseas territories.

U.S. Federal Reserve Board (the Fed)

The **U.S. Federal Reserve Board**, often referred to as "**the Fed**", is the central bank of the United States.

Valuation

Valuation attempts to quantify the attractiveness of an asset, for example through looking at a firm's stock price in relation to its earnings.

Yield

Yield is the income return on an investment referring to the interest or dividends received from a security and is usually expressed annually as a percentage based on the investment's cost, its current market value or its face value.

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