A User's Guide to Reducing the Federal Reserve's Balance Sheet

Alyssa G. Anderson, Alessandro Barbarino, Anthony M. Diercks, Stephen Miran

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Abstract

For the avoidance of doubt: 1) This catalog presents and analyzes a variety of options for reducing the Federal Reserve's balance sheet. **Nothing here is an endorsement of any specific policy option**; this is a menu of options. Combined, we estimate these options open the door to balance sheet reduction of $1.2 to $2.1 trillion within the Fed's current ample reserves framework. While we do not advocate for or against a return to a scarce reserves regime, further reductions would be possible with a return to scarce reserves. 2) The process of materially shrinking the balance sheet would require a great deal of implementation and rulemaking work in advance and would take time, **at least a year and quite possibly several, before the Fed can begin shrinking its balance sheet**. If undertaken, there are good reasons for moving slowly and gingerly, and to take steps to ensure financial markets are able to absorb the reissue of securities that roll off the Federal Reserve's balance sheet.

Contents

1   Introduction

Standard economics considers the supply of bank reserves to be set by the central bank, for purposes related to monetary policy implementation or targeting certain levels of overnight borrowing rates. In classic models like Poole (1968), reserve demand reflects the regulatory environment, economic activity, and longer-run trends like currency growth. However, traditional approaches typically treat the regulatory environment as fixed: an exogenous constraint rather than a policy instrument available to the central bank. The central bank adjusts reserve supply given demand to achieve its monetary policy objectives.

This traditional interpretation has given rise to a common view that the Federal Reserve is unable to reduce its balance sheet materially from current levels, given a demand curve that becomes steeper at lower levels of reserves.[1] After all, the Fed has tried to shrink its balance sheet before and each time ends up ceasing balance sheet reduction and abruptly reversing itself, expanding the balance sheet through reserve management purchases.

Challenges to this view have emerged in recent years, for instance in Logan and Schulhofer-Wohl (2018), Beckworth (2025), Miran (2025), Nelson (2026a) and Duffie (2026).[2] These papers argue that the demand for reserves is in large part, but not entirely, a function of the regulatory environment: banks are required by various regulations to hold certain levels of high-quality liquid assets, which can include reserves or Treasury securities. Of course, banks would naturally demand some level of reserves given their role in providing liquidity and processing payments, but the regulatory framework—both formal requirements and supervisory expectations—substantially amplifies baseline reserve demand. Miran (2025) dubs this "regulatory dominance" of the Fed's balance sheet. This view challenges the traditional one because it recognizes that central bank policy can affect not only the supply of reserves but also demand for reserves through its regulation and implementation policies. This recognition opens up the door to policies which aim explicitly at tamping that demand through regulatory and other tools.

Modern monetary policy implementation is defined by the boundaries between scarce, ample and abundant reserves, and those boundaries are in turn a function of the regulatory environment, precautionary demand for reserves, and other sources of reserve demand. Policy choices can shift those boundaries down, reducing demand for reserves.[3] Reductions in demand for reserves would allow further reductions in supply of reserves without unwanted stresses in short-term funding markets.

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[1]See, for instance, Cecchetti and Schoenholtz (2026).

[2]Duffie (2026) covers a number of items similar to what we do in this paper, was developed independently, and is coincidentally being released on the same day as this paper. We learned of Duffie's paper a few weeks before its release, scheduled to coincide with the Brookings Papers on Economic Activity conference. This paper was scheduled to be published to coincide with Governor Miran's speaking event at the Miami Economic Forum on the same day. Readers of this paper are highly encouraged to read Duffie's as well and should view them as complements. Logan and Schulhofer-Wohl (2018) provide another complementary and worthwhile analysis of a number of similar policy options.

[3]To be clear, we recognize the effects of these policy choices can extend well beyond the balance sheet. We touch on some of the broader implications later in the paper.

The purpose of this paper is to present a suite of policy options for reducing the size of the Fed's balance sheet, many of which aim to reduce the demand for reserves and shift those boundaries down. Nothing here should be considered advocacy or endorsement of any particular option. This paper is a catalog, and future Federal Reserve leadership will decide which, if any, options to pursue.

To be clear, we are not advocating for or against a return to scarce reserves. We are instead challenging the widespread assumption that further balance sheet reduction requires a return to scarcity. Either regime could support a smaller balance sheet based on the changes in policy we analyze in this study.

	Policy Options	Min	Mid	Max
1	**Recognize Discount Window Capacity in the LCR**	50	250	450
2	**Recalibrate LCR Requirements During Stress Periods**	50	125	200
3	**Reform ILST Expectations to Recognize DW Capacity**	50	125	200
4	**Revise Resolution Liquidity Requirements**	0	50	100
5	**SLR Relief for Dealer Intermediation**	–	–	–
6	**Equalize Supervisory Treatment of Treasury Bills and Reserves**	25	38	50
7	**Conducting Policy with EFFR Above IORB**	150	350	550
8	**Tiering Reserves**	–	–	–
9	**Expand Access to FIMA Repo Facility**	25	112	200
10	**Address FBO Reserve Demand w Swap Lines, Foreign Reg. Coord.**	–	–	–
11a	**Using Communication to Reduce Stigma of SRP**	–	–	–
11b	**Extending the SRP Borrowing Window and Central Clearing**	–	–	–
12	**Sterilize TGA Fluctuations with T-Bills**	50	125	200
13	**Implement a Liquidity Savings Mechanism for Fedwire**	100	112	125
	Total Reduction in Reserve Demand (Naïve Sum)	*500*	*1287*	*2075*
	Total Reduction in Reserve Demand (Monte Carlo Simulation Based)	**825**	**1287**	**1750**
14	**Recalibrate Treasury General Account (TGA) Management**	200	300	400
15	**Discourage Use of the Foreign Reverse Repo Pool**	0	50	100
	Total Estimated Reduction of Balance Sheet (Naïve Sum)	*700*	*1637*	*2575*
	Total Estimated Reduction of Balance Sheet (Monte Carlo Simulation Based)	**1150**	**1637**	**2125**

Table 1: **Policy Options and Estimated Effects**

Note: Estimates are in billions of dollars. Options with no numerical estimates reflect combinations with other options or were unable to be estimated with sufficient precision. The totals are computed based on Monte Carlo simulations of 1,000,000 draws and follow the standards set forth by OMB Circular A-4. The minimum of the totals reflects the 2.5[th] percentile and the maximum of the totals reflects the 97.5[th] percentile.

To evaluate the combined effect of the options presented in this study, we follow widely-adopted standards for federal policy analysis as outlined in the Office of Management and Budget (OMB)

Circular A-4. In particular, we employ Monte Carlo simulations for each policy's estimated range and calculate upper and lower bounds of the aggregate effects based on this approach. This probabilistic methodology yields an expected balance sheet reduction in the range of $1.2 to $2.1 trillion based on a 95% confidence interval. Table 1 is a preview of the breakdown of our estimates.

These numbers reflect a downward shift in the zone that characterizes ample reserves; further reductions could be achieved by a return to scarce reserves.

2   How We Got Here

2.1   Federal Reserve Balance Sheet

Before considering the paths available for balance sheet reduction, it is useful to briefly lay out the structure of the Federal Reserve's balance sheet. Table 2 provides a stylized version of the Fed's balance sheet. On the asset side, the Fed holds primarily Treasury securities and agency mortgage-backed securities. On the liabilities side, the balance sheet can be divided into two broad categories: reserve balances held by depository institutions, and non-reserve liabilities such as currency in circulation, the Treasury General Account (TGA), the foreign reverse repo pool and other liabilities. As shown in Table 2 and Figure 2, these non-reserve liabilities are currently comparable in size to reserves.

Thus, policy options for reducing the balance sheet either involve reducing the demand for reserves or reducing other liabilities outside the domestic banking system. This section explains how we arrived at current balance sheet levels, with emphasis on the evolution of reserve demand.

Assets	Value (Billions)	Liabilities & Capital	Value (Billions)
U.S. Treasury Securities	$4,352	Reserve Balances	$3,073
Agency Securities (MBS)	$2,010	Currency	$2,390
Other Assets	$284	Treasury General Account (TGA)	$806
(incl. discount window,		Foreign Reverse Repo Pool	$325
SRP, and FIMA repo)		Other Liabilities & Capital	$52
		(incl. ON RRP)	
Total Assets	**$6,646**	**Total Liabilities & Capital**	**$6,646**

Table 2: **Federal Reserve Balance Sheet**

Note: This table is based on data from the Federal Reserve's H.4.1 release for the week ending March 11, 2026.

2.2 Evolution to the Current Implementation Framework

There are three possible characterizations of modern monetary policy implementation: scarce reserves, ample reserves, or abundant reserves. Scarce reserves policy requires frequent intervention from the central bank if it is to make sure policy rates are where they ought to be, while abundant reserves is governed by administered rates that create arbitrage opportunities and keep the policy rate where the central bank wants without any active intervention. As seen in Figure 1, when reserves are scarce, the market is on a steeply downward sloping part of the demand curve for reserves, and short rates are highly sensitive to fluctuations. When reserves are abundant, the market is on a flat part of the demand curve for reserves, and short rates are unresponsive to fluctuations.
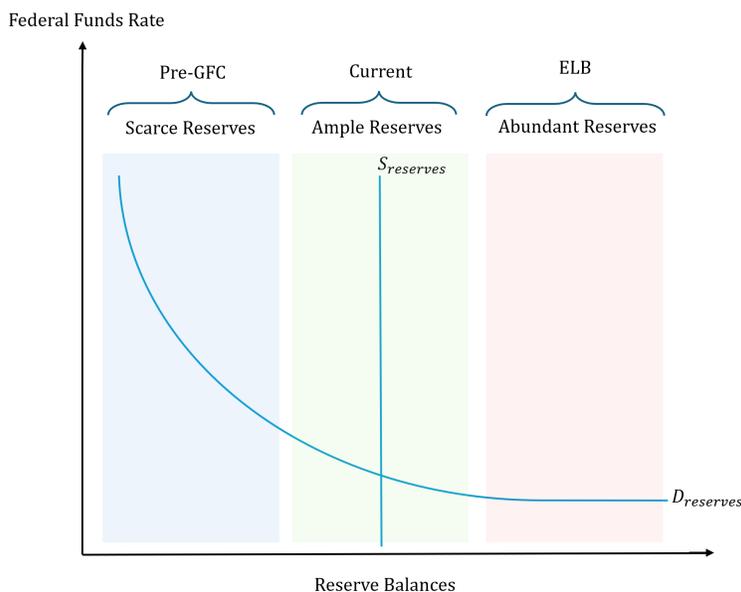
Figure 1: **Demand and Supply Curve for Reserves**

Note: Pre-GFC corresponds to the period prior to the Global Financial Crisis in 2008. ELB stands for the effective lower bound. The flat portion of the demand curve corresponds to an abundant reserves framework, the middle portion corresponds to the current environment of ample reserves, and the steepest portion reflects a scarce reserves regime.

Defining ample reserves. Ample reserves is more difficult to define, but most people accept that ample reserves are at a high enough level that short rates are minimally responsive to typical day-to-day fluctuations, but rates do respond to sharper fluctuations. Ample is the band that separates scarce from abundant, and the demand curve for reserves is modestly downward sloping.[4]

The EFFR-IORB spread. We can also conceive these categories in terms of prices. The Federal Reserve's target rate, the effective fed funds rate (EFFR), is the rate at which banks borrow reserves from each other. With ample reserves, EFFR is close to the interest rate on reserve balances (IORB)

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[4]See Afonso, Kim, Martin, Nosal, Potter and Schulhofer-Wohl (2020), Ihrig, Senyuz and Weinbach (2020), Logan (2019), Haubrich (2025), Hammack (2025), Powell (2025), Perli (2025), Remache (2025), Waller (2025), and Williams (2025) for some useful discussions of the ample reserves framework.
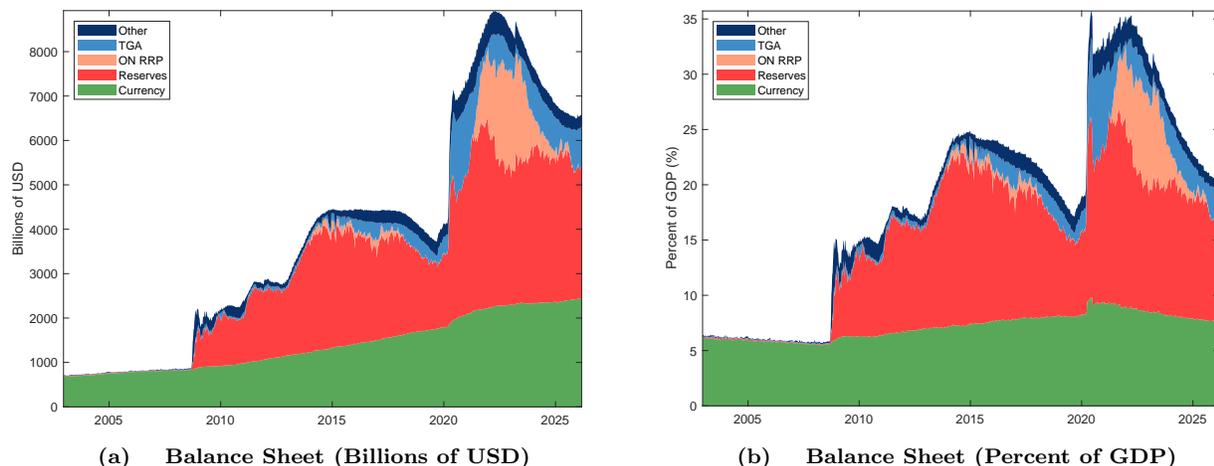
Figure 2: **Balance Sheet Liabilities Decomposition**

Note: Panel (a) shows a decomposition of the balance sheet liabilities from 2003 to present in billions of USD. Panel (b) shows the same decomposition but as a ratio of nominal GDP. The individual components are from the St. Louis FRED database and are averaged at a weekly frequency. Source: Federal Reserve Bank of St. Louis FRED: WCURCIR, WRESBAL, WREPODEL, WTREGEN, WLTLECL, GDP.

as the marginal value of additional reserves is close to zero. When reserves are scarce, EFFR trades above IORB, as lenders require higher yield to loan out their reserves. When reserves are abundant, EFFR trades below IORB, as few need to pay high yields to borrow reserves.

After the pandemic-era asset purchases, reserves were abundant, with large volumes of overnight reverse repo (ON RRP) take-up—that is, non-banks lending excess cash to the Fed—and EFFR regularly clearing roughly 7 basis points below IORB for several years. Now, we've returned to ample reserves, with EFFR trading just one basis point below IORB.

Scarce reserves. Prior to the Global Financial Crisis (GFC), the Federal Reserve operated under a scarce-reserves regime, and the Fed's balance sheet was about $900 billion, or 6% of GDP (see Figure 2). Depository institutions were required to hold a certain level of reserves against certain of their liabilities, and borrowed and loaned reserves in the federal funds market to hit those requirements. The Fed manipulated aggregate reserve balances to keep the fed funds rate at a target rate consistent with its monetary policy objectives.

The shift to abundant reserves. In response to the GFC, the Fed embarked on a dramatic course of balance sheet expansion. This boosted reserves above the level required by banks moving the supply of reserves on the flatter portion of the demand for reserves away from the scarce reserves region, and the balance sheet reached 15% of GDP after the conclusion of the first round of quantitative easing and emergency liquidity operations (see Figure 2). Reserves had become abundant. As a consequence, without additional tools, the Fed would have been unable to achieve a fed funds rate consistent with its monetary policy objectives if it subsequently desired to tighten policy.

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Floor system. To help control the fed funds rate, the Fed introduced a floor system of administered rates, as had been done by a number of other central banks around the world. IORB provides an imperfect floor on the policy rate and the rate on overnight reverse repurchase agreements (ON RRP) serves as a subfloor. The primary credit rate of the discount window and the rate on standing repurchase agreements (SRP) provide ceiling support. This creates a complex system of arbitrage opportunities that arise if EFFR deviates from where the Fed wishes it to be, effectively keeping the policy rate near IORB and preventing loss of interest rate control.

The return to ample reserves. Since the GFC, the Fed expands its balance sheet when it needs to stimulate the economy if policy rates are stuck at the zero lower bound, then shrinks the balance sheet when the economy has recovered. The FOMC ends the process of balance sheet reduction when indications of reserve scarcity emerge, because the Fed has chosen to maintain an ample reserves framework.

The Fed's first experience with balance sheet reduction was from 2017 to 2019. Quantitative tightening ended in August 2019, at which point the asset side of the balance sheet stopped declining. However, non-reserve liabilities such as currency continued to grow, causing reserves to decline further despite the ending of asset runoff.[5] This decline culminated in the money market stress episode of mid-September 2019 when repo rates and EFFR spiked (see Figure 4).[6] In response, the Fed conducted large repo operations and later began purchasing Treasury bills to maintain an ample supply of reserves.

Following the aftermath of the pandemic, the balance sheet reached a high of 36% of GDP, and the Federal Reserve subsequently began allowing securities to roll off its balance sheet.[7] In late 2025, after quantitative tightening had been underway for about three years, trillions of dollars of Treasury repo transacted more than ten basis points above the SRP rate on high-pressure days, indicating that the Federal Reserve's control over short-term rates was becoming looser and that reserves were verging on scarcity.[8] The Fed subsequently began purchasing Treasury bills to increase the supply of reserves and restore proper system functioning, lest it be forced into the types of direct interventions that would have been typical under a scarce-reserves regime. These actions were taken to ensure that reserves remained ample.

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[5]For instance, the Federal Reserve introduces currency into circulation by ordering new notes from the Bureau of Engraving and Printing and purchasing coins from the U.S. Mint, then distributing them to depository institutions (commercial banks, credit unions) to meet public demand. The Fed swaps this cash for funds in the banks' reserve accounts thereby reducing reserves.

[6]For analysis of developments in money markets around September 2019, see Anbil, Anderson and Senyuz (2020) and Afonso, Cipriani, Copeland, Kovner, La Spada and Martin (2021).

[7]Eyal, Na and Skaperdas (2026) decompose the roughly 15 percentage point decline from the pandemic peak to current levels, finding that active reductions in securities holdings account for the majority of this decline, with inflation and real GDP growth playing a secondary role.

[8]High-pressure days are those with high payment flows due to Treasury settlement, tax payments, or temporarily tighter balance sheet constraints that limit dealer intermediation, resulting in temporarily higher short-term rates and greater rate volatility.

Not purely quantities. With these considerations in mind, there are clear distinctions between the level of reserves, the frequency of interventions, and the sensitivity of interest rates to the supply of reserves. With a high demand for reserves for a given EFFR, effective reserves in the system can appear to be large but still be "scarce" so that interest rate volatility is high and frequent interventions by the central bank are necessary. The reverse can also be true. This dynamic is key to the mechanisms we propose for reducing the quantity of reserves necessary for an ample reserves implementation framework.

2.3 Fluctuations in Reserve Demand

Attractive features of reserves. Banks hold reserves for precautionary reasons, self-insuring against states of the world in which their reserves fall and bring HQLA below levels required by regulations.[9] Several fundamental features make reserves particularly attractive for this purpose compared to alternative forms of high-quality liquid assets. First, they provide an immediate store of value which is stable over time. Second, reserves eliminate settlement dependency risk. Unlike daylight overdrafts, they do not carry operational risk if offsetting trades fail to settle. Third, they have no interest rate risk and require no selling of securities to monetize. This makes them ideal for managing stress scenarios and payment outflows and settlement needs.

Cyclical and Seasonal Liquidity Needs. Banks' demand for reserves fluctuates with predictable economic patterns. Banks experience notable deposit outflows during predictable events like the April 15 tax season and year-end when customers withdraw funds for tax obligations or corporations make cash management decisions. These outflows temporarily increase banks' precautionary demand for reserves to ensure adequate liquidity buffers, as unexpected shortfalls could necessitate costly overnight borrowing or use of Federal Reserve lending facilities with their associated stigma.

The velocity of money amplifies these dynamics. During periods of higher economic activity and faster payment turnover, banks require additional reserve buffers to manage increased transaction volumes. Conversely, when economic activity slows, precautionary demand may moderate as payment flows become more predictable.

2.3.1 Pre-Crisis

Demand for reserves has changed dramatically over the past 20 years. Prior to the GFC, demand for reserves was mainly a function of banks fulfilling their statutory reserve requirements (Judson and Klee, 2009). Banks faced high opportunity costs of holding reserves as they received no interest at the time, and this incentivized banks to allocate available funds toward interest-bearing activities and securities. While the amount of reserves on the Federal Reserve's balance sheet was often less

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[9]See Afonso and Lagos (2015) for further analysis of the precautionary motive to hold reserves in the federal funds market.

than $10 billion, this likely understated how much banks demanded reserves for operational needs like intraday payments or transactions.

Daylight overdrafts. Prior to 2009, when reserves were scarce, banks made heavy use of daylight overdrafts to fulfill their payment obligations, as seen in Figure 3 panel (a). Daylight overdrafts occur when a bank's reserves fall below zero temporarily. The intraday peak quantity of overdrafts reached as high as $200 billion (a non-trivial amount at close to 2% of GDP) in the first half of 2008, at a time when bank reserves still averaged around $10 billion. This stark contrast—$200 billion in intraday overdrafts versus $10 billion in reserves—reveals that banks' true liquidity needs far exceeded their end-of-day reserve holdings.

2.3.2 Post-Crisis

Interest on reserves. While the above features make reserves attractive, they cannot explain why demand surged after the GFC. Instead, the landscape for reserve demand fundamentally changed when the Federal Reserve began paying interest on reserve balances (IORB) in October 2008. This decision was necessary to implement monetary policy more effectively, as paying IORB helped set a floor on the federal funds rate. Critically, the introduction of IORB transformed reserves from a non-interest-bearing operational necessity into a portfolio asset that could compete with other safe investments on a risk-adjusted return basis.

Portfolio perspective. Paying interest on reserves opened up entirely new demand from a portfolio optimization perspective.[10] For instance, for much of 2013 to 2018, the IORB rate exceeded the 1-month and 3-month Treasury bill rate, as shown in Figure 3 panel (b). From a risk/return perspective, reserves during this period were superior to T-bills along both dimensions—they had lower volatility and higher expected returns. Ihrig, Kim, Vojtech and Weinbach (2018) formalize this intuition using portfolio theory, showing that risk-averse banks would rationally hold reserves well beyond regulatory requirements depending on financial market volatility and their risk tolerance.

Relative pricing dynamics. The spread between IORB and alternative short-term rates has become a key driver of reserve demand. When alternative rates exceed IORB, banks have strong incentives to shift funds out of reserves. At times in 2019 when repo rates exceeded IORB, Jamie Dimon, the CEO of the nation's largest bank, suggested that it might make financial sense to move away from reserves to repo.

This dynamic has played out over longer time horizons as well. Nelson (2026a) documents that JPMorgan Chase has reduced its reserve balances by 75 percent—approximately $300 billion—over the past few years as persistent shifts in market conditions have made alternative investments more

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[10]See Rezende, Temesvary and Zarutskie (2019) and Hendrickson (2017) for empirical evidence on how IORB affects reserve demand and daylight overdrafts, respectively.
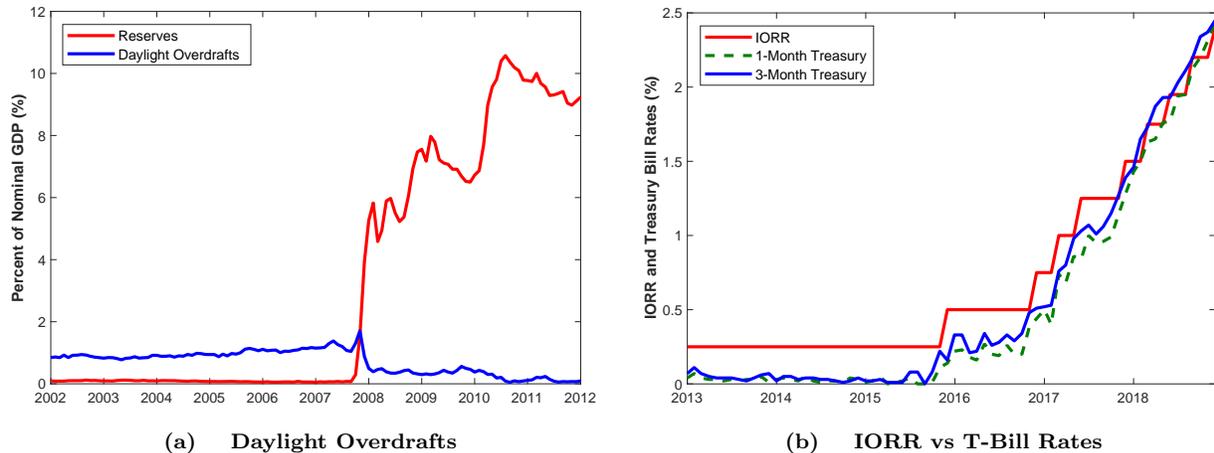
Figure 3: **Daylight Overdrafts versus Reserves and Relative Pricing Dynamics**

Note: Panel (a) shows the daylight overdrafts as a percent of GDP (blue line) along with the level of reserves as a percent of GDP (red line) for 2002 to 2012. In panel (b), the interest on required reserves (red line) is plotted against the 1-month and 3-month Treasury bill rates for 2013 to 2019. IORR denotes interest on required reserves, the historical predecessor to today's interest on reserve balances (IORB); the figure uses the earlier term because it refers to that historical period. Source: Federal Reserve Bank of St. Louis FRED: WRESBAL, IORR, DGS1MO, DGS3MO; Federal Reserve Board of Governors, "Peak and Average Daylight Overdrafts and Related Fees"

attractive relative to IORB. The importance of these relative pricing dynamics has been widely recognized in the literature as a key driver of bank reserve demand (e.g., see Lopez-Salido and Vissing-Jorgensen (2025); Anderson and Na (2024); Nelson (2024)).

Regulations. Following the GFC, banks have been subject to a number of new liquidity and capital regulations that have increased or otherwise influenced the demand for reserves (see Ihrig (2019) for a nice overview). The six main regulations that drive this dynamic are (1) the liquidity coverage ratio (LCR), (2) internal liquidity stress tests (ILSTs), (3) resolution plans and their related liquidity expectations, (4) the net stable funding ratio (NSFR), (5) the supplementary leverage ratio, and (6) the global systemically important bank (GSIB) surcharge.

While we will go into more detail about each of these items in the following section, these regulations were designed to improve bank resiliency in the face of financial market volatility. Banks have responded to these regulations by holding significantly larger quantities of reserves than they did prior to the GFC. Reserves provide immediate liquidity in times of stress and do not face the stigma associated with tapping Federal Reserve lending facilities such as the discount window, standing repo operations, and daylight overdrafts.

Stigma of lending facilities. Banks tend to treat the discount window as a last resort due to persistent stigma (see Carlson and Rose (2017)). This dynamic has recently been highlighted in considerations for liquidity regulation (see Bowman (2026b)). This stigma stems from multiple sources. The discount window has an above market rate, suggesting that banks would only use it if they have no other options. Further, discount window borrowing has been associated with

previously failing banks. Finally, banks fear that discount window usage may trigger heightened supervisory scrutiny, signal weakness to examiners, or lead to deposit outflows, even if the borrowing is purely precautionary.[11] This stigma makes banks reluctant to access the window even when genuinely needed, leading them to hold larger precautionary reserve buffers rather than rely on the discount window as intended.

This stigma discourages banks from using the discount window since their usage may be revealed through several channels. First, weekly aggregate data published by each Reserve Bank can allow market participants to infer which institutions are borrowing (see Kelly (2024)). Second, Dodd-Frank mandates disclosure of individual borrower names with a two-year lag. Even these delayed disclosures create concerns about future reputational damage. Third, market participants and counterparties may detect discount window usage through trading patterns or balance sheet changes, generating rumors that a bank is experiencing distress.

The stigma of using Federal Reserve lending facilities has played a meaningful role in driving up demand for reserves. As previously noted, daylight overdrafts used to be a common way for banks to meet their intraday obligations, but now some banks view their usage as undesirable (Levy, 2025).[12] According to the latest survey conducted by the Bank Policy Institute, avoiding daylight overdrafts and avoiding borrowing from the discount window were among the top reasons for the demand of reserve balances. Stigma has also been associated with the use of the standing repo operations, as has been highlighted by Nelson and Parkinson (2022).

Fragmentation. As also highlighted in Åberg, Corsi, Grossmann-Wirth, Hudepohl, Mudde, Rosolin and Schobert (2021), during periods of market stress, financial "fragmentation"—where banks face unequal access to funding—drives up the demand for bank reserves. First, a "flight to safety" prompts healthy banks to hoard highly secure reserve balances instead of lending them to other institutions. Simultaneously, distressed banks are frozen out of private interbank markets due to perceived risks, forcing them to borrow directly from the Fed to survive. Together, this hoarding by safe banks and emergency borrowing by vulnerable banks causes overall reserve demand to surge.

Uninsured bank deposits. Acharya, Chauhan, Rajan and Steffen (2024) find that banks tend to offer more credit lines and uninsured deposits when the supply of reserves becomes large. With these new products in place, it incentivizes banks to hold even larger supplies of reserves to offset any potential liquidity risks associated with subsequent withdrawals. These changes in bank behavior make it difficult for banks to reduce their quantity of reserves, and this issue has also been highlighted in Copeland, Duffie and Yang (2025).

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[11] See, among others, Armantier, Ghysels, Sarkar and Shrader (2015), Ennis and Klee (2025) and Anbil (2018) for more details.

[12] Daylight overdrafts may increase the likelihood that the bank ends the day in a deficit and has to go to the discount window or pay a very high overnight overdraft fee.

2.3.3 Indicators of reserve ampleness

Understanding the binding constraint on balance sheet reduction requires examining how depository institutions' demand for reserves has evolved. When the Fed initially shrinks its balance sheet, the ON RRP is the first liability to fall.[13] Once the ON RRP declines to minimal levels, further balance sheet reduction directly reduces bank reserves, all else equal. The constraint emerges (along with the associated volatility) when reserve supply approaches the minimum level banks collectively need for operational, regulatory, and precautionary reasons. Afonso, Clark, Gowen, La Spada, Martinez, Miu and Riordan (2024), Clouse, Infante and Senyuz (2025), and Gissler, Hempel, Kahn, McCabe and Narajabad (2025) have highlighted a number of measures that can indicate when reserves are becoming relatively more scarce:

1. **Elasticity** – Measures the response of EFFR to changes in reserves.[14] If this is close to zero, it indicates there may be room to lower reserves without affecting EFFR. See Figure 5 panel (a).

2. **Late Payments** – Share of interbank payments settled after 5 p.m. As the share of late payments increases, this indicates that banks are delaying payments due to more constrained liquidity.[15]

3. **Daylight Overdrafts** – Dollar value of banks' intraday overdrafts. If this increases, it indicates depository institutions need to borrow more to meet liquidity needs.

4. **Share of Fed Funds Purchased by U.S. DIs** – If domestic banks are borrowing more in the fed funds market, it could indicate they may be liquidity-constrained and seeking reserves.

5. **Share of Repo Volume at or above IORB** – Repo is a close substitute to fed funds. Increases in the share of repo volume at or above IORB could reflect liquidity constraints of large bank intermediaries due to lower reserve levels.

During the volatility of September 2019, spreads such as the EFFR-IORB and TGCR-IORB skyrocketed (see Figure 4). Moreover, each of the indicators listed above implied that reserve demand was on the downward-sloping portion of the demand curve, meaning reserves were becoming increasingly scarce (see Afonso, Clark, Gowen, La Spada, Martinez, Miu and Riordan (2024)).

The end of the second quantitative tightening episode in late 2025 showed a somewhat different pattern. The share of repo volume at or above IORB emerged as the primary signal of tightness, while other measures of depository institution reserve demand showed less pronounced changes. The December 2025 FOMC minutes also emphasized the repo market dimension, noting that repo rate volatility and sensitivity to Treasury coupon issuance pointed to reserves becoming less ample.

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[13]The ON RRP declines first because it is the most rate sensitive liability. As the rates on other investments, such as Treasury repo, become more competitive, investors shift out of the ON RRP.

[14]Some additional elasticity indicators can be found at https://j-kahn.com/repoelasticity/.

[15]Ferris, Rose and Tase (2025) presents a similar indicator based on a bank's ratio of reserves to payments.
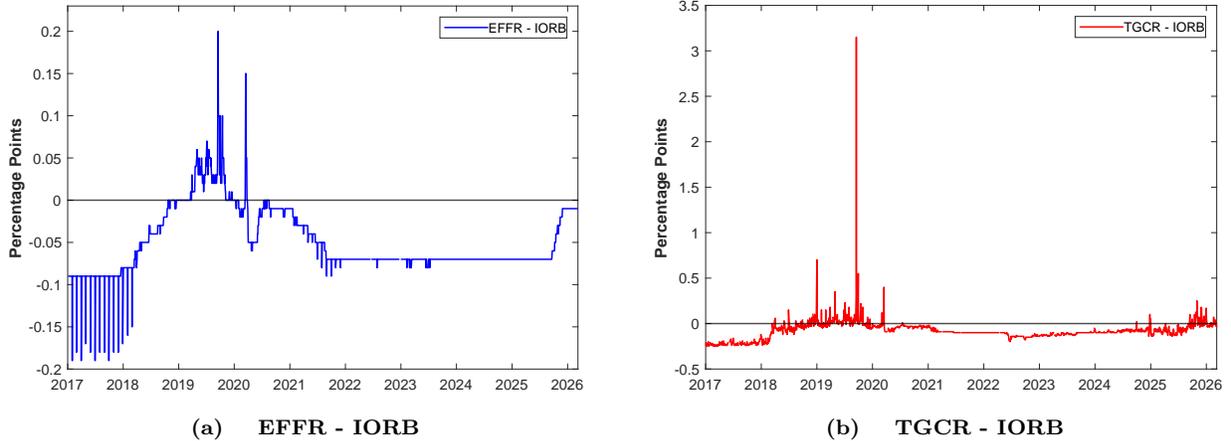
Figure 4: **Overnight Spreads to Interest on Reserve Balances**

Note: Panel (a) shows the spread between the effective federal funds rate (EFFR) and the interest on reserve balances (IORB). Panel (b) shows the spread between the Tri-Party General Collateral Rate (TGCR) and IORB. Source: Federal Reserve Bank of St. Louis FRED: EFFR, IORB RATE, IOER RATE, TGCRRATE

The repo market channel. This pattern suggests, in the most recent episode, constraints in the repo market's capacity to absorb Treasury securities rolling off the Fed's balance sheet was a key limiting factor in how far the Fed could shrink its balance sheet (see Anbil, Anderson, Cohen and Ruprecht (2024)). As Treasury securities shift from the Fed to the private sector, dealers require more financing in the repo market to hold and intermediate these securities. This increased demand puts upward pressure on repo rates and amplifies their volatility (see Figure 5 panels b and c).

When repo rates rise or become sufficiently volatile, they can transmit pressure to the fed funds market and push the EFFR higher, consistent with the dynamics observed last fall. That said, banks' unwillingness to arbitrage elevated repo rates—even when profitable—could reflect underlying reserve demand, complicating the distinction between these two channels. We cannot conclude from repo volatility alone that the Fed's balance sheet was unable to be reduced further. If precautionary demand for reserves were lower, it would allow less constrained banks to neutralize shocks by lending into the repo market, which would lower the level of the balance sheet at which repo volatility manifested.

While distinguishing between reserve demand and intermediation bottlenecks may seem like a minor detail, it highlights a critical point: the potential policy changes discussed in subsequent sections must apply not only to depository institutions but also to bank holding companies and their dealer affiliates. These affiliated dealers play the dominant role in providing capacity to the repo market. Excluding them from policy adjustments could severely limit the effectiveness of broader efforts to reduce the balance sheet.

(a) Elasticity   (b) Vols. of Spreads   (c) SOFR 75th percentile - SRP
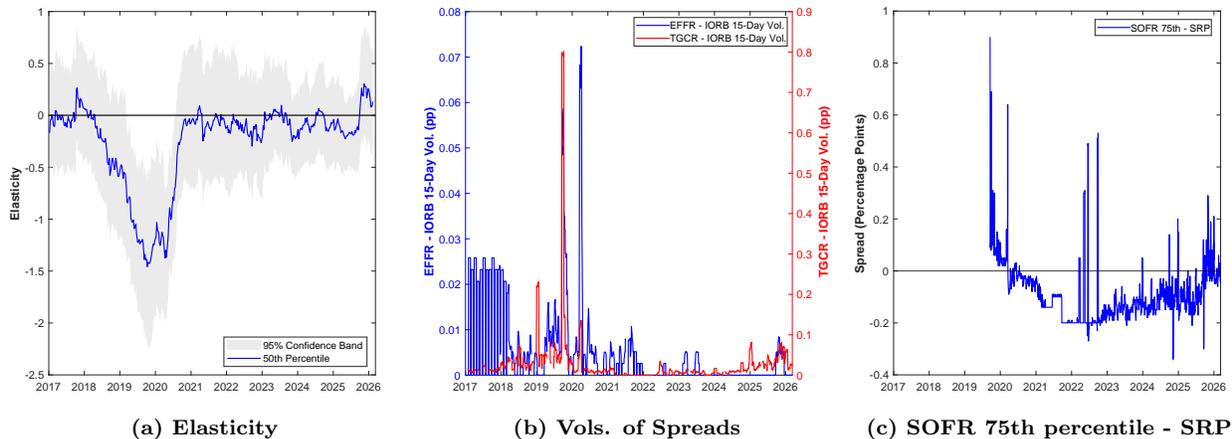
Figure 5: **Spreads with Interest on Reserve Balances**

Note: Panel (a) shows the elasticity of the federal funds rate with respect to reserve demand as estimated by FRBNY. Panel (b) shows the 15-day rolling standard deviation of the EFFR-IORB and TGCR-IORB spreads. Panel (c) shows the 75th percentile of the SOFR distribution minus the SRP rate. Source: Federal Reserve Bank of New York, Reserve Demand Elasticity, https://newyorkfed.org/research/reserve-demand-elasticity/. Daily data on reserves and the fed funds rate are collected by the Federal Reserve Bank of New York; the daily interest rate on reserve balances is available from FRED ("IOER" and "IORB"). Panel (b): Source: Federal Reserve Bank of St. Louis FRED: EFFR, IORB, IOER, TGCR. Panel (c): Federal Reserve Bank of New York, SOFR 75th percentile from https://www.newyorkfed.org/markets/reference-rates/sofr and SRP rate from https://www.newyorkfed.org/markets/desk-operations/repo.

3   Motivating a Smaller Balance Sheet

3.1   Why Shrink the Balance Sheet?

Reducing the Fed's footprint.   There have been many reasons proposed for shrinking the balance sheet. First, it would reduce the Fed's footprint in the economy.[16] By buying a large quantity of outstanding securities, the Fed modifies the market pricing of such securities and the availability of those securities in the market. Further, a large balance sheet can lead to disintermediation in money markets including the near disappearance of interbank markets.[17] There aren't convincing arguments that money markets, with appropriate policy changes, would require a larger steady-state balance sheet to provide sufficient liquidity. Markets are better than central planners at allocating resources. Accordingly, a larger Fed footprint in markets likely leads to larger, welfare-reducing distortions.

Policy space.   Second, a smaller balance sheet provides more policy space in the future to expand the balance sheet.[18] There may come a time when policy rates are again at the effective lower bound and the Fed needs to expand the balance sheet to avert dire outcomes. In such a contingency and

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[16]See Duffie et al. (2016), Bailey (2024), and Duygan-Bump and Kahn (2026) for further discussion.

[17]See Kim, Martin and Nosal (2020) for a discussion of how a large Fed balance sheet reduced interbank trading.

[18]For recent discussions highlighting the benefits of "policy space" see Bullard (2017), Laubach and Potter (2018) and Bowman (2025). Officials from other central banks such as the BIS and ECB have made similar arguments, see Borio (2018) and Schnabel (2023).

given likely diminishing returns, balance sheet expansions will be more effective if they start from lower levels of holdings. They'll also be politically easier. Finally, there will be a greater universe of securities available for purchase. Critically, this "dry powder" argument requires offsetting any contractionary effects of balance sheet policy with changes to interest rates; this is not an argument for running tighter monetary policy in the short-run.

Maintaining the monetary-fiscal boundary. Third, it would mitigate concerns associated with Fed independence and firm up the boundary between monetary and fiscal policy.[19] Since the provision of public debt and the choice of its maturity structure is the responsibility of the fiscal authority and not the monetary authority, some view the Fed as stepping out of its lane when it begins taking steps that alter the results of those decisions. That potential interference requires, to an extent, cooperation with the fiscal authority, which could corrode the independence of monetary policy from the rest of the government. Less monetary intervention in the maturity structure of public debt will strengthen the wall between monetary and fiscal policy and help preserve monetary independence.

Preserving neutrality across sectors. Relatedly, the purchase of mortgage-backed and other asset-backed securities involves the Fed in credit allocation across sectors. When housing and credit were the center of the GFC, there was a strong financial stability and market functioning argument for buying mortgage-backed and asset-backed securities.[20] But in subsequent large scale asset purchases, this was not the case, and the justification offered for buying mortgage-backed securities was largely the dual mandate.[21]

Credit was preferably injected into the housing sector relative to other sectors of the economy at a time when financial stability concerns in the housing sector had largely subsided, giving the appearance that the central bank was involved in central planning of the economy. Shrinking the Fed's holdings of mortgage-backed securities would undo this credit allocation and minimize Fed-induced, welfare-reducing distortions.[22] For the Fed to remain nonpolitical and independent, it is preferable to avoid the subsidization of credit for one particular sector of the economy when there is little financial stability reason for doing so. Elected officials, not central banks, typically make such choices.

Additionally, a smaller balance sheet will mean smaller IORB payments to banks, which some in Congress perceive as a subsidy to the banking system. A return to scarce reserves could eliminate

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[19] For some previous acknowledgments of this issue, see Allison et al. (2013), Dudley (2013), Leonard, López-Salido and Natalucci (2016), and Labonte (2023).

[20] Non-mortgage ABS were bought in emergency facilities under section 13(3) of the Federal Reserve Act, but nevertheless contributed to a larger balance sheet. These no longer exist on the balance sheet, but the avoidance of such assets remains a general good principle. Of course, emergencies sometimes occur which justify deviation from this principle.

[21] Market functioning played a large role in purchases in early 2020, but these concerns dissipated shortly thereafter.

[22] The Fed has stated its goal to hold primarily Treasury securities in the long run and is currently reducing its agency mortgage-backed securities holdings by reinvesting them into Treasuries. However, this compositional shift will take many years to complete (see Na, Newman and Schlusche (2024)).

the need for IORB payments altogether.

Limiting exposure to losses. Finally, balance sheet reduction will limit the scope for losses for the Fed in the future. With a large balance sheet, modest deviations between the interest the Fed pays on reserves and the interest the Fed receives on its securities can lead to large unrealized losses, as they did in the aftermath of the hiking cycle which began in 2022.[23] While a central bank can in theory operate with an infinitely negative capital position, those losses may impugn the Fed's credibility and competence in the public mind and thereby threaten its independence and scope for effective action. They also induce volatility in the remittance of operating profits to the Treasury, since those profits are delayed until the Fed recoups its losses. Volatility in profit remittance induces additional volatility in fiscal deficits, which has its own set of consequences. Indeed, operating profits may also be less frequent with a smaller balance sheet.[24]

3.2 What Does It Mean to Shrink the Balance Sheet?

Typically, when people discuss further reductions in the balance sheet, they contemplate a return to scarce reserves. This of course is possible, but would require the Fed and markets to return to daily or near-daily open market operations, daylight overdrafts, active intervention in markets, and, critically, increased volatility of short rates around the Fed's targets. Moreover, a return to scarce reserves may not actually accomplish much balance sheet reduction as long as the demand for reserves is steep and fixed by regulations at a high level; there is a chance that scarce may not be so far away.

Boundaries defining ample can shift. Consistent with the view that steady-state reserve demand is determined in large part but not entirely by regulation and other policy choices, a return to scarce reserves is not the only way to resume balance sheet runoff. Modern monetary policy implementation is defined by the boundaries between scarce, ample and abundant reserves. Those boundaries can be shifted down by modifying the policy landscape, reducing demand for reserves.

With appropriate regulatory and implementation adjustments, ample—or even abundant—reserves could support a *smaller* balance sheet than the upper bound of the pre-adjustment scarce reserves regime. Indeed, it ought to be quite possible to meaningfully shrink the balance sheet while maintaining an ample reserves framework. At the same time, in the event that scarce ends up being not so far away after all, even a return to scarce reserves may require significant deregulatory actions to facilitate that transition.

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[23]See Anderson, Na, Schlusche and Senyuz (2022) for a discussion of what it means for the Fed to be operating with an unrealized loss.

[24]Operating profits may also be smaller by shifting SOMA holdings toward T-Bills, which is another proposal for reducing exposure to losses (see Waller (2025) and Sengupta and Smith (2024)).

Ample is a range. Separately, within the boundaries of ample, there is a range of feasible reserves levels. The balance sheet could also be reduced further within the ample reserves framework if the Fed were willing to operate at "less ample" levels within that range. On that note, scarce reserves also exists within a range. In other words, the relationship between reserve regimes and balance sheet size is far more flexible than commonly assumed.

To repeat, we are not advocating for or against a return to scarce reserves. We are instead challenging the widespread assumption that further balance sheet reduction requires a return to scarcity. Either regime could support a smaller balance sheet based on the changes in policy we analyze in this study.

3.3 How Far to Shrink the Balance Sheet?

In a post-GFC world where the Dodd-Frank Act and post-GFC Basel standards govern the regulatory framework, as a practical matter it is unlikely that the Federal Reserve will be able to return to a balance sheet that is 6% of GDP.[25] To satisfy the regulatory demands that respond to the Basel standards and Dodd-Frank, reserves will have to be more plentiful than they were before the GFC.

The optimal level of the balance sheet conditional on Dodd-Frank and Basel being in place is a complex and important question that will appropriately be studied for years. However, two possible benchmarks come to mind:

2009 benchmark. First, right after the first instance of quantitative easing in 2009, the balance sheet was about 15% of GDP. Possibly, this reflects a level of balance sheet that was needed to accommodate the liquidity requirements of the financial sector before QE2 and subsequent large-scale asset purchases that were performed largely for dual mandate rather than financial stability purposes.

2012/2019 benchmark. Second, both in 2012 before the start of open-ended quantitative easing, and in 2019 after the Fed stopped shedding securities but before the pandemic, the balance sheet stood at roughly 17.5% of GDP. This number could reflect the liquidity needs of the banking sector after the scope of Dodd-Frank requirements had become clear, but would also include some of the "ratchet effects" due to earlier balance sheet expansions (Acharya, Chauhan, Rajan and Steffen, 2022).

It's not clear that either of these is the optimal level of the balance sheet, but they may prove to be useful benchmarks, and either is a meaningful decline from current balance sheet levels near 21% of GDP. Moreover, scaling the balance sheet by GDP may not be the right approach; it may be more appropriate to scale it by bank deposits or other measures. Debate over the optimal size of the balance sheet will be a fruitful subject for future research, and it is not our ambition to settle it in this paper.

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[25]Indeed, currency liabilities alone exceed this level at present.

4 Options for Reducing the Balance Sheet

The following subsections lay out a myriad of options for reducing the Fed's balance sheet. Most of them are related to reducing equilibrium reserve demand. We discuss reducing regulatory reserve demand, enhancing dealer capacity for repo, reducing supervisory demand, decreasing the profitability of holding reserves, increasing the attractiveness of substitutes for reserves, and decreasing precautionary reserve demand. Finally, we discuss several options for reducing non-reserve liabilities.

4.1 Options for Reducing Equilibrium Reserve Demand

4.1.1 Regulatory Changes

Regulatory requirements are a key driver of banks' demand for reserve balances and can play a crucial role in determining the minimum size of the Federal Reserve's balance sheet. Many of the most binding regulations were established in the immediate aftermath of the GFC, at a time when bank resolution frameworks were still being developed and memories of systemic failure were fresh. The fundamental question now is whether the right balance was struck in reducing the risk of bank failures and financial crises versus the costs of requiring banks to hold large HQLA balances rather than circulating their liquidity more broadly. With over a decade of experience and significantly more robust resolution tools currently in place, it seems sensible to reassess whether the crisis-era calibration remains appropriate.

Striking the right balance. Economists often quip that if you never miss a flight, you're arriving at the airport too early. One could apply this to banking: if there never is a bank failure, there's likely been an excessive amount of regulation. On that note, the critical questions seem to be: (1) what's the appropriate frequency of bank failures, and (2) are the right resolution tools in place to prevent individual failures from metastasizing into systemic events?

Broader considerations of changes to regulations. Any recalibration of regulatory requirements must account for impacts that extend well beyond the Fed's balance sheet size. A regulatory recalibration could affect banks' competitive position relative to non-bank lenders—particularly relevant given the explosive growth of private credit markets, which now exceed $1.5 trillion and face no comparable liquidity requirements. There are also implications for individual banks' ability to navigate stress events: overly restrictive requirements could create a "use it and lose it" dynamic where banks are reluctant to draw down buffers even when appropriate. That said, requirements that are too lax may not provide adequate buffers when stress materializes, potentially necessitating destabilizing emergency interventions.

From a financial stability perspective, while concentrating liquidity in reserves can create procyclical dynamics—with banks scrambling for reserves precisely when they're most scarce—insufficient reserve buffers can generate even more severe procyclical effects through fire sales and

credit crunches. These competing considerations highlight why calibration is so challenging: requirements must provide meaningful buffers against stress while avoiding unintended constraints that limit banks' ability to deploy liquidity when most needed.

Liquidity Coverage Ratio (LCR). The LCR is one of the more consequential drivers of reserve demand.[26] The LCR applies to banks with more than $100 billion in assets and requires them to hold an amount of High-Quality Liquid Assets (HQLA) sufficient to cover their projected net cash outflows over a 30-day stress period.[27] This requirement is typically set at 100%, though the requirement is tailored down to 85% or 70% depending on the bank's size and reliance on short-term wholesale funding.

$$\frac{\text{High-Quality Liquid Assets (HQLA)}}{\text{Projected 30-day Net Cash Outflow}} \geq 100\%, \ 85\%, \ \text{or} \ 70\%$$

As of 2025, banks subject to the LCR held $4.1 trillion in HQLA at the consolidated holding company level. The numerator—HQLA—consists primarily of reserve balances, Treasury securities, and agency MBS.[28] The denominator uses mechanical run-off rates fixed by regulation: 10% of uninsured retail deposits, 40% of certain wholesale deposits, 100% of unsecured wholesale funding maturing within 30 days, etc.

Critically, discount window borrowing capacity is not currently included in the numerator. Banks must pre-fund all projected outflows with HQLA already on the balance sheet.

Policy Option 1: Recognize Discount Window Capacity in the LCR

One option is to allow banks to count pre-positioned discount window borrowing capacity secured by non-HQLA collateral (primarily loans) toward the LCR, subject to a cap. Policymakers have recently discussed such a framework (see Bessent (2026) and Hill (2026), as well as discussion in Beckworth (2026)), with industry discussions centering on a cap equal to 20% of a bank's total HQLA. Given that LCR-subject banks currently hold approximately $4.1 trillion in HQLA, a 20% threshold would provide a theoretical maximum of $820 billion reduction in demand for reserves (Nelson, 2026b). Importantly, there is already more than double this amount in available discount window capacity (after haircuts) against loan collateral, as shown by Gorton, Ross and Ross (2025),

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[26]Rezende, Styczynski and Vojtech (2021) provide direct empirical evidence that LCR requirements causally affect demand for bank reserves. For broader discussions of the effects of liquidity regulations, see Berger and Bouwman (2009), Bai, Krishnamurthy and Weymuller (2018), Banerjee and Mio (2018), Roberts, Sarkar and Shachar (2018), Gete and Reher (2021), Macchiavelli and Pettit (2021), Gorton, Laarits and Muir (2022), Anderson and Tase (2023), Sundaresan and Xiao (2024), and Anderson and Tase (2024).

[27]While the LCR can apply at the $100 billion threshold if certain conditions are met, most banks to which the LCR applies have more than $250 billion in assets.

[28]Specifically, bank reserves and U.S. Treasuries qualify as Level 1 assets, which are counted at 100% of their value. Agency MBS generally qualify as Level 2A assets, which are subject to a 15% haircut and can comprise no more than 40% of the total HQLA pool.

meaning this proposal would not require any additional pre-positioning of collateral at the discount window.

The calibration of this cap doesn't necessarily need to be static. For example, Waxman (2025) has proposed a dynamic cap based on actual recent usage, allowing banks to count discount window capacity equal to some percent of their maximum borrowing over the preceding 12 months. A dynamic approach would theoretically incentivize regular testing, potentially every month, and normalization of the facility. Carlson and Styczynski (2025) show that pre-pledged collateral increases the likelihood of discount window use.

There are many ways such a cap could be structured that would merit further discussion if it were pursued. Other approaches might factor in a multiple based on the amount of pre-pledged collateral or some other relevant consideration. In any case, by scaling the regulatory benefit directly to a bank's demonstrated willingness or ability to utilize the discount window, such approaches would automatically adjust to market conditions while directly attacking the persistent issue of discount window stigma.

Estimated effect. While the 20% static cap yields a maximum theoretical regulatory relief of $820 billion, the actual realized reduction in aggregate reserve demand would likely be more muted. Depository institutions must still hold substantial reserve balances to satisfy intraday clearing and settlement requirements. Moreover, banks do not meet their LCR HQLA requirement strictly with reserves (reserves make up roughly a third of their total HQLA). Therefore, we center our estimate around a third of the $820 billion in potential relief. Given these facts along with the uncertainty and potential binding constraints of other regulations that may go unchanged:

   - Estimated reduction in reserve demand is $50 billion to $450 billion.

Comparison to Other Studies.   The estimated reduction listed above aligns closely with previous studies. Nicolae (2020) estimates the LCR's introduction shifted U.S. reserve demand outward by 1.5% of GDP, translating to roughly $500 billion today. Similarly, Kedan and Ventula Vidal (2021) found the LCR increased Eurozone reserve demand by €200 billion—about 10% of the European Central Bank's balance sheet at the time. Scaling this 10% impact to today's Fed balance sheet implies a roughly $600 billion decline, consistent with our estimates.

Policy Option 2: Recalibrate LCR Requirements During Stress Periods

Another option is to recalibrate the minimum LCR threshold during stress periods to explicitly signal to bank management and market participants that liquidity buffers are designed to be drawn down when needed. The current LCR framework requires banks to hold enough High-Quality Liquid Assets (HQLA) to cover 30 days of projected outflows while maintaining a ratio above 100%. However, because breaching this 100% floor triggers immediate supervisory scrutiny and

intense market stigma, the required liquidity effectively becomes trapped.

Unusable buffer. In practice, banks hold substantial management buffers—often targeting an LCR of 115% to 120%——in part to ensure they never approach the regulatory minimum. As highlighted by Macchiavelli (2026), this creates an "upside-down world" of liquidity regulation. Because the LCR is an unusable buffer, banks experiencing a stress event are perversely incentivized to fire-sell illiquid assets or hoard cash to keep their LCR artificially elevated, thereby exacerbating the exact financial fragility the rule was intended to prevent.[29]

Dynamically adjusting the LCR threshold lower during stress periods, including, for example by allowing consideration of discount window access during such periods, could incentivize banks to use their High-Quality Liquid Assets (HQLA) to meet outflows rather than hold them to avoid triggering regulatory scrutiny. To quantify the potential impact of destigmatizing LCR buffers, we can establish a baseline using the approximately $4.1 trillion in HQLA currently held by LCR-subject banks. Assuming an aggregate average LCR of 118%, the implied Net Cash Outflows (NCO) for these institutions sit at roughly $3.47 trillion, which translates to a management "stigma buffer" of approximately $630 billion held strictly above the 100% regulatory floor.

Estimated effect. If regulators implement a stress-period adjustment that successfully encourages bank treasurers to optimize their balance sheets and lower their internal LCR targets by 10 percentage points (for example, from 118% to 108%), it would free up roughly $350 billion in HQLA. Given that reserves make up roughly a third of HQLA along with the uncertainty and potential binding constraints of other regulations that may go unchanged:

- *Estimated reduction in reserve demand is $50 billion to $200 billion.*

Interaction with Net Stable Funding Ratio. Note that for both policy options 1 and 2, simply changing the LCR could cause the Net Stable Funding Ratio (NSFR) to become the binding constraint. The NSFR requires banks to maintain a stable funding profile in relation to their assets and off-balance sheet activities over a one-year horizon, mathematically expressed as:

$$\frac{\text{Available Stable Funding (ASF)}}{\text{Required Stable Funding (RSF)}} \geq 100\%$$

Reserve balances receive 0% RSF treatment (they require no stable funding) while loans require 65-85% RSF. If banks shift their asset mix from reserves to loans to establish discount window capacity, their NSFR denominator increases, which pushes their NSFR downward.[30] To prevent the

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[29]The analysis in Macchiavelli (2026) indicates that it is better to be liquid than solvent, if you cannot be both.

[30]Under the U.S. implementation of the NSFR, the Available Stable Funding (ASF) numerator applies standardized weights reflecting the presumed stability of a bank's liabilities over a one-year horizon. Regulatory capital and long-term debt (maturing in >1 year) receive a 100% ASF factor; stable (fully insured) retail deposits receive 95%; less stable retail deposits receive 90%; and short-term unsecured wholesale funding from non-financial sector counterparties generally receives 50%. Crucially, short-term funding from financial sector entities or central banks—including

NSFR from simply replacing the LCR as the binding constraint, regulators would need to adjust the NSFR as well, potentially by using the same approaches that were applied to the LCR.

Policy Option 3: Reform ILST Expectations to Recognize Discount Window Capacity and Other Public Sector Liquidity Sources

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Although the LCR sets the public baseline for liquidity requirements, Internal Liquidity Stress Tests (ILSTs) are frequently cited as the primary binding constraint dictating day-to-day cash management. Under the ILST framework, banks are required to demonstrate sufficient liquidity to meet projected cash needs across overnight, 30-day, 90-day, and one-year horizons under various idiosyncratic stress scenarios (in contrast to the LCR's single 30-day horizon).

According to a recent BPI survey, bank treasurers explicitly identified ILST passage as the second-most important driver of reserve holdings (Nelson, Bristow and Waxman, 2026). They indicated that formally recognizing discount window capacity in ILSTs would significantly reduce their required reserve balances. To prevent LCR relief from remaining purely cosmetic, regulators could allow banks to explicitly project cash inflows from discount window borrowing against pre-positioned collateral in their internal overnight and 30-day stress scenarios, rather than limiting this recognition to 90-day and one-year horizons. They could also be clear that intraday credit is a viable source of funding during the 30-day horizon. They could also recognize public monetization channels as a viable means for firms to demonstrate their ability to monetize liquid assets.

Shorter horizons dictate larger reserve buffer. Modifying the ILST framework would likely unlock reductions in reserve demand above and beyond LCR adjustments because internal models dictate a fundamentally larger baseline reserve buffer. Since these models often force banks to survive severe, immediate overnight shocks rather than a smoothed 30-day average, they generate an acute preference for immediately monetizable assets, such as bank reserves. Easing this specific short-horizon constraint could realistically contribute an additional 5% to 10% reduction in reserve demand among the largest banks, equating to roughly $50 billion to $100 billion.

Category IV banks. Furthermore, ILST reform uniquely affects large regional banks (Category IV institutions with assets between $100 billion and $250 billion). These institutions are largely exempt from the LCR. Extending ILST relief to this cohort—which holds roughly $300 billion to $450 billion in aggregate reserves but lacks the massive intraday clearing constraints of the Global Systemically Important Banks (G-SIBs)—could structurally reduce reserve demand by an additional $50 billion to $100 billion.

- *Estimated reduction in reserve demand from ILST reform (above and beyond*

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standard discount window borrowing with a maturity of less than six months—receives a 0% ASF factor, thereby adding no capacity to the numerator. See Covas and Nelson (2016) for a useful overview of the NSFR.

LCR changes): $50 billion to $200 billion.

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Policy Option 4: Revise Resolution Liquidity Requirements

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Under the Single Point of Entry (SPOE) resolution strategy, Global Systemically Important Banks (G-SIBs) must maintain sufficient liquidity to allow their material operating subsidiaries to continue to operate following the parent company's bankruptcy. These resources must be balanced between being prepositioned at the subsidiary and held by the parent. However, because excess resources at subsidiaries cannot be used to offset needs at other subsidiaries, this structure fundamentally limits centralized cash management, trapping significant levels of excess reserves at the subsidiary level.

Few days of discount window access. A further antagonist to this trapped cash is the Resolution Liquidity Execution Need (RLEN) assumption set forth in resolution plan guidance that a successfully recapitalized subsidiary would lose discount window access after only a "few days." It seems difficult to rationalize why the Federal Reserve would cut off a solvent, adequately capitalized entity—an operational friction extensively highlighted by Nelson (2023). Regulators could revise RLEN to assume extended, gradually declining discount window access against pre-positioned collateral. A realistic runway might assume full access for days 1–30 post-resolution, declining to 75% capacity for days 31–60, 50% for days 61–90, and requiring full market funding thereafter.

Implementing this 90-day runway could yield a highly targeted reduction in aggregate reserve demand among G-SIBs. By allowing these institutions to substitute centralized, pre-positioned loan collateral for the physical cash currently trapped at the subsidiary level, this reform could unlock up to an additional 5 percent in reserve capacity, depending to what extent this is actually a binding constraint for banks. Because resolution requirements are distinct "gone-concern" metrics, this relief could be additive to "going-concern" reforms for the LCR and ILST.

> *- Estimated reduction in reserve demand from RLEN reform: $0 billion to $100 billion.*

Enhance dealer capacity. The late 2025 episode highlighted that repo market capacity constraints may have prevented further balance sheet reduction. This diagnosis suggests a targeted set of interventions focused on expanding dealers' ability to intermediate in Treasury cash and repo markets. By increasing dealer balance sheet capacity, the private sector could absorb more Treasury securities as they roll off the Fed's balance sheet, potentially enabling further quantitative tightening without triggering destabilizing repo rate volatility.

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Policy Option 5: SLR Relief for Dealer Intermediation

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The Supplementary Leverage Ratio (SLR) requires bank holding companies to hold capital against all assets, including low-risk Treasury securities. This constraint binds particularly tightly for dealer subsidiaries during periods of elevated Treasury supply, limiting their ability to warehouse securities and provide market liquidity. Alleviating this constraint increases dealers' and banks' capacity to hold Treasury securities and intermediate in the repo market, which would enhance the smooth absorption by the private market of securities the Fed is no longer holding.

One policy option would exempt Treasury securities from SLR calculations for bank holding companies and their dealer affiliates—similar to a temporary measure successfully implemented during the pandemic for both Treasuries and reserves. Similar relief could extend to the enhanced SLR (eSLR) that applies to Global Systemically Important Banks (G-SIBs). That said, the banking agencies' recent amendments to the leverage requirements significantly reduced the likelihood that they will bind in the near term. However, over time, if these constraints were to become more binding, this policy would eventually have a larger effect.

Summing up regulatory effects. To aggregate, we use Monte Carlo simulations to estimate an upper and lower bound of the regulatory effects based on a 95% confidence interval. Our estimates imply that this combination of regulatory reforms could yield a $200 billion to $900 billion reduction in structural reserve demand, centering on a midpoint of roughly $550 billion. Naively summing up the minima and maxima would entail a range of $150 billion to $950 billion. It is crucial to note, however, that these estimates are subject to considerable uncertainty due to the interactive nature of liquidity regulations. Because these frameworks act somewhat as a series of overlapping constraints, failing to adopt the full suite of proposed policy options could severely limit the aggregate impact, as any unchanged rules would likely become the constraint that binds.

4.1.2 Supervisory Changes

Supervision, or the ways in which regulations are enforced, can also affect reserve demand behavior. In this subsection we explore various pathways it does so.

Policy Option 6: Equalize Supervisory Treatment of Treasury Bills and Reserves.

A critical, yet often uncodified, driver of outsized reserve demand is the informal supervisory preference for reserves. In practice, banks sometimes perceive examiners as discounting the utility of other Level 1 liquid assets—such as Treasury bills—in favor of bank reserves (see Nelson (2022)). This potential bias reflects a persistent skepticism regarding the friction of monetizing securities during severe stress and differences in settlement speed, alongside a lack of institutional comfort with the discount window as a backstop facility and the Federal Home Loan Banks (FHLBs) as reliable contingent funding sources.

This approach not only reduces balance sheet efficiency but undermines the very contingency funding infrastructure designed to support the banking system. To resolve this, regulators could explicitly instruct examination teams to treat Treasury bills and reserves strictly on par in all internal and supervisory liquidity stress exercises, granting bank treasurers the flexibility to optimize their portfolios without fear of examiner penalization.

Quantifying the exact cost of uncodified practices is inherently difficult. Assuming bank treasurers hold even a marginal 1 to 2 percent management buffer specifically to appease examiner preferences for reserves over Treasuries, this change could unlock a nontrivial amount of aggregate reserve demand.

- *Estimated reduction in reserve demand from supervisory equalization reform: $25 billion to $50 billion.*

4.1.3 Decrease Profitability of Holding Reserves

Policy Option 7: Conducting Policy with EFFR Above IORB

Currently, banks have little incentive to lend in the unsecured interbank market because the Effective Federal Funds Rate (EFFR) remains below the Interest on Reserve Balances (IORB) rate. Banks maximize returns by borrowing in fed funds and other wholesale funding markets and then parking reserves at the Federal Reserve to earn IORB. If EFFR exceeded IORB, banks would reduce their reserve demand and the interbank market would likely revive. Interbank trading is currently less than 10% of the fed funds market and typically occurs at rates above IORB.

Foreign bank arbitrage. A portion of reserve demand stems from an arbitrage exploited primarily by foreign banking organizations (FBOs), which borrow at EFFR and lend to the Federal Reserve at IORB, capturing a risk-free spread of several basis points.[31] Some consider this tantamount to subsidization of foreign banks with U.S. taxpayer funds: the Federal Reserve pays above-market rates for reserves that FBOs source from the wholesale market. Conducting policy with EFFR above IORB would eliminate this arbitrage and reduce associated reserve demand.[32]

To quantify how much reserve demand might decline if EFFR were to exceed IORB, we can look to the structural reserve demand framework developed by Lopez-Salido and Vissing-Jorgensen (2025).[33] They derive reserve demand from a bank optimization problem where the marginal benefit of holding reserves equals IORB plus a convenience yield, net of marginal balance sheet costs. This convenience yield is modeled as a function of both the aggregate level of reserves and

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[31]See Anderson, Du and Schlusche (2025) and Banegas and Tase (2020) for in-depth analyses of IORB arbitrage and the role of foreign banks.

[32]An alternative way of addressing FBO arbitrage of the spread between EFFR and IORB is simply to stop paying IORB on reserves held by FBOs. This would induce substitution away from reserves and toward Treasury bills on behalf of foreign banks. It is unclear whether such a change can be implemented under current law.

[33]See Afonso, Giannone, La Spada and Williams (2022), Lagos and Navarro (2023), and Lagos and Navarro (2026) for additional approaches for estimating reserve demand.

the aggregate level of liquid deposits (which dictate banks' liquidity management and regulatory needs). The bank's first-order condition for borrowing in the federal funds market yields the following theoretical relationship:

$$EFFR = IORB + vR(Reserves, Liquid\ Deposits) - \varphi$$

Where vR represents the marginal liquidity and regulatory value of reserves, and φ represents the marginal balance sheet cost.

Empirical estimate of demand. To estimate this empirically, the authors assume a semi-log functional form and account for the lower bound imposed by the Overnight Reverse Repurchase (ON RRP) facility. Their baseline estimation models the EFFR-IORB spread as:

$$EFFR - IORB = \max\big(B + C\ln(Reserves + ON\ RRP) +$$
$$D\ \ln(Liquid\ Deposits),\ ON\ RRP\ rate - IORB + A\big) + U$$

Using weekly data through March 2025, their estimations confirm that reserve demand is highly sensitive to the EFFR-IORB spread and shifts outward as liquid deposits grow. Figure 6 panel (a) shows a robust negative relationship between the spread and reserves, which is strongly confirmed by the regressions.

Updating the estimates. Fortunately, all the underlying inputs for this specification are publicly available, allowing us to update the estimation through the present day. Figure 6 panel (b) plots these latest estimates. Compared to the curve estimated a year ago, the updated reserve demand curve has shifted further to the right with the slope little changed. The rightward shift is highly intuitive, reflecting the continued structural increase in banks' baseline demand for reserves driven by the persistent growth in liquid deposits. Meanwhile, the stability of the slope confirms that the recent upward pressure on the EFFR-IORB spread driven by declining aggregate reserves is broadly consistent with the historical elasticity estimates.

Estimated effect. The estimates show that the level of reserves consistent with an EFFR-IORB spread of 2 basis points is $2.65 trillion, or about a $350 billion decline.[34] That said, the confidence bands are large. The potential decline ranges from $150 billion to $550 billion.[35]

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[34] 2 basis points was chosen since the EFFR-IORB spread was just above this level in mid-September 2019 when there was significant stress in money markets. A larger spread would likely allow for even more reduction in reserve demand. Having an EFFR-IORB spread above zero will likely lead to more volatility in money markets. However, tools put in place since September 2019, such as the SRP, as well as implementing some of the proposals herein would likely greatly reduce the probability of an extreme event such as that of mid-September 2019.

[35] Ample reserves is a range around IORB, since markets naturally fluctuate with flows and prices rarely stay absolutely still. EFFR trading 2 basis points above IORB does not imply a return to scarce reserves, since that is still close enough to be considered ample. EFFR trading meaningfully further away from IORB would.
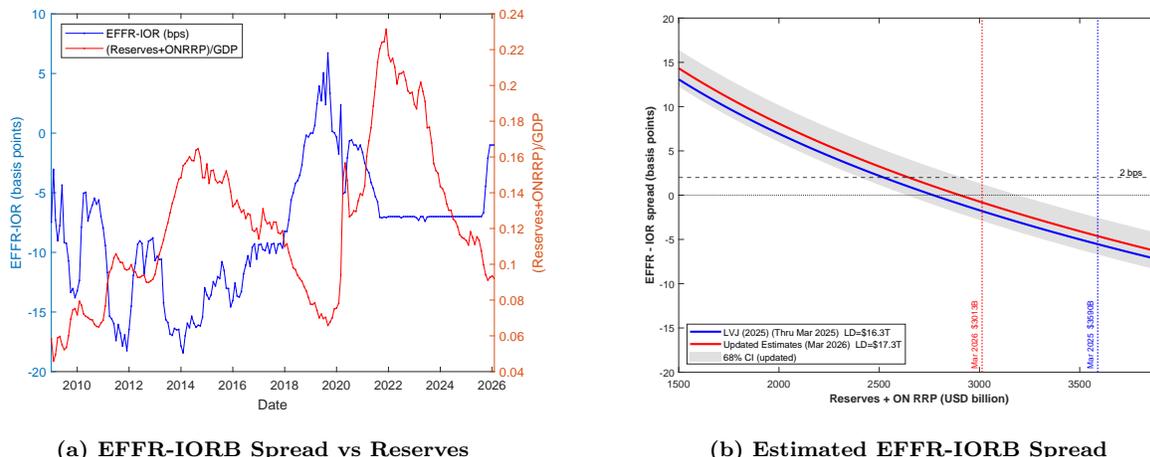
(a) EFFR-IORB Spread vs Reserves

(b) Estimated EFFR-IORB Spread

Figure 6: **Spreads, Reserves, and Reserve Demand Curves**

Note: Panel (a) shows the EFFR-IORB spread (blue) in basis points from 2009 to 2026 and reserves divided by GDP (red). Panel (b) shows estimates of the reserve demand curves based on Lopez-Salido and Vissing-Jorgensen (2025) (blue) along with our updates of their estimates (red). Source: Federal Reserve Bank of St. Louis FRED: EFFR, IORB, IOER, WRESBAL, WREPODEL, GDP

> *- Estimated reduction in reserve demand from conducting policy with a 2 bps EFFR-IORB spread: \$150 billion to \$550 billion.*

Of course, such a policy would likely involve further increases in the volatility of money markets, such as repo. This greater volatility could potentially offset some of the declines in reserve demand, instead pushing up demand due to precautionary motives. In a later section, we will highlight some operational policies—such as temporary open market operations (TOMOs) and changes to the SRP—that could mitigate this friction and support the transition. Nonetheless, a major conclusion of this portion of the analysis is that even if none of the other policy options are adopted, the balance sheet can be meaningfully reduced if one allows a tolerance for higher overnight rates with more volatility.

Policy Option 8: Tiering Reserves

The Federal Reserve could replace its flat Interest on Reserve Balances (IORB) rate with a tiered schedule that penalizes excess reserves with a lower yield.[36] Provided the spread offsets the frictional costs of lending, tiering discourages liquidity hoarding and pushes reserve-rich banks to lend to constrained peers. As demonstrated in Norway, this framework can effectively stimulate interbank trading and enable the banking system to operate efficiently with lower aggregate reserve levels without sacrificing interest rate control (see Boucinha et al. (2022) for more discussion).

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[36]Duffie (2026) provides an excellent overview of this policy option.

A number of complexities. Despite its theoretical appeal, transitioning to a tiered remuneration system would introduce severe operational and structural complexities. First, determining exactly how to set the high-tier quotas for each type of bank is fraught with challenges. Banks would inevitably lobby for higher, customized thresholds, arguing that their specific business models or risk profiles necessitate larger protected reserve buffers.

Second, tiering could fundamentally alter the mechanics of interest rate control. If excess reserves are remunerated at a substantially lower penalty rate, the Effective Federal Funds Rate (EFFR) might clear much lower than it does today, potentially requiring the FOMC to completely redefine its target range or alter its target or how it communicates its policy stance.

Finally, tiering creates cascading complications across the Fed's other liability facilities, such as the Overnight Reverse Repurchase (ON RRP) facility and the foreign reverse repo pool. If the Fed tiers reserve remuneration for commercial banks but leaves a flat, untiered rate for money market funds at the ON RRP, it risks triggering massive arbitrage opportunities and shifting liquidity away from the banking sector. Deciding whether and how to tier these parallel facilities could add a daunting layer of institutional friction to an already challenging implementation. That said, the Fed's current system of administered rates already offers different rates to different types of financial institutions, while still maintaining adequate rate control.

4.1.4 Increase Attractiveness of Substitutes for Reserves

Another way of reducing aggregate reserve demand is to enhance the attractiveness of close substitutes for reserves, inducing substitution by reserve holders into other assets.

Policy Option 9: Expand Access to FIMA repo facility

On the international front, the Federal Reserve could significantly expand the Foreign and International Monetary Authorities (FIMA) repo facility. Access could be broadened beyond traditional central banks to include sovereign wealth funds and a flexibly defined set of quasi-sovereign or public entities.

To make the facility more practically useful, the Fed could extend the operation term to 84 days and boost counterparty limits, while simultaneously implementing higher collateral haircuts to ensure strict credit and taxpayer protection. By guaranteeing that longer-duration Treasuries can be instantly converted to reserves in times of stress, this expansion could prevent disruptive fire sales. A side effect of improving the convenience yield of long-duration Treasuries could incentivize holders of massive global capital pools to increase their allocations, structurally reinforcing U.S. dollar dominance and U.S. reserve currency status. Making Treasuries more liquid will make them more attractive assets.

Another benefit of expanding FIMA could involve reducing foreign repo pool usage (see Alquist, Kahn and Stedman (2025)). On the other hand, such a change may induce a larger Fed balance

sheet during stress periods since there will be more uptake of these facilities.

Policy Option 10: Address FBO Reserve Demand with Swap Lines and Foreign Regulator Coordination

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Policy coordination may be required to address the precautionary demand for reserves by Foreign Banking Organizations (FBOs). U.S. authorities could work closely with foreign regulators to align supervisory expectations, explicitly incentivizing FBOs to rely on Treasury bills rather than Fed reserves for their liquidity buffers. Because FBO precautionary reserve demand is largely driven by a fear of losing access to dollar funding during crisis events, policymakers could alleviate this anxiety directly.[37]

The Federal Reserve could publicly and unequivocally commit to the permanence and longevity of the central bank liquidity swap lines. Reassuring foreign institutions that emergency dollar liquidity will be readily available when needed reduces their structural incentive to demand reserves during normal market conditions. Given that foreign banks hold close to $1 trillion in reserves, the above policies could potentially reduce reserve demand by up to 20%.[38]

- Estimated effect of the above policy options: $25 billion to $200 billion

4.1.5 Decrease Precautionary Reserve Holdings

As previously mentioned, banks hold reserves for precautionary reasons, self-insuring against states of the world in which their reserves fall below required levels. Precautionary holdings can be affected by changing the frequency or severity of shocks to reserve supply or demand.

Smoothing Predictable Volatility with TOMOs. Targeted temporary open market operations (TOMOs) could smooth predictable repo rate spikes around high-pressure days, reducing both market stress and the need for banks to hoard precautionary cash.[39] This would likely only be necessary if SRPs were not regularly used as intended.

SRP Enhancements. The SRP provides a natural ceiling for repo rates by allowing eligible counterparties to borrow reserves against Treasury and agency securities collateral. Andolfatto and Ihrig (2019) document that this can reduce demand for reserves. However, operational constraints and persistent stigma limit its effectiveness.

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[37]FBOs also hold significant reserves due to IORB arbitrage. Anderson, Du and Schlusche (2025) show that FBOs reduce reserves in response to a wholesale funding shock, suggesting that these reserves are held for arbitrage rather than as a liquidity buffer. Policy Option 7 of conducting policy with EFFR above IORB would reduce this demand.

[38]This estimated reserve reduction amount is not the same necessarily as the US Treasury increase that would occur. US Treasuries holdings may increase by more than reserves are reduced.

[39]Relatedly, some of the regulatory policy options above would reduce window dressing and therefore ameliorate the rate pressures seen on these days as well so there would be less volatility for the Fed to smooth via TOMOs.

Policy Option 11 (a): Using Communication to Reduce Stigma of SRP

Perhaps most importantly, clear communication from the Federal Reserve that the SRP represents a routine liquidity tool—rather than an emergency lifeline—is essential to reduce stigma and improve transmission to broader repo markets. The December 2025 changes—changing the name from "standing repo facility" to "standing repo operations" and removing the aggregate cap—went a step in this direction, but more could be done. This public messaging should be directly reinforced by supervisory guidance, making it clear that regulators and examiners view regular SRP borrowing as a sign of healthy, active liquidity management.

Reducing stigma of other Fed facilities. Relatedly, as discussed above, the discount window and daylight overdrafts are also subject to stigma. While the Fed took some steps in 2020 to reduce the stigma of the discount window, continued communications and improvements could further encourage routine use of these facilities for liquidity management. Other policies listed here, such as including borrowing capacity from Fed liquidity facilities in the LCR and ILST, may also help with reducing the stigma.

Policy Option 11 (b): Extending the SRP Borrowing Window and Central Clearing

Extending the SRP borrowing window to permit more frequent access would allow dealers to manage unexpected intraday volatility more flexibly. Central clearing of SRP transactions would enable dealers to net these borrowings against other positions, effectively expanding intermediation capacity without increasing gross balance sheet footprints. Although central clearing has downsides, such as introducing a single point of failure, this could be mitigated by requiring multiple clearinghouses.

While the precise impact is difficult to model, the late October 2025 episode—where dealers drew just $50 billion from the SRP despite $750 billion clearing above its rate—highlights the cost of trapped intermediation capacity. Following the December 2025 changes, SRP usage at the 2025 year-end reached $75 billion and repo rate pressures were lower, suggesting some improvement. Destigmatizing the SRP would unlock this capacity, allowing the Fed to rely on an elastic market backstop rather than a massive static reserve buffer to absorb liquidity shocks.

Policy Option 12: Sterilize TGA Fluctuations with T-Bills

Another driver of precautionary reserve demand is fluctuations in reserves due to the Treasury General Account (TGA). The TGA can vary significantly, especially during debt limit episodes and tax season. In recent periods, the TGA typically has been around $800 billion with peaks of up to

$1 trillion. All else equal, an increase in the TGA leads to a corresponding decrease in reserves. To reduce or eliminate these fluctuations, the Fed could back the TGA by Treasury bills, an approach explored by Vissing-Jorgensen (2025) and Vissing-Jorgensen (2026). She estimates that backing the full TGA with Treasury bills could reduce precautionary reserve demand by approximately $400 billion based on post-pandemic dynamics.

We also employ an alternative methodology that isolates the effect of TGA volatility. Specifically, we extend the EFFR-IORB spread regression framework of Lopez-Salido and Vissing-Jorgensen (2025) by incorporating a measure of weekly realized TGA flow volatility. We find the coefficient on TGA volatility is economically meaningful and statistically significant, implying that fully stabilizing TGA fluctuations could reduce precautionary reserve demand by approximately $75 billion.

The magnitude of the effect of this policy would depend on whether the entire TGA is backed by Treasury bills, as in Vissing-Jorgensen (2026), or only fluctuations, as in our analysis. To determine our estimated range, we account for a complementary policy considered below under Policy Option 14: reducing the TGA buffer from 5 days to 2 days, which would effectively halve the TGA's size. Since sterilization benefits tend to scale with TGA size, we set our upper bound at half of Vissing-Jorgensen's $400 billion estimate ($200 billion). We set our lower bound near our $75 billion volatility-based estimate, adjusted to $50 billion to reflect implementation uncertainty. If this option is undertaken in isolation without option 14, it could yield the full $400 billion estimated by Vissing-Jorgensen.

- *Estimated effect of the above policy options: $50 billion to $200 billion*

Of course, such a policy may have countervailing implications for the relationship between the Federal Reserve and the Treasury Department that would need to be evaluated in considering this option.

Policy Option 13: Implement a Liquidity Savings Mechanism for Fedwire

As emphasized in Duffie (2026), the Federal Reserve could reduce reserve demand through an upgrade to the payment system. Augmenting Fedwire with a Liquidity Savings Mechanism (LSM) would allow banks to queue non-urgent payments.[40] Advanced algorithms would then continuously scan this queue to bilaterally or multilaterally net these outgoing transfers against incoming flows.

By systematically offsetting these transactions, an LSM enables banks to settle large volumes using only a fraction of their pre-loaded reserves. This directly mitigates the coordination failures that cause banks to defensively delay payments and hoard liquidity. Norman (2010) finds that the introduction of such a system reduced liquidity buffers by 20% in South Korea and 15% in Japan. Davey and Gray (2014) find a 20% reduction in the UK.

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[40]Destigmatizing the discount window and intraday credit might conceivably have a similar impact, but these options could be more costly for banks to pursue.

Estimated effect. According to [Alexandrova-Kabadjova et al. (2023)](#), the U.S. Fedwire system collectively used an average of $630 billion of liquidity every business day for payment obligations from 2008 to 2018. Given this level, a 15 to 20% efficiency gain could imply a meaningful decrease in bank liquidity buffers.

> - *Estimated reduction in reserve demand of upgraded payment system: $100 billion to $125 billion.*

4.2   Options for Reducing Liabilities Outside the Domestic Banking System

The Treasury General Account (TGA) at the Federal Reserve represents a meaningful portion of the Fed's balance sheet, currently accounting for around $800 billion or almost 15 percent of total liabilities. One policy option to facilitate balance sheet reduction involves reconsidering where Treasury maintains its cash balances. The question is not whether Treasury should hold substantial liquidity reserves, but rather whether all of these balances need to reside at the Federal Reserve. To be clear, these decisions would need to be taken by the Treasury Department, as they are not the Fed's to make.

Policy Option 14: Reforms to Treasury General Account (TGA) Management

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An alternative would involve shifting a portion of the TGA back to commercial banks—effectively reviving a modernized version of the historical Treasury Tax and Loan (TT&L) program (see Santoro (2012), Huther, Pettit and Wilkinson (2019), and Nelson (2019) for discussion of the TT&L). See Figure 7 for the historical size of the TGA and TT&L. This arrangement would offer several systemic benefits: the Treasury could earn a return on these deposits, banks would gain a source of funding, and the Treasury would re-establish stronger operational relationships with the banking sector. From a central banking perspective, shifting TGA balances to commercial banks would likely allow the Federal Reserve to shrink its total asset footprint and shrink the volatility of reserves. However, these additional Treasury deposits held at banks would also likely increase bank demand for reserves, so the reduction would be less than one-for-one.

The extent of this shift would require careful calibration. One approach would be to reduce the Treasury's buffer at the Fed from its current target of approximately five days of operating needs—a policy adopted in the wake of Hurricane Sandy—to a smaller two-day buffer, with the remainder placed at commercial banks. This would roughly halve the TGA at the Fed while maintaining the Treasury's overall liquidity position. Given that the reduction may not translate into a one-for-one reduction in the balance sheet due to the additional deposits at banks and associated reserve demand, we estimate a lower bound effect at half of the overall decline in the TGA.

Obviously, any decisions on this subject will ultimately be the Treasury Department's to make.
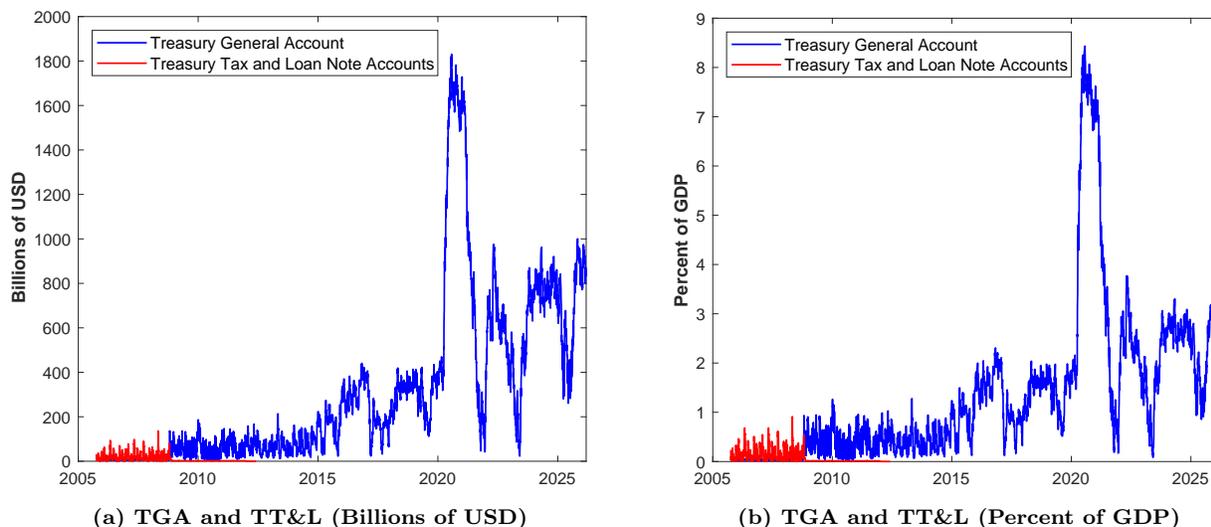
(a) TGA and TT&L (Billions of USD)   (b) TGA and TT&L (Percent of GDP)

Figure 7: **Treasury General Account and TT&L Accounts**

Note: Panel (a) shows the Treasury General Account balance (blue) and the balances in the Treasury Tax and Loan Note Accounts (red). Panel (b) shows the equivalent balances as a percent of nominal GDP. Source: U.S. Treasury, Daily Treasury Statement, Items: "Treasury General Account" (post-October, 2021), "Federal Reserve Account" (pre-October, 2021), "Tax and Loan Note Accounts (Table V)"; FRED: GDP

- Estimated reduction in balance sheet size: $200 billion to $400 billion.

However, this approach presents operational challenges for the receiving institutions. TGA balances fluctuate significantly—particularly around quarterly tax payment dates and Treasury auction settlements—creating substantial volatility in bank deposits. Banks would need to actively manage these chunky, unpredictable deposit swings, which could complicate their internal liquidity and balance sheet planning, and correspondingly increase their reserve demand.

One way to partially address this friction is for the Fed to engage in temporary open market operations (TOMOs) to sterilize TGA volatility with T-bill purchases. We discuss this specific operational mechanism in an earlier section of this paper. Alternatively, Treasury could manage that chunky volatility out of the TGA balance left with the Fed, rather than that in the refreshed TT&L banks.

Policy Option 15: Discourage Use of the Foreign Reverse Repo Pool

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Other significant liabilities on the Fed's balance sheet include the ON RRP and the foreign reverse repo (RP) pool. Both allow eligible counterparties—money funds, FHLBs, and other domestic financial institutions in the case of the ON RRP and foreign central banks in the case of the foreign reverse repo pool—to park cash at the Fed collateralized by Treasury securities. As seen in Figure 8, the ON RRP reduced from about $2 trillion to close to zero between 2022 and

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(a) Foreign Reverse Repo Pool and ON RRP

(Billions of USD)

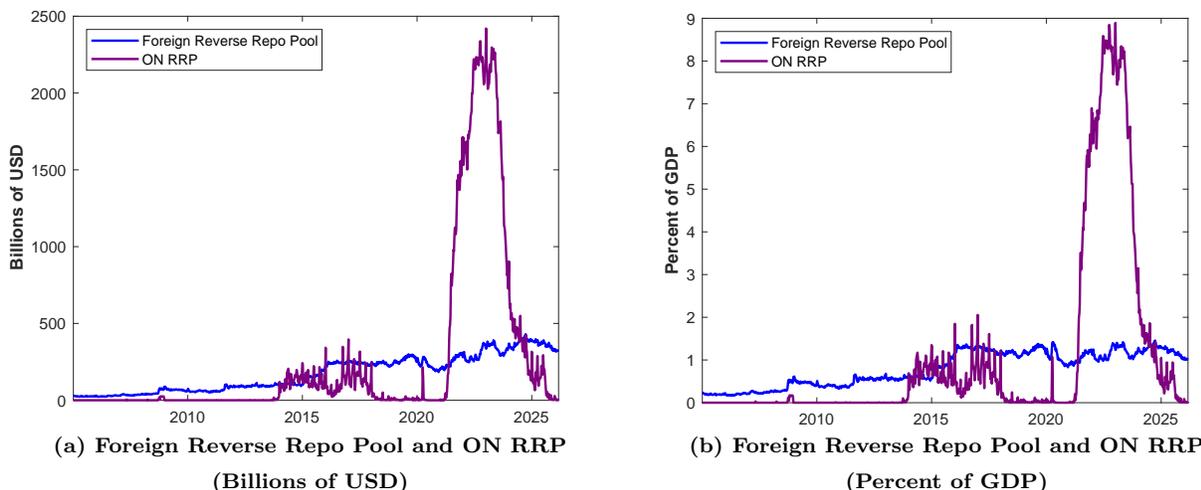**(b) Foreign Reverse Repo Pool and ON RRP**

(Percent of GDP)

Figure 8: **Foreign Reverse Repo Pool and ON RRP Balances**

Note: Panel (a) shows the foreign repo pool and ON RRP balances in billions of US dollars. Panel (b) shows the same series as percent of GDP. Source: Federal Reserve Bank of St. Louis FRED: WREPOFOR, WREPODEL, GDP.

2025 as repo rates and Treasury bill issuance increased, giving ON RRP investors more attractive alternatives.[41]

The foreign reverse repo pool, on the other hand, has remained stable at around $300 to $400 billion over the last several years (see Figure 8). Foreign central banks typically use this as a store of dollar liquidity. The Fed could discourage its use by reducing the interest rate it pays (although it is already below the ON RRP rate), capping usage, or otherwise making the pool less attractive relative to Treasury bills or other alternative investments.[42]

  - Estimated reduction in balance sheet size: $0 billion to $100 billion.

5   Adding It All Up

The preceding analysis examined 15 policy options. The table below summarizes the estimated effects, showing the minimum, midpoint, and maximum for each option. These estimates carry considerable uncertainty, which likely compounds when aggregating across policies. Moreover, these effects may not be strictly additive, as interactions between policies could either amplify or offset individual impacts.

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[41]The surge and subsequent decline in ON RRP take-up over the last several years indicates the success of the design of these operations. The ON RRP absorbed excess liquidity that banks did not want to hold when reserves were abundant. But then as the Fed shrank its balance sheet, the ON RRP naturally drained as other market investments became more attractive.

[42]Part of the increase in usage over the last decade or so was a result of Fed changes in 2015 that made the pool more attractive including reduced constraints on use. See the Federal Reserve Bank of New Yorks's 2015 OMO Report for more details https://www.newyorkfed.org/medialibrary/media/markets/omo/omo2015-pdf.pdf.

Frameworks for policy analysis. To address compounding uncertainties and policy interactions, we follow established best practices outlined in OMB Circulars A-4 and A-94, and the GAO's Cost Estimating and Assessment Guide (GAO-20-195G). These guidelines are used extensively across federal agencies to ensure analytical rigor when evaluating complex policy portfolios.[43]

These frameworks recommend formal probabilistic modeling, specifically Monte Carlo simulation, to aggregate effects. Rather than deterministically adding point estimates, this approach simulates thousands of scenarios using probability distributions to generate expected values and plausible confidence intervals. Crucially, this prevents the statistical trap of naively summing the maxima, which would imply the extreme upper bound occurs simultaneously for all of the options.[44]

Assume uniform distributions for ranges. Given the high baseline uncertainty, we assume continuous uniform distributions for each policy range, though sensitivity testing confirms the aggregated results are robust to an assumption of normality. Finally, we incorporate a degree of positive dependence (correlation) among the regulatory policies. This reflects the possibility that these policy shifts would likely occur concurrently and ensures we do not artificially understate the width of the aggregate confidence intervals.

Table 3 organizes the policy effects into two categories: policies affecting reserve demand and policies affecting other balance sheet liabilities. The first panel shows the estimated reduction in reserve demand. Based on our Monte Carlo simulations, these policies would reduce reserve demand by approximately $1.3 trillion, with a 95% confidence interval of $825 billion to $1.75 trillion. In the context of a balance sheet currently holding $3 trillion in reserves, this represents a substantial reduction. Based on the midpoint estimate, approximately $1.7 trillion in reserves would remain—still considerably elevated relative to pre-Global Financial Crisis levels, when reserves averaged under $50 billion, but more aligned with post-2020 norms when reserve demand appears structurally higher due to regulatory and operational changes.

The second panel shows the estimated effects of policies targeting non-reserve liabilities. Specifically, recalibrating the Treasury General Account management (Policy 14) and reducing use of the Foreign Repo Pool (Policy 15). Together, these policies would contribute an additional reduction of approximately $350 billion to the overall balance sheet.

Adding it all up. Combining all policies, our Monte Carlo simulations indicate a total balance sheet reduction of $1.2 to $2.1 trillion (95% confidence interval). Given the current balance sheet of $6.6 trillion (21% of GDP), this range would bring the balance sheet closer to levels observed during the 2009 (15% of GDP) and 2012/2019 (17.5% of GDP) periods that we previously mentioned. The

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[43]Specific instructions on probabilistic modeling, Monte Carlo simulations, and avoiding the naive summation of ranges can be found in OMB Circular A-4, Section 11; OMB Circular A-94, Section 9; and GAO-20-195G, Chapter 12. For an example of how these guidelines are operationalized, see Baxter, Raich and Dillon-Merrill (2021). Special thanks to Aaron Kearsley for directing us to these sources.

[44]If evaluated as independent events, the probability of all the options landing in the top 10 percent of their respective ranges is 1 in 100 billion (10^{11}), which is why we do not focus on the naïve sums.

	Policy Options	Min	Mid	Max
1	**Recognize Discount Window Capacity in the LCR**	50	250	450
2	**Recalibrate LCR Requirements During Stress Periods**	50	125	200
3	**Reform ILST Expectations to Recognize DW Capacity**	50	125	200
4	**Revise Resolution Liquidity Requirements**	0	50	100
5	**SLR Relief for Dealer Intermediation**	–	–	–
6	**Equalize Supervisory Treatment of Treasury Bills and Reserves**	25	38	50
7	**Conducting Policy with EFFR Above IORB**	150	350	550
8	**Tiering Reserves**	–	–	–
9	**Expand Access to FIMA Repo Facility**	25	112	200
10	**Address FBO Reserve Demand w Swap Lines, Foreign Reg. Coord.**	–	–	–
11a	**Using Communication to Reduce Stigma of SRP**	–	–	–
11b	**Extending the SRP Borrowing Window and Central Clearing**	–	–	–
12	**Sterilize TGA Fluctuations with T-Bills**	50	125	200
13	**Implement a Liquidity Savings Mechanism for Fedwire**	100	112	125
	Total Reduction in Reserve Demand (Naïve Sum)	*500*	*1287*	*2075*
	Total Reduction in Reserve Demand (Monte Carlo Simulation Based)	**825**	**1287**	**1750**
14	**Recalibrate Treasury General Account (TGA) Management**	200	300	400
15	**Discourage Use of the Foreign Reverse Repo Pool**	0	50	100
	Total Estimated Reduction of Balance Sheet (Naïve Sum)	*700*	*1637*	*2575*
	Total Estimated Reduction of Balance Sheet (Monte Carlo Simulation Based)	**1150**	**1637**	**2125**

Table 3: **Policy Options and Estimated Effects**

Note: Estimates are in billions of dollars. Options with no numerical estimates reflect combinations with other options or were unable to be estimated with sufficient precision. The totals are computed based on Monte Carlo simulations of 1,000,000 draws and follow the standards set forth by OMB Circular A-4. The minimum of the totals reflects the 2.5[th] percentile and the maximum of the totals reflects the 97.5[th] percentile.

midpoint of our estimated range, around \$1.65 trillion, would position the balance sheet at 16% of GDP, within the 15-17.5% of GDP range observed during those periods.

It is important to note that these ranges reflect the capacity to reduce the balance sheet by shifting down the range that characterizes ample reserves; further reductions would be possible with a return to scarce reserves.

6 Making Sure the Financial System Can Absorb Securities the Fed Sheds

If securities mature off the Fed's balance sheet and are reissued, the public will have to absorb the reissues. Therefore, it makes sense to take additional steps to make it easier for the public to absorb securities shed from the Fed's balance sheet.

First, it will be important for the Fed to go slowly. The most obvious thing to do is not overwhelm the market with more securities than it can absorb in a short period of time. That means not going materially faster than previous rates of balance sheet reduction, and also avoiding asset sales as opposed to allowing maturing securities to roll off. Going slowly may also increase the likelihood that banks feel comfortable operating with lower levels of reserves which would in turn allow greater reductions in reserve supply.

Second, there are regulatory constraints that can be eased to expand the volume of Treasury securities banks can hold. Changes to the G-SIB surcharge to better accommodate Treasury securities and repo transactions that are secured by them could allow greater engagement by the largest banks. In addition, Miran (2025) proposed removing Treasury securities from the denominator in calculations of the supplementary leverage ratio and the enhanced supplementary leverage ratio, actions that would allow banks to absorb additional Treasuries with reduced regulatory or balance sheet cost. That said, the banking agencies' recent amendments to the leverage requirements significantly reduced the likelihood that they will bind in the near term. Over time, if these constraints were to become more binding, this policy would eventually have a larger effect. Such an action, combined with shedding securities, would signal to markets that the Fed will not allow balance sheet reduction to cause unwanted tightening of financial conditions. Proactively removing constraints before they bind can be a powerful signal.

Third, finalizing central clearing of Treasury repo will also help. Centralized clearing allows banks to net across counterparties, which can often reduce their net exposure that must be capitalized against. Central clearing may have some drawbacks that will have to be weighed or, if possible, ameliorated. For instance, concerns that central clearing introduces a single point of failure vulnerability can be mitigated by ensuring central clearing only begins with multiple clearinghouses participating.

Fourth, some of the policy options described above will help the market absorb securities by making Treasury securities more attractive. For instance, SRP enhancements or the FIMA expansion will improve the liquidity characteristics of Treasuries for some investors, making them marginally more attractive.

Finally, Bowman (2026a) has suggested a variety of means to make it easier for banks to participate in the mortgage market. Further reforms to help banks absorb the increased mortgage risk supplied to the public could allow greater balance sheet reduction.

7 Implications for Monetary Policy

Many of these options will have consequences for the stance of monetary policy. It is difficult to analyze them without concrete details about what implementation might look like, but we will offer some general comments about interactions between bank regulations and monetary policy that may or may not apply to each specific measure. Generally speaking, bank deregulation that eases the supply of credit will result in additional credit growth. That credit growth will boost actual economic activity in the short run relative to economic potential, creating a positive output gap that, all else equal, requires tighter monetary policy to offset.

At the same time, permanently increasing the supply of credit will weigh on the so-called neutral rate of monetary policy, the rate that is neither stimulative nor accommodative. This is because the neutral rate is the outcome of equilibrium in the market for loanable funds in the long run, and steps to permanently ease credit supply will, all else equal, reduce the equilibrium interest rate on loanable funds in the long run. The net effect of these two forces is ambiguous and will depend on many other factors.

However, there are some policy options above that, unlike general bank deregulation, have unambiguous effects. For instance, expanding FIMA access is likely to make Treasury securities more attractive and draw loanable funds into the American financial system and economy. New international flows into dollar-denominated savings unambiguously imply a reduction in the neutral rate which would appropriately be offset by lower policy rates, though whether the magnitude would end up being meaningful is an open question.

Moreover, the course of balance sheet reduction may itself have implications for the stance of monetary policy as the money supply shrinks and the amount of duration risk that has to be absorbed by the public increases. All else equal, balance sheet reduction tightens the stance of monetary policy and, so long as the fed funds rate is not constrained by the zero lower bound, warrants lower policy rates to offset. However, these implications will depend on which—if any—steps outlined in this paper are taken, and their magnitude will depend on the speed at which the Fed's balance sheet declines.[45]

8 Conclusion

There are a variety of means for further reducing the Fed's balance sheet. If reserve demand and not just supply can be affected by policy choices, then those choices can open the door to a smaller Federal Reserve footprint. If it so desired, the Federal Reserve could return to a scarce reserves operating framework, or it could retain an ample reserves framework while taking steps to lower

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[45]There remain many open questions about the role of the money supply in a system of administered rates. By contrast, a return to scarce reserves would restore the money supply to the center of monetary policy. Even in an environment of administered rates, some studies, such as Belongia and Ireland (2015), conclude that interest rates do not offer a full picture of the stance of monetary policy. A decline in the balance sheet may hence imply a contraction of money supply affecting the stance of monetary policy above and beyond the setting of administered rates.

the boundaries that separate ample from scarce and by operating in the lower part of the ample range, i.e. "less ample." Even a choice to return to scarce reserves will likely require some of the steps described in this paper to facilitate that transition.

A combination of steps to reduce demand for reserves, make alternatives to reserves more attractive, and increase the market's capacity to absorb securities, can yield significant reductions. Summing up the ranges we estimate, it should plausibly be possible to shrink the balance sheet by \$1.2 to \$2.1 trillion, if all these steps were ultimately implemented. These numbers reflect a reduction in the zone that characterizes ample reserves; further reductions could be accomplished by returning to scarce reserves.

While many of these policy options will allow reduction of the Fed's balance sheet, we acknowledge that they may raise the risk of greater Fed exposures as backstops are utilized during tail events. Therefore, a deeper analysis of the trade-offs implied by the given mix of policy options that might be chosen is necessary before policymakers take action.

Shrinking the balance sheet, if it is undertaken, will take time to implement. There will first have to be a great deal of research, planning, structuring and rulemaking before any commencement. The combination of such activity is likely to take at least a year and quite possibly several. And even upon commencement, there are strong reasons for going slowly so as not to overwhelm the market with more securities than it can absorb, and taking additional steps to ease the market's absorption of securities.

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Appendix

A   Data Sources

In this section, we provide the precise sources for the data in the figures.

Figure 2

Source: Federal Reserve Bank of St. Louis FRED, "Liabilities and Capital: Other Factors Draining Reserve Balances: Currency in Circulation: Week Average (WCURCIR)" , "Liabilities and Capital: Other Factors Draining Reserve Balances: Reserve Balances with Federal Reserve Banks: Week Average (WRESBAL)", "Liabilities and Capital: Liabilities: Reverse Repurchase Agreements: Others: Week Average (WREPODEL)", "Liabilities and Capital: Liabilities: Deposits with F.R. Banks, Other Than Reserve Balances: U.S. Treasury, General Account: Week Average (WTREGEN)", "Liabilities and Capital: Liabilities: Total Liabilities (Less Eliminations from Consolidation): Wednesday Level (WLTLECL)", "Gross Domestic Product (GDP)"

Figure 3

Source: Federal Reserve Bank of St. Louis FRED: "Liabilities and Capital: Other Factors Draining Reserve Balances: Reserve Balances with Federal Reserve Banks: Week Average (WRESBAL)", "Interest Rate on Required Reserves (IORR Rate) (DISCONTINUED) (IORR)", "Market Yield on U.S. Treasury Securities at 1-Month Constant Maturity, Quoted on an Investment Basis (DGS1MO)", "Market Yield on U.S. Treasury Securities at 3-Month Constant Maturity, Quoted on an Investment Basis (DGS3MO)"; Federal Reserve Board of Governors, "Peak and Average Daylight Overdrafts and Related Fees"

Figure 4

Panel (a): Source: Federal Reserve Bank of St. Louis FRED: "Effective Federal Funds Rate (EFFR)", "Interest Rate on Reserve Balances (IORB Rate) (IORB)", "Interest Rate on Excess Reserves (IOER Rate) (DISCONTINUED) (IOER)"

Panel (b): Source: Federal Reserve Bank of St. Louis FRED: "Interest Rate on Reserve Balances (IORB Rate) (IORB)", "Tri-Party General Collateral Rate (TGCRRATE)", "Interest Rate on Excess Reserves (IOER Rate) (DISCONTINUED) (IOER)

Figure 5

Panel (a): Source: Federal Reserve Bank of New York, Reserve Demand Elasticity, https://newyorkfed.org/research/reserve-demand-elasticity/. Daily data on reserves and the fed funds rate are collected by the Federal Reserve Bank of New York; the daily interest rate on reserve balances is available from FRED ("IOER" and "IORB").

Panel (b): Source: Federal Reserve Bank of St. Louis FRED: "Effective Federal Funds Rate (EFFR)", "Tri-Party General Collateral Rate (TGCRRATE)", "Interest Rate on Reserve Balances (IORB Rate) (IORB)", "Interest Rate on Excess Reserves (IOER Rate) (DISCONTINUED) (IOER)"

Panel (c): Source: Federal Reserve Bank of New York, SOFR 75th percentile from https://www.newyorkfed.org/markets/reference-rates/sofr and SRP rate from https://www.newyorkfed.org/markets/desk-operations/repo.

Figure 6

Source: Federal Reserve Bank of St. Louis FRED: "Effective Federal Funds Rate (EFFR)", "Interest Rate on Reserve Balances (IORB Rate) (IORB)", "Interest Rate on Excess Reserves (IOER Rate) (DISCONTINUED) (IOER)", "Liabilities and Capital: Other Factors Draining Reserve Balances: Reserve Balances with Federal Reserve Banks: Week Average (WRESBAL)", "Liabilities and Capital: Liabilities: Reverse Repurchase Agreements: Others: Week Average (WREPODEL)", "Gross Domestic Product (GDP)"

Figure 7

Source: U.S. Treasury, Daily Treasury Statement, Items: "Treasury General Account"(post-October, 2021), "Federal Reserve Account"(pre-October, 2021), "Tax and Loan Note Accounts (Table V)"; FRED: GDP

Figure 8

Source: Federal Reserve Bank of St. Louis FRED, "Liabilities and Capital: Liabilities: Reverse Repurchase Agreements: Foreign Official and International Accounts: Week Average (WREPOFOR)", "Liabilities and Capital: Liabilities: Reverse Repurchase Agreements: Others: Week Average (WREPODEL)", "Gross Domestic Product (GDP)"