Fluctuations in the Treasury General Account and their effect on the Fed's balance sheet

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Abstract: The US government's money demand is large and volatile and takes the form of the Treasury General Account (TGA) at the Federal Reserve. I study the drivers of TGA volatility and the options available to the Federal Reserve for adjusting its balance sheet in response to this volatility. Using interest rate control, control of the Fed's overall policy stance, and communication as criteria, I argue that a policy of adjusting the Fed's holdings of Treasury bills (or other short-maturity assets) performs better than the current ample reserves policy of letting the supply of reserves and overnight reverse repo facility balances adjust passively to changes in the TGA.

[1] Disclaimer: The views expressed herein are those of the author; they do not reflect those of the Federal Reserve Board or the Federal Reserve System. E-mail: annette.vissing-jorgensen@frb.gov. I thank Tom Barkin, Josh Gallin, Beth Hammack, Beth Klee, Lorie Logan, Julie Remache, Trevor Reeve, Jeremy Stein and conference participants at the Federal Reserve Bank of Richmond for very helpful feedback.

1. Introduction

The US government's money demand takes the form of Treasury General Account (TGA) balances which are the government's deposits held with the Federal Reserve. The TGA is used to facilitate payments to and from the government stemming from taxes, spending and debt issuance. It thus provides important payment services to the government and to the country. Over the past decade the US government's money demand has been large and volatile, with TGA balances reaching a high of $1.8T but with large swings as illustrated by the red line in Figure 1 Panel A.

From the perspective of the Federal Reserve, the TGA is a liability, and it is one component of the Fed's money supply. Supplying money is one of the Fed's core tasks, with currency supplying payment services to households and firms, reserves supplying payment services to banks, and the TGA supplying such services to the government. The Fed also has other important tasks, notably monetary policy. When the TGA fluctuates on the Fed's balance sheet, something else must change on either the asset side or the liability side. On the liability side, the Fed could let reserves or overnight reverse repo (ON RRP) balances decline when the TGA increases (and conversely). On the asset size, the Fed could increase its securities holdings or its lending to the financial sector with increases in the TGA. However, these changes could affect the Fed's monetary policy stance. For example, changes to reserves may affect the market clearing short interest rate, and changes to the Fed's holding of assets with duration or pre-payment risk will affect the market clearing longer-term interest rates. In this paper, I analyze how the Fed may best address fluctuations in the TGA given these interlinkages of its money supply and monetary policy tasks.

I propose three criteria for deciding between the various possibilities. The first is interest rate control, i.e., ensuring that short market rates clear squarely inside the target range. The second is avoiding effects of TGA fluctuations on the Fed's overall policy stance including the amount of stimulus provided via Fed holdings of assets with duration or pre-payment risk. The final criteria is how easy the policy is to communicate to the public, including whether the policy could be misperceived as the Fed reacting to fiscal policy.

In practice, since the global financial crisis, the Fed has mostly followed an "ample reserves" policy of keeping the supply of reserves plus ON RRP balances large, thereby allowing them to adjust to TGA fluctuations without resulting interest rate volatility. I argue that this approach raises challenges with respect to all three criteria. Regarding interest rate control, the challenge is that the level of reserves needed to prevent substantial interest rate volatility from emerging is not known with high precision. Therefore, an ample reserves policy faces a difficult tradeoff between risking interest rate volatility or keeping a reserve supply higher than the point estimate of what is needed. As for the Fed's overall policy stance, an ample

reserves policy can complicate quantitative tightening (QT, also called balance sheet normalization) if QT happens during a period with large TGA fluctuations. Specifically, if a debt ceiling episode implies that the TGA falls and then increases sharply once the debt ceiling is raised or suspended, then there is a risk that the Fed may overdo QT, leading to reserve scarcity and interest rate volatility. The problem is that when the TGA fluctuates, reserves plus ON RRP balance do not decline smoothly with balance sheet runoff, and may even increase temporarily despite QT. Reserve scarcity may emerge once the TGA is returned to the Treasury's target level which tends to happen fast after the debt ceiling is raised or suspended. If the Fed stops, slows or pauses QT due to a debt ceiling event, this implies that the Fed's overall policy stance is changed due to TGA fluctuations, not due to the underlying economic situation or outlook. A change to balance sheet normalization in reaction to potential TGA fluctuations also raises communication concerns because such decisions may be viewed by the public as fiscal policy affecting monetary policy, even if the effect is of a somewhat technical nature.

I argue instead that an approach of *supplying the TGA via Fed holdings of Treasury bills and adjusting these bill holdings with TGA fluctuations* would score well on the three policy design criteria. In terms of interest rate control, this policy would allow the supply of reserves plus ON RRP balances to be unaffected by TGA fluctuations, thereby lowering interest rate volatility for given average balance sheet size. As a result, the Fed could either decide to keep the same average balance sheet size as in the ample reserves approach, but with a lower expected interest rate volatility, or could lower the average balance sheet size with expected interest rate volatility the same as in the ample reserves approach. As for the overall policy stance, with the TGA backed with bills, the Fed's holdings of longer-maturity assets would be unaffected by TGA fluctuations. This would insulate the Fed's overall policy stance from the TGA. For example, there would be no need to stop, slow or pause QT during a debt ceiling episode as reserves plus ON RRP balances would decline smoothly with QT regardless of the evolution of the TGA, thereby avoiding sudden fluctuations that could lead to unintended reserve scarcity. Finally, the new approach would be easy to communicate. The Fed accommodates *trends* in money demand (for currency, the TGA, and reserves). Backing the TGA with bills and adjusting bill holdings reactively would extend this principle to also accommodate *fluctuations*, specifically those arising from the government's money demand.

Overall, the new approach to addressing TGA fluctuations would be a straightforward way for the Fed to provide banking services to the government while keeping one Fed job (being the government's bank) separate from another Fed job (monetary policy).

The paper is structured as follows. In section 2, I first review the moving parts of the Fed's balance sheet followed in section 3 by a description of the TGA and the drivers of its level and volatility. Section 4 describes possible approaches for the Fed to address TGA fluctuations and lays out policy design criteria

for evaluating them. Section 5 describes the challenges that arise with ample reserves policies and argues that a policy of backing the TGA with bills could help. Section 6 addresses implementation and section 7 concludes.

2. Components of the Federal Reserve's balance sheet and their relation to Fed mandates

By way of background, Table 1 shows the Fed's balance sheet as of August 20, 2025. Omitting a few "other" categories, the balance sheet states that:

Securities + Lending = Autonomous factors (Currency, TGA, other) + [Reserves+ON RRP balances] (1)

The balance sheet serves three purposes.

Money supply: The most basic task of the Fed is to supply money. All the Fed's liabilities are types of money. The Fed supplies the autonomous factors elastically to accommodate the prevailing demand (thus the name "autonomous"). The largest category within autonomous factors is currency followed by the Treasury General Account. The largest sub-category within other autonomous factors is the foreign repo pool which represents repo investments by foreign official and international accounts with the Fed as a counterparty. To supply the autonomous factors, the Fed purchases securities or lends.[2] As for reserves, they are liquid balances owned by banks and held with the Fed as a store of value, to clear payments, and to satisfy liquidity requirements (e.g., the Liquidity Coverage Ratio and intraday liquidity requirements under Regulation YY). The Internet Appendix reviews the basics of banks' demand for reserves based on the framework of Lopez-Salido and Vissing-Jorgensen (2025). The reserve demand curve traces out the short market interest rate *r* (the federal funds rate) banks are willing to pay to borrow to obtain additional reserves, as a function of reserves held. This interest rate is given by bank's' net benefit of reserves which is the interest rate on reserves (IOR) plus the net convenience yield on reserves (the convenience yield from the liquidity services of reserves, net of the marginal balance sheet cost):

$$r = \underbrace{IOR + v_R'(Reserves, Deposits) - \varphi}_{\text{Net benefit of additional reserves}} \quad (2)$$

It follows that *r-IOR* (with *r* measured as the effective federal funds rate, EFFR) is a natural measure of the economic scarcity of reserves. It captures how much banks value reserves due to their net convenience yield, i.e., above and beyond the fact that they pay interest. An EFFR-IOR spread above zero thus indicates reserve scarcity with ample reserves instead mapping to zero or negative EFFR-IOR spreads. A reserve supply that sets the net convenience yield to zero or a negative value is "ample" in the sense that it supplies

[2] For example, suppose households or firms demand more currency. Banks order more currency from the Fed, paying by lowering banks' reserves at the Fed. The Fed can then buy securities, paying by increasing reserves. On net, reserves are unchanged, while currency and securities are higher.

what banks value for liquidity and regulatory purposes (and more, if the net convenience yield is negative). Since the financial crisis, the Fed has operated in an ample reserves framework.

Financial stability/lender of last resort: A second use of the Fed's balance sheet is to perform emergency lending to US financial institutions (via the discount window or other facilities) or foreign banks (via central bank liquidity swaps), typically funded with additional reserves.

Monetary policy (conventional and quantitative easing): The third and crucial function of the Fed is to conduct monetary policy. On the liability side of the balance sheet, reserves and overnight reverse repo balances (repo investments by US non-banks with the Fed as a counterparty) serve this purpose. However, because the Fed pays interest on reserves (IOR), implementation of conventional monetary policy -- ensuring that the effective federal funds rate clears in the target range -- does not prescribe a particular supply of reserves (Goodfriend (2002), Vissing-Jorgensen (2023)). A given equilibrium short market rate can be reached with a low IOR (and thus low reserve demand) and high net convenience yield (which requires a low reserve supply), or with a high IOR and low net convenience yield (high reserve supply). Post-GFC, the Fed has chosen the latter, with a large reserve supply providing liquidity services to banks and used to fund quantitative easing (QE) or market functioning purchases. At some points in the post-GFC period, reserve supply has been so large that EFFR would be substantiallly below IOR absent further facilities. To avoid this outcome, the Fed has used its overnight reverse repo (ON RRP) facility to reduce reserve supply for a given value of its asset holdings (Internet Appendix Figure A2, middle panel).

Figure 2 Panel A shows the evolution of the Fed's assets over time. The various rounds of quantitative easing is visible in the asset total, as are the large market functioning purchases at the start of the COVID pandemic. Lending to domestic financial institutions is substantial during crisis, including during the Sillicon Valley Bank crisis in 2023. Figure 2 Panel B shows the various Fed liabilities over time. Among the autonomous factors, currency trends up smoothly in contrast to the TGA. Reserves and ON RRP balances fluctuate to supply ample reserves and fund securites and lending in excess of the autonomous factors, with ON RRP balances large during in the period after the pandemic.

3. Drivers of the Treasury General Account

Given the magnitude and volatility of the Treasury General Account, this section sheds light on its drivers. I highlight the role of the Treasury's target size for the TGA over time, debt ceiling episodes (which lead to TGA reductions and rebuilding), as surprises and seasonality in the deficit as well as in Treasury issuance.

a. Changes to the Treasury's target size for the TGA over time

In the years leading up to the financial crisis, TGA balances were near $5B, with modest volatility.

Fluctuations in the Treasury's cash balance (due to differences between deficits and net debt issuance) were instead mainly reflected in the Treasury's accounts at private banks, the Treasury Tax and Loan Note Accounts (Santoro (2012)). This arrangement ensured that movements in the TGA did not cause substantial volatility in reserve supply which would have necessitated large and frequent open market operations to stabilize reserves during the scarce reserves-regime used by the Fed pre-financial crisis.

The Federal Reserve started paying interest on reserves on October 9, 2008. This increased reserve demand, thereby keeping the effective federal funds rate from falling below the desired target range even with the large reserve supply resulting from emergency lending and QE. From late 2008 and in the years following, EFFR cleared below IOR. This meant that the Treasury (taxpayers) would benefit from holding fewer deposits at private banks and more with the Fed. The Treasury would then forego interest at private banks (where government deposits earned less than EFFR, see again Santoro (2012)) but reserves would fall, and the Fed would pay less in interest on reserves and would remit higher profits to the Treasury. Accordingly, the Treasury changed its cash management policy to hold almost no deposits with private banks and instead rely mainly on the TGA. The resulting increase in the level and volatility in the TGA from October 2008 is visible in the TGA time series in Figure 1 Panel A.

A second main change to the Treasury cash management policy was announced in the May 6, 2015, Quarterly Refunding Statement.[3] Citing several events occurring over the prior 15 years (the September 2001 attacks and Superstorm Sandy in October 2012), as well as the risk of cyber-attacks, the statement laid out a change in the Treasury's cash management policy to keep a higher TGA level: "To help protect against a potential interruption in market access, Treasury will hold a level of cash generally sufficient to cover one week of outflows in the Treasury General Account, subject to a minimum balance of roughly $150 billion." Over time, the Treasury's desired TGA level has evolved with updated estimates of outflows. The black line in Figure 1 Panel A shows the Treasury's projected level for the TGA at the end of the next quarter, collected from the Treasury's Marketable Borrowing Estimates issued quarterly. This projected level is the Treasury's target level in periods where the actual and projected TGA values are not affected by ongoing debt ceiling episodes. The latest value is $850B.

b. Debt ceiling dynamics

Debt ceiling dynamics also contribute to the positive correlation between debt issuance and TGA changes from 2015. Clearly visible in Figure 1 Panel A are several periods during the past decade with downward spikes in the TGA, followed by rapid increases. These episodes relate to the debt ceiling, with the dashed

[3] Quarterly Refunding Statement of Acting Assistant Secretary for Financial Markets Seth B. Carpenter | U.S. Department of the Treasury

vertical lines in the figure marking dates on which the debt ceiling was either increased or suspended (I mark dates from 2015 onward only). When the debt ceiling is binding, the government cannot cover its deficit via debt issuance and instead continues to make payments by reducing its balance in TGA. After an increase or suspension of the debt ceiling, the Treasury typically issues substantial amounts of debt to replenish the TGA to the desired level.

To be more precise about this, consider how the TGA changes from day to day. The TGA does not pay interest and evolves according to the relation:

$$TGA_t - TGA_{t-1} = \underbrace{Deposits_t - Withdrawals_t}_{Surplus_t}$$

$$+ \underbrace{Public\ Debt\ Cash\ Issues_t - Public\ Debt\ Cash\ Redemptions_t}_{Net\ Public\ Debt\ Cash\ Issues_t} \quad (3)$$

Equation (3) applies to the government's total cash balance including accounts with private banks. In a period with close to no holdings at private banks, it applies to the TGA. Deposits into the TGA come mainly from taxes while withdrawals are from both spending and interest payments on Treasury debt. Withdrawals exclude cash flows from debt issuance and redemption which are captured by the second line. Public debt *cash* issues and redemptions exclude changes to the intragovernmental holdings of Treasury debt which are part of the total public debt but do not generate cash flows to/from the TGA.[4] The second line in (3) can also be expressed as the change in the total public debt from date *t-1* to *t*, minus the change in the intragovernmental holdings from date *t-1* to *t.*[5]

Figure 1 Panel B plots the components of Equation (3) using rolling 90-day changes in the TGA and rolling 90-day sums for the surplus (Deposits-Withdrawals) and net public debt cash issues (Issues-Redemptions). It is constructed using daily data from the Daily Treasury Statement. Prior to 2015, the Treasury lined up net public debt cash issuance quite closely with deficits, resulting in modest changes in the TGA over time. By contrast, in the period since 2015, where the Treasury has operated with a larger (on average) and more volatile TGA, the 90-day change in the TGA is often large, indicating that net public debt cash issuance is not lined up with deficits as tightly. Notably, when the debt ceiling binds, net public debt cash issuance is generally low, and the TGA tends to fall to cover the deficit (notice how the 90-day changes in the TGA are typically negative in the periods leading up debt ceiling suspensions/increases). A subtlety here is that the debt ceiling applies to total public debt, including the intragovernmental holdings, and the Treasury has

[4] For example, if the government compensates employees by giving them newly issued Treasuries in their pension plan, this type of Treasury issuance does not generate a cash inflow to the TGA.
[5] This ignores a few small categories. See the Daily Treasury Statement Table IIIB for details.

some flexibility to reduce the amount of intragovernmental holdings when the debt ceiling binds.[6] One approach is to redeem existing investments of (and suspend new investments in) the Civil Service Retirement and Disability Fund and the Postal Service Retiree Health Benefits Fund. The Treasury can then keep issuing some (modest) amounts of marketable debt without exceeding the debt ceiling. Figure 1 Panel C illustrates debt issuance with a split into marketable and non-marketable debt (which is mainly intragovernmental holdings).[7] The pink line shows the 90-day net issuance of non-marketable debt. It is negative leading up to debt ceiling suspensions/increases, thus allowing the 90-day net issuance of marketable debt (the blue line) to exceed the 90-day net issuance of total Treasury debt (the black line) at these times. Nonetheless, with a sufficiently large deficit, the TGA still tends to fall while the debt ceiling binds and the TGA will eventually reach zero if the debt ceiling is not suspended or increased. At that point large debt issuance replenishes the TGA (and the above-mentioned retirement funds). This is visible in Figure 1 Panel B by the large net issuance and positive TGA changes in the periods after debt ceiling increases or suspensions. The quick replenishment of the TGA is also apparent in Figure 1 Panel A.

The dynamics around the debt ceiling leads to a strong positive correlation between net public debt cash issuance and changes in the TGA, the blue and red lines in Figure 1 Panel B. This correlation is driven by net issuance of Treasury bills being highly correlated with changes in the TGA, illustrated in Figure 1 Panel D. The Treasury uses net bill issuance as the buffer for overall issuance, adjusting the net issuances of notes and bonds only gradually under its long-standing policy of keeping issuance of notes and bonds "regular and predictable" (Garbade (2007), Liang (2021), Cassidy and Mirani (2024)). Figure 1 Panel E shows 90-day net issuance for overall marketable Treasury debt, Treasury bills, and Treasury notes and bonds. The figure shows a tight relation between the 90-day net issuance of overall marketable Treasury debt and 90-day net issuance of Treasury bills. The gradual change to issuance amounts (auction sizes) for notes and bonds is illustrated by the orange line which increases only gradually with higher borrowing needs (visible after the onset of the financial crisis and the COVID pandemic). As a result of the regular and predictable issuance policy, higher debt initially results in shorter average maturity even if the Treasury subsequently tends to lengthen average maturity (e.g., Greenwood, Hanson, Rudolph and Summers (2015)).

c. Surprises and seasonality

A final contributor to volatility in the TGA is shocks to spending and taxes, as well as seasonal patterns around key tax and issuance dates. For example, the end of June 2020 projection issued in the February 2020 Marketable Borrowing Estimates announcement was $400B, much below the realized value of about

[6] This is one of the Treasury's "extraordinary measures", see Description of the Extraordinary Measures.
[7] See the Monthly Statement of the Public Debt of the United States for details.

$1.7T. The high realized value resulted from lower-than-expected expenditures and higher-than-expected receipts in the second quarter of 2020 (according to the August 2020 Marketable Borrowing Estimates announcement) as well as from an increase in the planned June 2020 TGA value (stated in the May 2020 Marketable Borrowing Estimates announcement).

4. Approaches for the Fed to address TGA fluctuations

This section turns to the Federal Reserve's options for adjusting its balance sheet in response to TGA fluctuations and principles that may guide the choice between options.

a. The four possible approaches

Consider the Fed's balance sheet (omitting the "other" categories in Table 1).

Assets	**Liabilities**
Securities	Autonomous factors
Lending	Currency
	Treasury general account (TGA)
	Reserves
	Overnight reverse repo balances (ON RRP)

When the TGA fluctuates, something else must change on the Fed's balance sheet for it to balance. The Fed supplies currency in the amount demanded by households and firms so letting currency adjust is not an option. That leaves four variables that may adjust to TGA fluctuations: Reserves, ON RRP balances, securities or lending. I label the four corresponding approaches as follows.

1. *Ample reserves:* In this approach, reserves are kept high on average and reserves are allowed to adjust to changes in the TGA, in the opposite direction. Because reserve supply is (on average) large, letting reserves fluctuate in response to TGA fluctuations will not generate much interest rate volatility because the equilibrium moves around on a fairly flat part of the reserve demand curve. I illustrate this approach in Figure 3, Panel A which shows the effect of autonomous factor shocks on the equilibrium short market interest rate (EFFR). The chart is from Lopez-Salido and Vissing-Jorgensen (2025) (LSVJ).

2. *Ample reserves with positive ON RRP balances:* In this approach, Fed borrowing from financial institutions via the ON RRP facility adjusts to TGA fluctuations, in the opposite direction of the TGA. The ON RRP facility serves to prevent market rates from falling too far below the interest rate on reserves in situations with a very large Fed balances sheet (large securities holdings relative to what can be funded with the autonomous factors). When ON RRP balances are positive, if the Fed takes no

action in terms of adjusting its securities holdings, fluctuations in ON RRP balances serve as a buffer that insulates reserves from TGA fluctuations, thereby limiting interest rate volatility.[8]

3. *Active securities:* Another option is to adjust Fed securities holdings in the same direction as the TGA and keep other Fed liabilities unaffected. I denote this an "active securities" approach. Figure 3, Panel B illustrates this approach. If the Fed's securities holdings are changed one-for-one with the TGA, then reserve supply is kept unchanged, as is the equilibrium short market rate. An active securities approach would adjust Fed securities holdings via changes to asset purchases or asset runoff or via traditional open market operations.

4. *Positive lending:* A final possibility is for the Fed to operate in a regime with positive lending. For example, it could lower the interest rate on its lending facilities to generate substantial lending balances. When lending is positive, fluctuations in lending (in the same direction as the TGA) can buffer reserves from TGA fluctuations.[9]

Since the global financial crisis, the Fed has mostly taken a passive approach to TGA balances, letting reserves plus ON RRP balances adjust rather than changing the overall balance sheet size. This is a mix of the ample reserves approach and the amples reserves with positive ON RRP balances approach. With large securities holdings driven by its QE and market functioning purchases, reserve supply has generally been ample, thus allowing the Fed to let reserves plus ON RRP balances adjust to TGA fluctuations without this generating substantial interest rate volatility. In periods with large ON RRP take-up, the ON RRP has served as a shock absorber, further limiting interest rate volatility. The FOMC clarified its policy in January 2019, stating: "The Committee intends to continue to implement monetary policy in a regime in which an ample supply of reserves ensures that control over the level of the federal funds rate and other short-term interest rates is exercised primarily through the setting of the Federal Reserve's administered rates, and in which active management of the supply of reserves is not required."[10] The ability to let reserves plus ON RRP balances adjust passively to TGA fluctuations without resulting interest rate volatility has generally been viewed as one of the benefits of an ample reserve supply (e.g., Zobel (2022)). The ample reserves approach was confirmed in January 2022 prior to the current period of balance sheet normalization (QT) which started in the spring of 2022: "Over time, the Committee intends to maintain securities holdings in amounts needed to implement monetary policy efficiently and effectively in its ample reserves regime."[11]

[8] The equilibrium with positive ON RRP balances is illustrated in the Internet Appendix, Figure A2 (middle panel).
[9] The equilibrium with positive lending is illustrated in the Internet Appendix, Figure A2 (bottom panel).
[10] Statement Regarding Monetary Policy Implementation and Balance Sheet Normalization
[11] Federal Reserve Board - Policy Normalization

Figure 4 illustrates the strong negative correlation between changes in the TGA and changes to reserves plus ON RRP balances that results from the ample reserves/ample reserves with positive ON RRP balances approaches, especially in the second half of the sample. Reserves plus ON RRP balances have fluctuated with the need to fund quantitative easing and market functioning purchases and with TGA fluctuations. In the first half of the sample, QE effects dominate and the successive rounds of QE (initiated in 2008, 2010 and 2012) are visible in reserves plus ON RRP balances, while TGA balances pre-2015 were fairly stable. With the change in the Treasury's cash management policy in 2015 and large TGA fluctuations due to debt issuance dynamics including debt ceiling effects, the TGA becomes more volatile and is matched by opposing movements in reserves plus ON RRP balances. The movements in 2020 are an exception as market functioning and QE purchases in 2020 were so large that reserves plus ON RRP balances increased despite the sharp increase in the TGA.

As for the active securities approach, this was used reactively in mid-September 2019 when an increase in the TGA (occurring after a period of balance sheet runoff), among other factors, led to reserve scarcity and repo market disruptions until it was addressed by open market operations.

Since Fed lending tends to be modest, an active lending approach has not been used at the Fed, but the Bank of England has recently implemented this approach. The Fed instead uses its lending facilities only as backstops. In July 2021, the Fed added a new backstop facility, the Standing Repo Facility (SRF), to more effectively limit interest rate volatility. The SRF has broader eligibility than the discount window in that dealers (as opposed to only banks) have access. Furthermore, the SRF rate and the discount window rates are now at the top of the target range, as opposed to the discount window rate being 50 bps above the top of the range in September 2019. The Fed has furthermore emphasized operational readiness of potential borrowers in using its lending facilities.

b. Design principles for policy choice

When comparing approaches, the following design principles may be considered relevant.

Interest rate control: It is desirable to avoid reserve scarcity which could be associated with interest rate volatility.

Control of the Fed's overall policy stance: In addition to short market rates, the Fed's policy stance is affected by the amount of stimulus imparted by asset holdings acquired for QE or market functioning purposes. It is desirable to avoid an effect of TGA fluctuations on the policy stance.

Communication: The Fed may not want to be perceived as changing its policy stance (short rates or longer rates) in response to fluctuations in the TGA. This could be perceived by the public as fiscal policy affecting monetary policy, even if the effect is of a somewhat technical nature.

c. A new angle on the active securities approach: Back the TGA with bills and adjust reactively

In the next section, I will review the problems with ample reserves approaches and argue that a simple version of an active securities approach would score better on the above policy design criteria. The approach I put forward for consideration is to back the TGA with Treasury bills (or other short-maturity investments) and adjust Treasury bill holdings with fluctuations in the TGA. Treasury bill holdings would be reduced when the TGA falls. This could be done by simply letting Treasury bills roll off, or via outright bill sales. Conversely, Treasury bill holdings would be increased when the TGA increases. This approach is effectively TGA "segregation" in the sense that part of the Fed's balance sheet would effectively be separated into a simple component which has only Treasury bills on the asset side and the TGA on the liability side.

5. Challenges of ample reserves approaches and how backing the TGA with bills could help

a. Interest rate control

This section lays out the challenges related to interest rate control that emerge in ample reserves regimes and then argues that an active securities approach of backing the TGA will bills would score better on the interest rate control criteria.

a.1. The risk of interest rate spikes

In an ample reserves operating framework (with or without positive ON RRP take-up), reserves must be kept ample at all times to avoid substantial interest rate volatility. However, the reserve demand function is not known perfectly in terms of its drivers and functional form, leading to uncertainty about the reserve level at which interest rate volatility may increase materially. Interest rate volatility can arise from reserve supply shocks driven by the autonomous factors, from reserve demand shocks, or from a combination of the two. As is clear from Figure 3 Panel A, because of the convexity of the reserve demand curve, the effect of reserve supply shocks is larger at lower supply because the equilibrium the fluctuates on a steeper part of the demand curve. Furthermore, again due to reserve demand curve convexity, horizontal reserve demand shocks have a larger effect on the equilibrium short rate at lower levels of supply. Reserve supply and

demand shocks may be linked in that a negative reserve supply shock may cause a transitory positive demand shock to aggregate reserve demand until reserves have re-equilibrated across banks.[12]

The literature on the September 17, 2019, yield spikes (e.g., Anbil, Anderson and Senyuz (2020), Lopez-Salido and Vissing-Jorgensen (2025)) links these spikes to lower reserve supply. After a period of balance sheet normalization, an increase in the TGA appears to have been the final straw that drove reserves too low from an interest rate volatility perspective. The literature suggests that the effective federal funds rate spike was too large to be explained purely by the drop in reserve supply that resulted from the TGA increase given the estimated aggregate reserve demand function. Reserve demand appears to have temporarily shifted up at the same time, possibly due to the link described or due to spillovers from the repo market which experienced a shortage of funding. The repo funding shortage emerged from a higher Treasury supply (which led to increased need for repo funding) and tax payments (which led to reduced money market fund assets and thus reduced supply of repo funding from money market funds).

Given uncertainty about the level of reserves at which substantial interest rate volatility may emerge, an ample reserves regime comes with a risk of substantial interest rate volatility, especially when autonomous factors are at their peak level. Lopez-Salido and Vissing-Jorgensen (2025) provide a partial solution to this problem. They estimate reserve demand and show that the predicted EFFR-IOR spread peaked in September 2019, suggesting that the predicted spread (which was 4 bps) can be used as a guide to the level of reserve ampleness or scarcity at which interest rate volatility may pick up. Balance sheet normalization can then be stopped before that predicted spread is reached. However, given estimation uncertainty, the confidence interval for the range of reserve (plus ON RRP) supply that leads to the same predicted EFFR-IOR value as in September 2019 is quite wide. This leaves ample reserves approaches difficult to implement in practice, with a tradeoff between keeping reserve supply larger than may be necessary or risking more interest rate volatility. The literature covers a range of potential welfare costs to large central bank balance sheets, including reserves crowding out bank lending Diamond, Jiang and Ma (2024), and Chakraborty, Goldstein and MacKinley (2020)), reserves crowding in bank deposits (with associated financial stability risks, if the deposits are uninsured, Acharya, Chauhan, Rajan and Steffen (2022)), reductions in available convenient assets available to investors if central banks supply reserves via holdings of such asset (Vissing-

[12] In the words of Dallas Fed President Lorie Logan: "When reserves drop sharply on a single day, the banks that initially lose reserves aren't necessarily those that value reserves the least. Until the reserves redistribute, there's a temporary increase in aggregate reserve demand." (Speech, August 25, 2025, Opening remarks for panel titled 'Post-Pandemic Challenges for Monetary Policy Implementation' - Dallasfed.org).

Jorgensen (2023)), and the risk of central bank losses from large balance sheets leading to threats to central bank independence and less headroom for future QE (Hauser (2022)).[13]

The addition of the Standing Repo Facility in 2021 is helpful for limiting interest rate volatility from any unintended reserve scarcity. However, the SRF rate may still not put an upper bound on short market rates if the faclity has stigma, if the facility is viewed as unattractive due to a lack of central clearing, or if limits on borrowing per counterparty bind. The fact that the SRF is not used in "normal" times may worsen the issue of stigma, relative to a setting such as that at the Bank of England where repo lending is substantial at all times.

An active securities approach would allow the Fed to have a ***smaller average reserve supply with a similar risk of interest rate volatility,*** *a* ***lower risk of interest rate volatility for the same average reserve supply*** (and overall balance sheet size), or a mix of the two. To see this, consider a simple example.

> *Example:* Suppose the TGA fluctuates between $TGA^{min} = \$0B$ and $TGA^{max} = \$800B$ with a mean of $400B and that the Fed estimates the minimum level of reserves that is sufficient to prevent substantial interest rate volatility is $2.8T.[14] The $2.8T is the point estimate, with associated estimation uncertainty. Suppose the Fed is sure that $3T is ample.
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> *Case 1.* The Fed decides to avoid reserve levels below $3T.
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> With an ample reserves approach, Fed assets are not changed in response to TGA fluctuations. The Fed would supply reserves of $3T when $TGA = TGA^{max}$, with reserves averaging $3.4T and reserves (which at that point may partly become ON RRP balances) peaking at $3.8T when $TGA = TGA^{min}$.
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> By contrast, with an active securities approach, reserves could be kept near $3T at all times, because Fed assets would be adjusted with the TGA, $400B less than in the ample reserves approach.
>
> *Case 2:* The Fed is willing to let reserves fall to $2.8T, recognizing that this involves some risk of interest rate volatility.
>
> With an ample reserves approach, the Fed would need to supply reserves of $2.8T when $TGA = TGA^{max}$, with reserves averaging $3.2T and reserves (which at that point may partly become ON

[13] The last of these problems arising from large balance sheets could be overcome with central bank holdings of short-maturity assets like Treasury bills (thus allowing assets and liabilities to be duration matched and avoiding a need for active management of bill holdings if reserve supply was sufficiently large). However, this does not overcome the other three issues arising from large balance sheets.

[14] Both the TGA and reserves amount sufficient to prevent interest rate volatility likely trend over time, but the conclusion carries over.

RRP balances) peaking at \$3.6T when $TGA = TGA^{min}$. Given uncertainty about the level of reserves sufficient to prevent substantial interest rate volatility, even an average reserve supply of \$3.2T will involve some risk of interest rate volatility because reserves will fall as low as \$2.8T which may turn out to be too low.

With an active securities approach, one option for the Fed would be to choose the same average reserve supply of \$3.2T with reserves now always near this number because Fed assets would be adjusted with the TGA. With reserves never falling much below \$3.2T, there would be little risk of interest rate spikes because \$3.2T provides a large buffer above the \$2.8T estimated ample level. Alternatively, the Fed could choose a reserve supply below \$3.2T, low enough to keep the average expected interest rate volatility the same as in the ample reserves approach with average reserves of \$3.2T. This would correspond to a supply below \$3.2T and above \$2.8T. If the Fed was willing to tolerate the interest rate volatility risk associated with \$2.8T of reserves, then reserves could be kept at \$2.8T at all times, again \$400B below the average level in the ample reserves regime.

The example illustrates how the active securities approach would allow for a smaller balance sheet size, a lower risk of substantial interest rate volatility, or a mix of the two. This would be the case regardless of which asset was used to back the TGA, but using bills has advantages that will be discussed below (it keeps the Fed's overall policy stance unchanged and frees up bills for the private sector during debt ceiling episodes thus supporting interest rate control due to bill scarcity).

Figure 5 illustrates how the Fed's balance sheet would evolve with the TGA under the approach of backing the TGA with bills. The figure is focused on what the balance sheet would look like in the absence of a need for QE, market functioning purchases or lender of last resort lending. One could refer to this as the Fed's "steady state" balance sheet or "money supply" balance sheet. On the liability side, the TGA as well as currency and other autonomous factors would fluctuate as they did historically. An estimate of the time series of the ample level of reserves is illustrated with the purple line. The ample reserves estimation is taken from Lopez-Salido and Vissing-Jorgensen (2025). They assume that the convenience yield on reserves net of the marginal balance sheet cost is log-linear in reserves and liquid deposits,

$$v_R'(Reserves, Deposits) - \varphi = B + C * \ln(Reserves) + D * \ln(Liquid\ Deposits) + U \qquad (4)$$

and thus estimate a reserve demand function of the form[15]

$$EFFR - IOR = B + C * ln(Reserves) + D * ln(Liquid\ Deposits) + U \qquad (5)$$

[15] They account for the fact that the ON RRP facility implies a lower bound for $r - IOR$ (see their paper for details).

In (5), C is negative because the marginal value of reserves falls with additional reserve holdings, while D is positive because the marginal value of reserves is higher when the banking sector has more liquid deposits to manage. Defining ample reserves (the minimum level at which reserves are ample) as the level at which the EFFR-IOR spread is predicted to be zero, the ample reserves level is given by

$$0 = B + C * \ln(Reserves) + D * \ln(Liquid\ Deposits) \quad (6)$$

$$\Rightarrow Reserves^{Ample} = \exp\left(\frac{-B - D*\ln(Liquid\ Deposits)}{C}\right). \quad (7)$$

Under an approach of backing the TGA with bills, reserves supplied for money supply purposes would follow the ample reserves series and – importantly – reserves would thus not fluctuate with the TGA. Instead, the size of the Fed's assets would be adjusted with the size of the TGA as illustrated in the left chart. Bill holdings held for the purpose of supplying the TGA would move with the TGA (the red line is the same in both charts). Additional assets (the blue line) would be held to supply the sum of currency and other autonomous factors plus ample reserves. I do not take a stand here what the composition of those assets should be.[16] In short, total Fed assets would fluctuate with money demand.

In periods where QE, market functioning purchases or lender of last resort lending were needed, the balance sheet may be larger than that illustrated, or the asset composition may differ. For example, with a maturity extension program asset size would be unaffected but asset composition would not.

a.2. Scarcity of safe Treasury bills leading to low bill rates during debt ceiling episodes

A secondary issue related to interest rate control is fluctuations in bill yields during debt ceiling episodes. Stein and Wallen (2025) study yield differences between Treasury bills and repo investments, focusing on the 2023 debt ceiling episode. They provide evidence of a scarcity of T-bills that matured before the expected X-date (the date on which the TGA was expected to hit zero), leading to very low bills yields, followed by high bill yields near the X-date for bills maturing after the expected X-date.[17] Figure 6 replicates Stein and Wallen's fact for 2023 and adds data up to September 4, 2025, to also cover the 2025 debt ceiling episode. The yield on 1-month Treasury bills fell more than 100 bps below the expected 1-month rate on the Fed's ON RRP facility in March and April of 2023 before increasing sharply above the

[16] I have argued elsewhere (Vissing-Jorgensen (2023)) that welfare may be higher if central banks supply money by holding assets that themselves do not have large convenience yields because a central bank supplying a steady amount of money does not benefit from the liquidity/safety of those assets. This argument would suggest supplying currency and other autonomous factors with assets other than Treasuries.

[17] Cassidy and Mirani (2025) use the dynamics of Treasury bill issuance during debt ceiling events to construct three instruments for bill issuance. They document that lower bill issuance leads to increased scarcity of bills, evidenced by larger convenience yields on bills, as well as downward pressure on short rates more generally, with even yields on highly rated corporate debt falling and some evidence of increase commercial paper issuance.

expected 1-month ON RRP rate from May 4.[18] This suggests that the market expected an X-date in early June, consistent with the Treasury stating on May 1 that it would be unable to meet its obligations by early June.[19] The low yield on 1-month bills maturing before the expected X-date likely emerged from an increase in the yield discount on safe and liquid securities amid a deterioration in the perceived safety or liquidity of bills (and possibly notes and bonds) maturing after the X-date. Stein and Wallen (2025) investigate why repo investments (at the Fed or in private markets) do not serve as a good substitute for T-bill investments, emphasizing that some investors prefer bills because they are used as collateral in derivatives and other transactions. The right part of Figure 6 provides related evidence for the 2025 debt ceiling episode. The 1-month bill yield fell about 20 bps in June 2025, with little change in the 1-month expected ON RRP rate. The effect is thus less dramatic than for the 2023 episode, likely because this event was resolved farther from the X-date which the Treasury projected to be in August 2025. As a result, the fraction of bills maturing after the expected X-date was smaller, leading to a lower downward pressure on bills that matured before this date.

Switching to an active securities regime in which the TGA is backed with bills could have some benefit in alleviating the bill scarcity illustrated in Figure 6. If the Fed's bill holdings fall when the TGA falls, this frees up more bills to hold for non-Fed holders. For example, the Fed could adjust its bill holdings with the TGA by letting some of its bills mature and not buying new bills to replace maturing ones. As the Treasury rolled over maturing bills into new ones, these could be purchased by sectors other than the Fed. Newly issued bills maturing before the X-date would be attractive to non-Fed buyers. Figure 7 provides an illustrative example to show graphically how backing the TGA with bills and changing Fed Treasury bill holdings in response to TGA fluctuations would stabilize the path of private sector Treasury bill holdings in debt ceiling episodes.

> *Example:* The example contrasts three scenarios. One with no debt ceiling episode in an ample reserves regime (left chart in all panels in Figure 7), a debt ceiling episode in an ample reserves regime (middle charts), and a debt ceiling episode in a regime where the TGA is backed with bills. Time is in months. Quantities are just examples and are not closely calibrated to the data.
>
> With a debt ceiling event, suppose the debt ceiling starts to bind at date 3 and is increased or suspended on date 8 which is also the X-date. The TGA is rebuilt at date 9. For simplicity, assume that absent debt ceiling issues, the Fed's balance sheet and its components would all be stable over

[18] They calculate the expected ON RRP rate over the next month as of day t as:
ON RRP rate(t)+[1-month OIS(t)-effective fed funds rate(t)] where the OIS is based on the effective fed funds rate and the term in square brackets thus measures the 1-month term premium.
[19] Secretary of the Treasury Janet L. Yellen Sends Letter to Congressional Leadership on the Debt Limit | U.S. Department of the Treasury

time (this is not central to the argument made). Assume furthermore that the government is running a deficit and debt increases (in fixed proportions in terms of bills versus notes/bonds) unless the debt ceiling binds. The government keeps note and bond issuance regular and predictable (including being unaffected by debt ceiling episodes). The Fed holds bills only in the regime of backing the TGA will bills. In this regime, the example assumes that total Treasury bill supply is higher by the peak amount of the TGA (section 6 discusses how the Treasury is likely to adjust supply to sustained changes in Fed demand).

Absent a debt ceiling episode, the TGA is stable and reserves plus ON RRP balances are constant (Panel A left). With a debt ceiling episode, the TGA falls while the debt ceiling is binding (date 3 to 8) before being increased fast after the debt ceiling is increased or suspended (Panel A, middle and right). In an ample reserves regime, reserves plus ON RRP balances increase while the debt ceiling is binding, as the TGA declines while Fed assets are unchanged (Panel A, middle). By contrast, in a regime where the TGA is backed with bills, reserves plus ON RRP balances are isolated from TGA fluctuations (Panel A right) as the Fed's assets (bill holdings) adjust with the TGA.

With a debt ceiling episode, to keep note and bond supply unaffected, total bill supply is reduced. In an ample reserves regime, bill supply held by non-Fed holders drops (Panel B, middle chart). This is not the case if the TGA is backed with bills. Under this Fed policy, the Fed's bill holdings equal the TGA (the two lines overlap in Panel A right) which implies that fluctuations in Fed bill holdings buffer fluctuations in total bill supply. When the debt ceiling binds, the Fed's bill holdings fall with the TGA, thus freeing up bills to hold for non-Fed holders. Once the debt ceiling is raised or suspended, the Fed buys part of the large amount of bills issued, leaving bill holdings of non-Fed holders to trend up smoothly through the debt ceiling episode (Panel B right). In fact, bill holdings of non-Fed holders evolve just as they would absent a debt ceiling episode (the green lines are identical in Panel B left and Panel B right)

Due to the regular and predicable note and bond issuance policy, notes and bonds held by non-Fed holders are the same in all cases (illustrated by the green lines in Panel C).

In the example, from when the debt ceiling binds and until the TGA is rebuilt, bill holdings of non-Fed holders are thus higher under the policy of backing the TGA with bills. This is beneficial to the extent that the extra bills mature before the X-date and thus have convenience yields from their safety and liquidity. That would be the case during the first months of a debt ceiling event. If the

debt ceiling episode continues to the X-date, all Treasury bills mature past the X-date so at that point bills no longer provide convenience yields to their holders regardless of the Fed's decisions.

b. Control of the Fed's overall policy stance: TGA fluctuations complicate quantitative tightening

A further challenge when managing an ample reserves regime emerges if a debt ceiling episode takes place during a period of quantitative tightening.

Figure 8 Panel A illustrates the issue. Start at equilibrium 1 at which the Fed holds a particular amount of securities and the TGA and thus autonomous factors overall are at the Treasury's projected ideal value. Suppose the Fed is in a phase of quantitative tightening, reducing its security holdings gradually over time. Absent a debt ceiling event, the equilibrium would gradually move left from point 1 toward point 3, with reserves falling one for one with Fed securities holdings (once ON RRP balances go to zero, as is the case in the figure). Along the way, the Fed may decide to end QT before point 3 is reached if interest rate volatility increases more than intended. By contrast, suppose the debt ceiling becomes binding right as the equilibrium is at point 1 and that the Treasury funds the deficit by reducing the TGA. If the TGA (plus currency) declines faster than the Fed's securities holdings, then net securities (securities minus the autonomous factors) and thus reserve supply will *increase* even though the Fed is doing QT. In this case, the equilibrium will move to the right over time, as illustrated by point 2 in the chart. Once the debt ceiling is raised or suspended, the Treasury quickly rebuilds the TGA back toward normal values over a few months, resulting in a fast transition from point 2 to point 3 (often call "snapback" risk). If point 3 involves reserve scarcity, the Fed has "overdone" QT because it did not receive any signal about reserve scarcity during the period where the debt ceiling was binding, yet it kept doing QT. The September 17, 2019, yield spikes took place during a period of TGA rebuilding following the August 2, 2019, suspension of the debt ceiling.

Knowing this risk, the Fed may – when standing at a point such as point 1 and assessing that a debt ceiling episode may lead to too much QE -- decide to slow QT, pause QT, or end QT earlier than it would have without a debt ceiling episode. In its March 19, 2025, FOMC statement, the FOMC slowed QT, announcing a reduction in the monthly redemption cap on Treasury securities from $25 billion to $5 billion. The minutes stated that this was a "natural progression of the slowing decided at the May 2024 meeting" but also that "some participants noted that a slower pace of runoff would also help guard against reserve scarcity emerging with little advance notice during a period of potentially rapid increase in the TGA". Market commentary interpreted the slowing of QT as due to debt ceiling concerns as described above.[20]

[20] Wall Street Journal, March 19, 2025, Fed Tweaks Its Balance-Sheet Approach as Debt Ceiling Looms - WSJ

Figure 8 Panel B illustrates how concerns about the risk of reserve scarcity during a TGA rebuild could reasonably have been a factor in the FOMC's decision to slow runoff in March 2025. As of March 19, 2025, a debt ceiling episode was in progress. The TGA had been falling since early February, as is visible in the figure. Accordingly, reserves plus ON RRP balances had been increasing over the same period despite ongoing QT, visible in the figure as the uptick in the thin blue line leading up to March 19, 2025 which is the start of the light blue shaded area. Mapping back to Figure 8 Panel A, March 19, 2025, is a bit to the right of point 1 toward point 2. To assess whether it is likely that reserves would fall below ample once the TGA returned to the Treasury's target level, the light blue shaded area of the figure provides projections under the assumption that balance sheet runoff had been continued with unchanged redemption caps ($25B/month for Treasuries and $35B/month for MBS). The thick blue line shows the hypothetical evolution of the value of reserves plus ON RRP balances after TGA rebuild (corresponding to point 3 in Figure 8 Panel A). The line slopes down because the longer it may take for the debt ceiling to be raised/suspended and the TGA to be rebuilt, the more balance sheet runoff would be done in the meantime and thus the lower the value of reserves plus ON RRP balances at the time the TGA has returned to the target level of $850B. The thick blue line is calculated as

$$\begin{aligned}(\text{Reserves} + \text{ON RRP balances})_t^{Hypothetical} \\ = (\text{Reserves} + \text{ON RRP balances})_{March\ 19,2025}^{Actual} - \left(\$850B - TGA_{March\ 19,2025}\right) \\ + (\#\text{Weeks, March } 19, 2025, \text{to } t) \\ * (\text{Weekly change in Fed assets} - \text{Weekly change in currency etc.})^{Hypothetical}\end{aligned} \quad (8)$$

where the last line estimates how much Reserves + ON RRP balances would change per week post-March 19, 2025, if there had been no change to redemption caps and assuming that weekly changes in currency etc. (i.e., currency and other autonomous factors excluding the TGA) would be roughly similar post-March 19, 2025, as in the recent past. The last line can be calculated as $(\text{Weekly change in Reserves} + \text{ON RRP balances}) + (\text{Weekly change in TGA})$ and is estimated using the averages over the period June 2024 to March 19, 2025, during which redemption caps were constant. The thin purple line in Figure 8 Panel B is an estimate of the level of ample reserves, defined as the value that would set the EFFR-IOR spread to 0 bps (on average over the month, in monthly data). This is the same line as the purple line in Figure 5. The thick purple line extrapolates the ample reserves estimate, assuming the same slope of the line as in the prior 6 months leading up to March 19, 2025.

From Figure 8 Panel B, as of March 19, 2025, the actual value of Reserves + ON RRP balances was at $3.62T much above the estimated ample reserves level at $2.76T. While the ample reserves level is, of course, estimated with uncertainty, the difference between the two values is large. However, as shown by

the thick blue and thick purple lines, over time (1) the level of ample reserves would likely increase as it had in the recent past and (2) the level of Reserves + ON RRP balances after debt-ceiling resolution and rebuilding of the TGA would fall quite fast if the pace of runoff was not slowed. As of May 9, 2025, the Treasury estimated that the estimated X-date could be as early as August.[21] Given uncertainty about the X-date and adding about four months for the TGA to be rebuilt (based on the last few prior debt ceiling episodes), TGA rebuild may not happen until late 2025. At that time Reserves+ON RRP balances (which at that point would likely only be reserves) may be below the ample reserves level. Notice how the thick blue and thick purple lines intersect before the end of 2025 which is the end of the light blue shaded area. Adding to this uncertainty about the true level of ample reserves, it is apparent that the decision to slow Treasury runoff could partly be motivated by a desire to avoid reserve scarcity as some participants noted according to the meeting minutes.

The March 19, 2025, FOMC decision to continue balance sheet runoff at a slower pace reduced the risk of reserve scarcity emerging during a potential rapid increase in the TGA. By helping to ensure that reserves remain ample, the decision scores well on the first design principle of retaining interest rate control. However, with slower runoff, the Fed holds more Treasuries post-March 19, 2025, and thus more assets with duration risk (and convenience yields). In that sense, the ample reserves approach to managing TGA volatility scores less well on the second design principle since changes to assets affect the Committee's overall policy stance.

Under the alternative approach of backing the TGA with bills and adjusting bill holdings with TGA fluctuations, balance sheet runoff of Treasury notes and bonds and of MBS could have been continued without regard to the debt ceiling event. Looking at Figure 8 Panel B, instead of Reserves + ON RRP balances starting to increase as the TGA started to fall in February and March, under the alternative approach Reserves + ON RRP balances would keep falling at the same pace as had the TGA stayed constant. This would be achieved by the combined reduction in bills and in notes and bonds. As a result, the approach of backing the TGA with bills and adjusting bill holdings with TGA fluctuations would help insulate both short and long interest rates from TGA fluctuations as QT could proceed as planned regardless of any debt ceiling episode.

c. Communication

An ample reserves policy comingles the Fed's tasks, making Fed decisions more difficult to communicate. In particular, it may be difficult to communicate that adjusting the Fed's holdings of assets (with duration

[21] Debt Limit Letter to Congress - May 9, 2025

or prepayment risk) in expectation of or in response to fluctuations in the TGA is a technical issue rather than an effect of fiscal policy on monetary policy.

Backing the TGA with T-bills should be easy to communicate. It is a straightforward way to provide banking services to the government while keeping one Fed job (being the government's bank) separate from another Fed job (monetary policy). Historically, the Fed has always accommodated *trends* in autonomous factors demand by increasing its assets, growing assets in line with demand trends. Backing the TGA with bills and adjusting bill holdings reactively would simply extend the historical approach to also address *fluctuations* in the government's banking needs. Furthermore, the change would have no effect on the TGA. The government would have the same ability to increase or decrease TGA balances as previously.

6. Implementation

Frequency of Treasury bill operations: From a practical perspective, with a Treasury bills approach to TGA management, the Fed would need to be decided how much the TGA should be allowed to change before changes to the Fed's Treasury bill holdings are made. As long as substantial reserve scarcity is not desired, day-to-day management of the TGA would not be needed. Weekly or monthly changes to the Fed's Treasury bill holdings would likely be sufficient to prevent any material effects of TGA fluctuations on short rates (in contrast to the pre-GFC regime where daily open-market operations were needed due to the much lower reserve levels). The Fed could design its Treasury bill portfolio with staggered maturities to allow some gradual Treasury bill reductions without outright sales, but some active buying and selling would likely also be needed.

Magnitudes: The Fed currently holds around $200B in T-bills. The latest target level for the TGA announced by the Treasury is $850B (Figure 1 Panel A). A transition to TGA management via T-bills would suggest an increase in the Fed's T-bill holdings of about $650B, with a corresponding decrease in the Fed's demand for notes/bonds. The Fed could roll maturing notes/bonds into Treasury bills for a period of time (1-2 years).

Relation to Treasury issuance and consolidated government finances: The Treasury's focus is on "privately held net marketable borrowing" which nets out effects of Fed holdings.[22] This reflects the fact that since the Fed transmits its profits to the Treasury, Treasuries held by the Fed do not generate a cash flow for the consolidated government. In making its maturity choice, the Treasury would thus naturally adjust its supply mix in response to a sustained change in Fed demand across maturities. If the Fed increased its bill share in a sustained manner, the Treasury could keep the maturity mix of the private sector unaffected by increasing

[22] See, e.g., Treasury Announces Marketable Borrowing Estimates | U.S. Department of the Treasury

the bill share in the overall Treasury supply.[23] In terms of the consolidated government's budget, if the yield curve on average slopes up, then the Fed's profits (and thus its remittances to the Treasury) would tend to be lower with larger Treasury bill holdings and lower holdings of notes/bonds. However, increased bill issuance would lead to corresponding average interest savings for the Treasury. Absent further debt ceiling episode emerge, the Treasury would be completely unaffected in terms of interest expenses, accounting for Fed remittances. Given that further debt ceiling episode are likely to emerge and that the bill holdings of the public would be higher during a debt ceiling episode under the policy of backing the TGA with bills (Figure 7 Panel B middle versus right charts), the choice of policy will have some effect on interest rate expenses, but the sign is unclear. On the one hand, early in the debt ceiling episode the Treasury issues more bills to the public at a time when yields are low, to the benefit of the Treasury. On the other hand, the increase in public bill holdings will likely make these yields not quite as low.[24] Also, in debt ceiling episodes that continue close to the X-date, the Treasury would be rolling over more bills at elevated yields.

7. Conclusion

Via the Treasury General Account, the Federal Reserve provides important banking services to the government and thus the country. Since 2015, the government's money demand has increased and become more volatile. The higher TGA level provides the government a buffer to keep making payments for a week even in the event that Treasury issuance is paused due to a cyber attack, natural disaster, terror attack, or other crisis. Achieving this liquidity buffer is free to tax payers when it is supplied by the Fed: The Treasury issues additional securities and keeps the proceeds in the TGA. The Fed buys the additional securities and returns any interest payments to the Treasury via the Fed's remittances. The Fed is thus a natural supplier of deposits (money) to the government. However, the Fed also needs to achieve its monetary policy objectives, preferably without distortions from TGA fluctuations. A policy of backing the TGA with Treasury bills and adjusting bill holdings with the TGA achieves this. With this policy, the Fed could reduce the risk of interest rate volatility (or the size of its balance sheet or a mix of the two) and could manage its overall policy stance without interference from TGA fluctuations. Keeping the Fed's jobs separate should be easy to communicate to the public.

[23] It is important to note in this regard that a change in the Fed's asset mix in its steady state portfolio is different from a change for stimulus purposes in that the Treasury generally would not be expected to try to fully "undo" the latter.
[24] Even with smooth public bill holdings there would likely be yield effects, just smaller ones. The Fed can add bill supply to the private sector, but some downward yield pressure will likely remain due to substitution from bills (and notes/bonds) maturing after the X-date.

References

Acharya, VV, RS Chauhan, R Rajan and S Steffen (2022). "Liquidity Dependence: Why Shrinking Central Bank Balance Sheets is an Uphill Task", *Kansas City Federal Reserve Symposium.*

Anbil, S, A Anderson, and Z Senyuz (2020). "What Happened in Money Markets in September 2019?", Washington: Board of Governors of the Federal Reserve System, https://doi.org/10.17016/2380-7172.2527.

Cassidy, W and S Mirani (2025). "The Debt Ceiling's Disruptive Impact: Evidence from Many Markets", working paper.

Chakraborty, I., Goldstein, I. and MacKinlay, A. (2020), "Monetary Stimulus and Bank Lending", *Journal of Financial Economics*, Vol. 136, pp. 189-218.

Diamond, W, Y Ma and Z Jiang (2024), "The Reserve Supply Channel of Unconventional Monetary Policy", *Journal of Financial Economics*, Vo. 159, pp. 1-17.

Garbade, KD (2007). "The Emergence of "Regular and Predictable" as a Treasury Debt Management Strategy. Federal Reserve Bank of New York *Economic Policy Review*, Vol 13, No 1.

Goodfriend, M (2002), "Interest on Reserves and Monetary Policy", Federal Review Bank of New York *Economic Policy Review*, Vol. 8, No. 1.

Greenwood R, SG Hanson, JS Rudolph and LH Summers (2015). "The Optimal Maturity of Government Debt", Chapter 1 of "The $13 Trillion Question" (editor David Wessel), Brookings Institution Press.

Hauser, A. (2022). "Thirteen Days in October: How Central Bank Balance Sheets can Support Monetary and Financial Stability", speech at the ECB's 2022 Conference on Money markets.

Liang, N (2021). Remarks by Under Secretary for Domestic Finance Nellie Liang at the 2021 Treasury Market Conference | U.S. Department of the Treasury.

Lopez-Salido, D and A Vissing-Jorgensen (2025). "Reserve Demand, Interest Rate Control, and Quantitative Tightening", working paper.

Santoro, PJ, (2012). "The Evolution of Treasury Cash Management during the Financial Crisis", Federal Reserve Bank of New York, *Current Issues in Economics and Finance*, Vol 18, No 3.

Vissing-Jorgensen, A (2023). Balance Sheet Policy Above the Effective Lower Bound, *Conference Proceedings, ECB Forum on Central Banking (Sintra)*,

Vissing-Jorgensen, A (2025). "Fluctuations in the Treasury General Account and their effect on the Fed's balance sheet," FEDS Notes. Washington: Board of Governors of the Federal Reserve System, https://doi.org/10.17016/2380-7172.3873.

Zobel, P (2022). "The Ample Reserves Framework and Balance Sheet Reduction: Perspective from the Open Market Desk", Remarks at the Cato Institute's 40th Annual Monetary Conference.

Table 1. Federal Reserve balance sheet, September 24, 2025

Source: H.4.1 release. Other assets includes unamortized premiums and discounts on securities held outright, other Federal Reserve assets, foreign currency denominated assets, gold stock, the special drawing rights certificate account, and Treasury currency outstanding. Other autonomous factors include the foreign repo pool (reverse repurchase agreements, foreign official and international accounts), Treasury cash holdings, foreign official deposits, other deposits. Other non-autonomous factors include the U.S. Treasury supplementary financing account, term deposits, Treasury contributions to credit facilities, and other liabilities and capital.

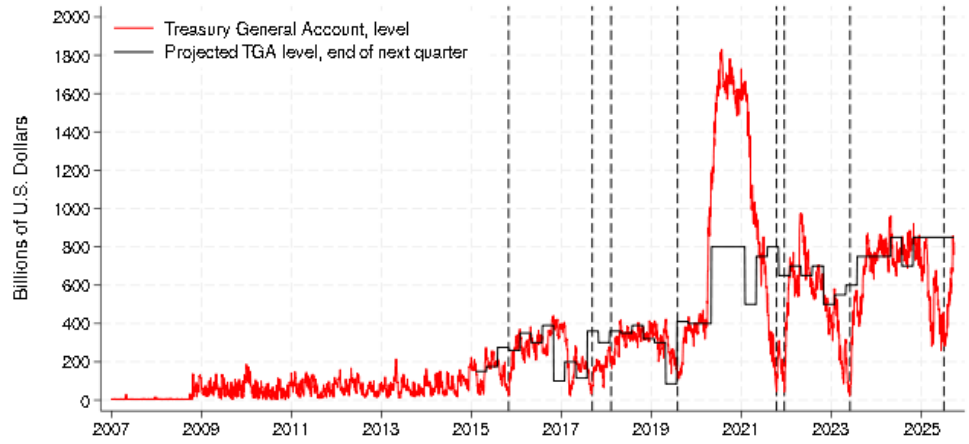
Assets		Liabilities	
Securities		Autonomous factors	
Treasuries	4,201	Currency	2,410
MBS (incl. agency debt)	2,102	Treasury general account	758
Lending		Other autonomous factors	652
Loans, repo and facilities	13	Reserves	3,000
Central bank liquidity swaps	0	Overnight reverse repo balances	29
Other	343	Other (not autonomous factors)	-189
	6,659		6,659

Figure 1. The Treasury General Account and its drivers

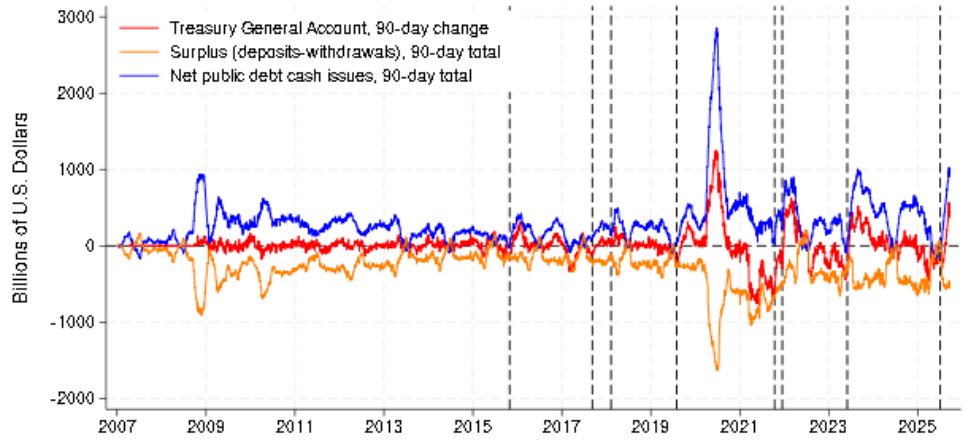
All panels are based on daily data for January 2, 2007 to September 24, 2025, obtained from the Daily Terasury Statement. Vertical dashed lines mark dates on which the debt ceiling was increased or suspended, focusing on the period from 2015 onwards (the dates, collected from a variety of sources, are Oct 30 2015, Sep 8 2017, Feb 9 2018, Aug 2 2019, Oct 14 2021, Dec 16 2021, Jun 3 2023, and Jul 4 2025).

Panel A. Treasury General Account balances, time series of level

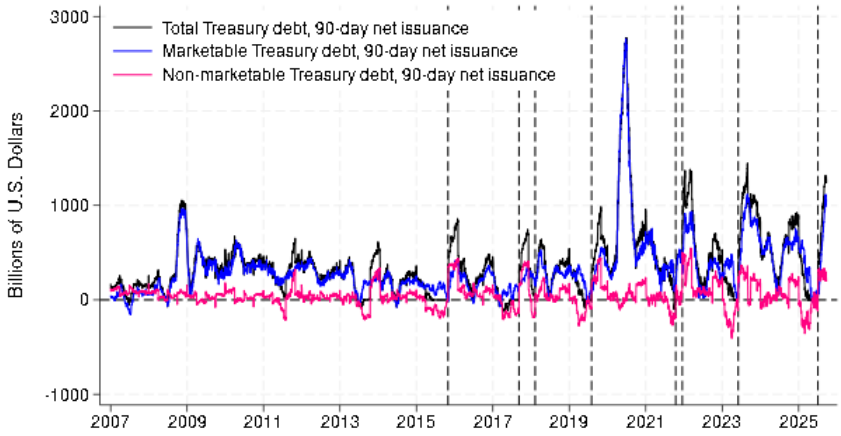
The black line shows the Treasury's projected value of the TGA at the end of the next quarter from the Treasury's Marketable Borrowing Estimates issued quarterly and focuses on the period from 2015 onwards.



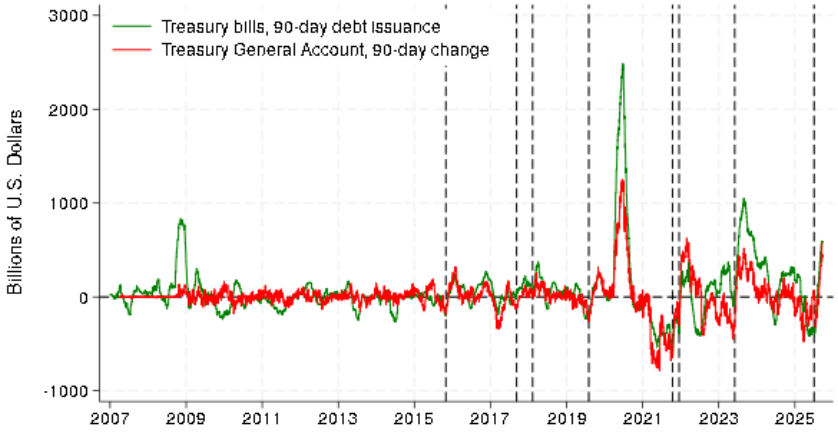
Panel B. Treasury General Account balance changes and their components, 90-day changes



Panel C. Components of total Treasury debt oustanding: Marketable and non-marketable debt



Panel D. Treasury General Account balances and Treasury bills outstanding, 90-day changes



Panel E. Components of marketable Treasury debt oustanding: Notes, bonds and bills

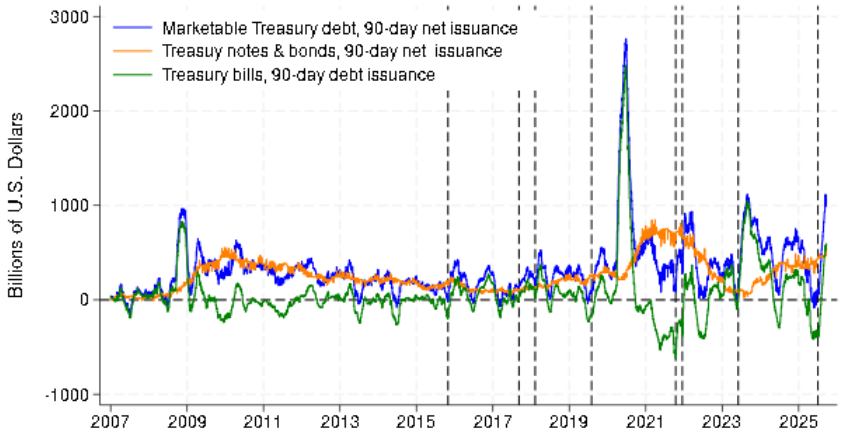
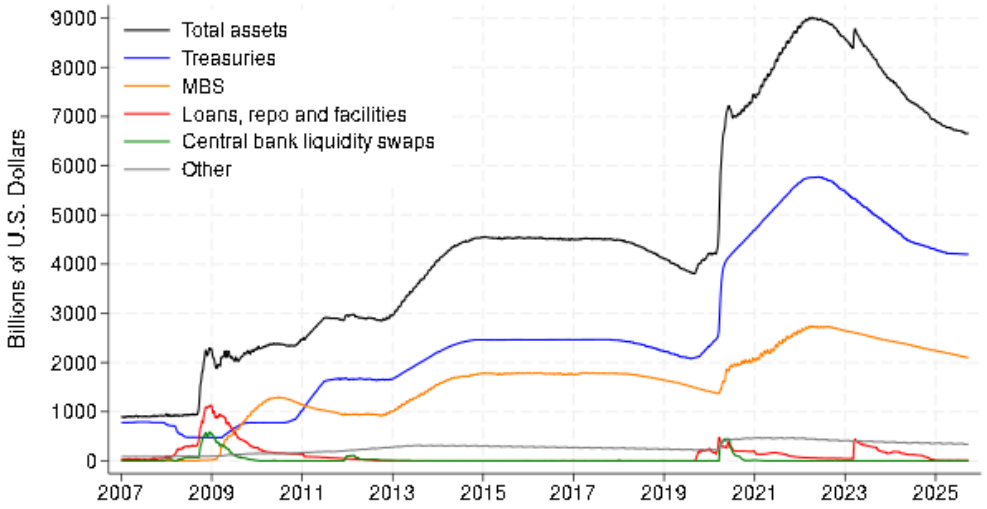


Figure 2. Federal Reserve asset and liabilities

Wednesday levels, January 3, 2007 to September 2024, 2025. Source: H.4.1 release via FRED.

Panel A. Total assets and asset categories



Panel B. Liability categories

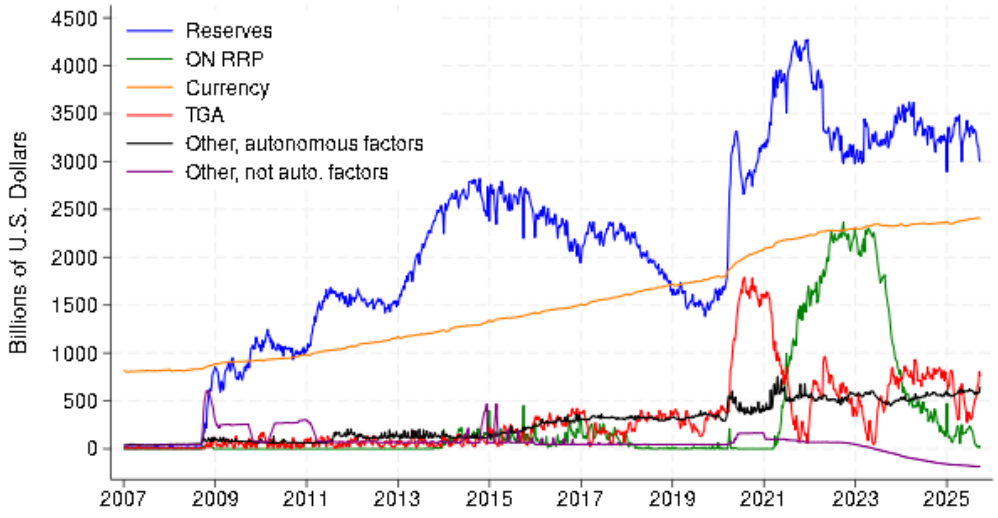
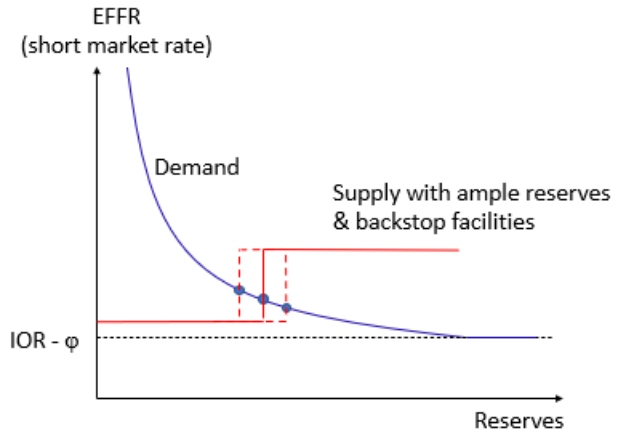


Figure 3. Effects of autonomous factor fluctuations on short market rates

Panel A. Effect of autonomous factor fluctuations in an ample reserves regime



Panel B. Managing autonomous factor fluctuations in an active securities regime

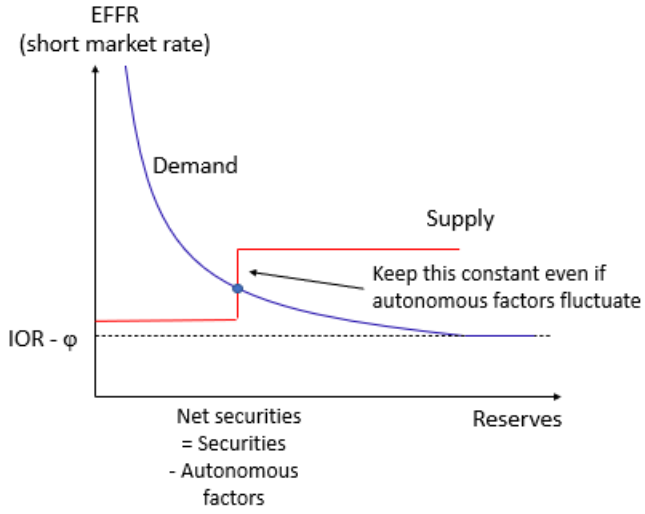


Figure 4. Reserves+ON RRP balances and their relation to the TGA, time series plot

13-week changes. Data are from the H.4.1 release, Wednesday levels. Sample: January 3, 2007 to September 24, 2025.

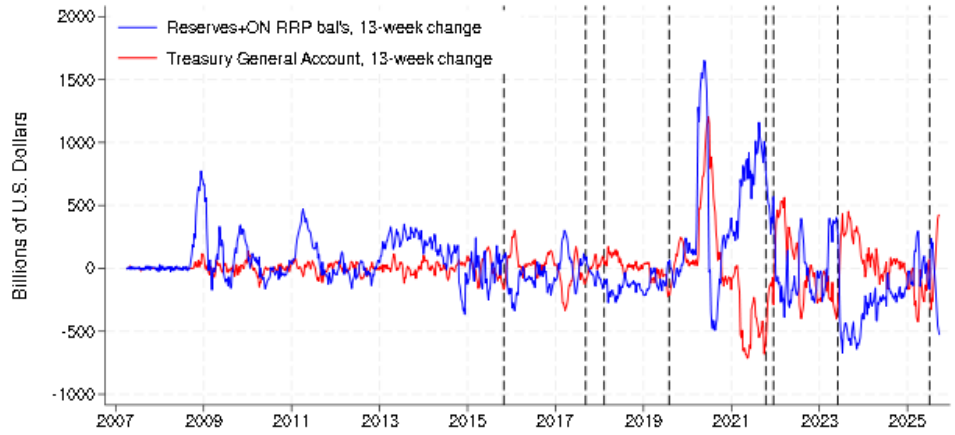


Figure 5. Hypothetical Fed balance sheet for money supply purposes with TGA backed with bills

Based on daily data, January 3, 2007 to September 24, 2025.

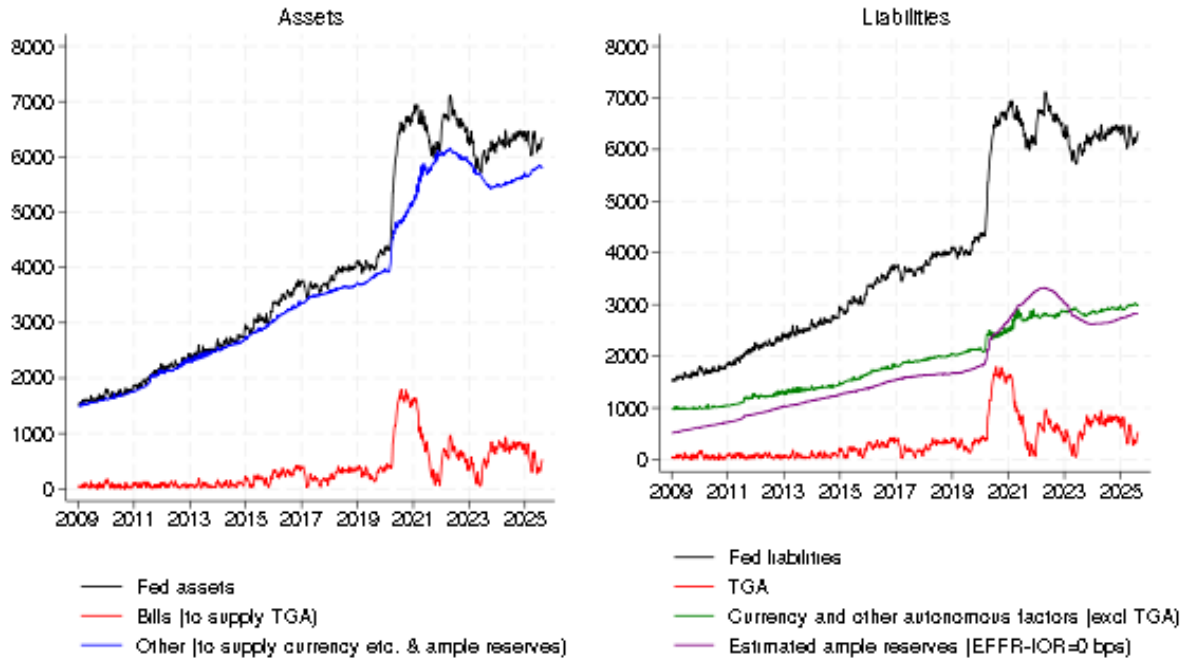


Figure 6. Yields on 1-month bills and the 1-month expected ON RRP rate

The figure shows the 1-month bill yield and the 1-month expected ON RRP rate, both expressed on an annualized basis. Vertical lines are at June 3, 2023 (debt limit suspended) and July 4, 2025 (debt limit increased). The 1-month bill yield is from FRED (I use the 4-week yield and express it on an investment basis). The 1-month expected ON RRP rate is calculated following Stein and Wallen (2025) as ON RRP rate(t)+[1-month OIS(t)-EFFR(t)], where the OIS is based on the effective fed funds rate and the term in square brackets thus measures the 1-month term premium. The ON RRP rate and EFFR are from FRED and the OIS from Bloomberg. Sample: January 3, 2023-September 3, 2025.

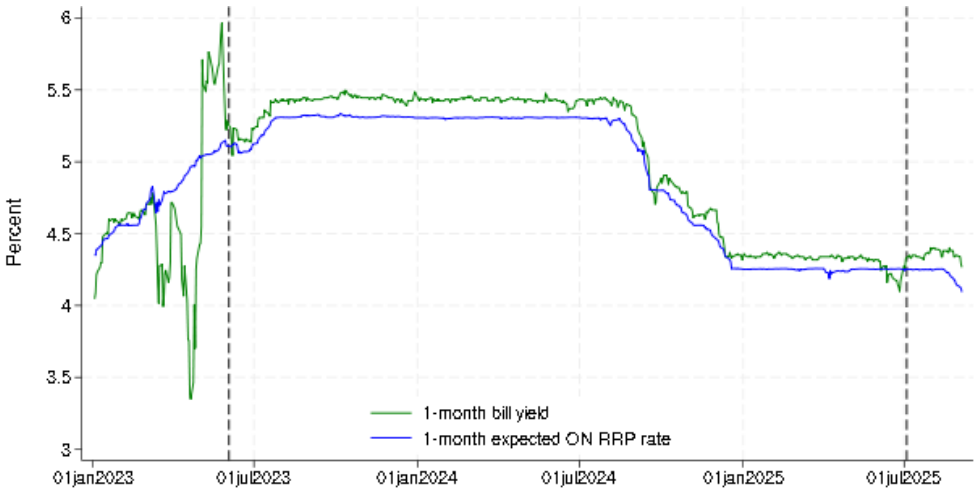
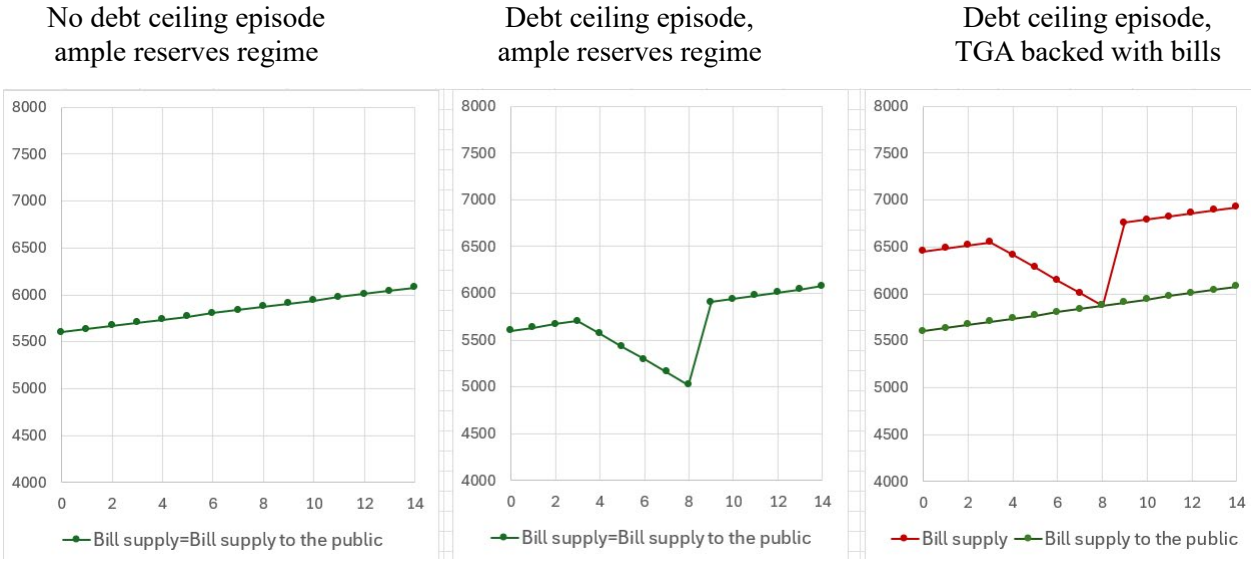


Figure 7. Hypothetical example of the evolution of quantities during a debt ceiling episode

In the example, the debt ceiling binds from date 3 and is increased or suspended on date 8. The TGA is rebuilt at date 9.

Panel A. The Fed's balance sheet

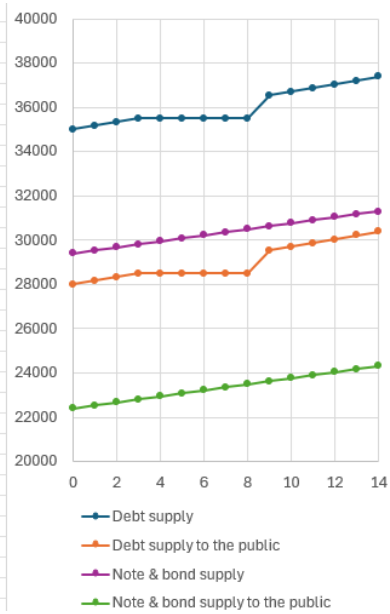
Panel B. Treasury bill supply



Panel C. Overall Treasury supply and note & bond supply

No debt ceiling episode
ample reserves regime

Debt ceiling episode,
ample reserves regime



Debt ceiling episode,
TGA backed with bills

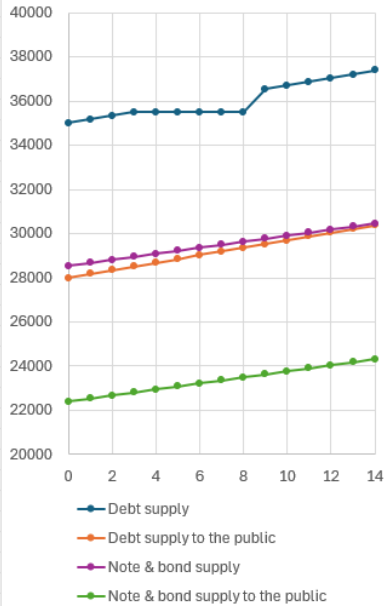
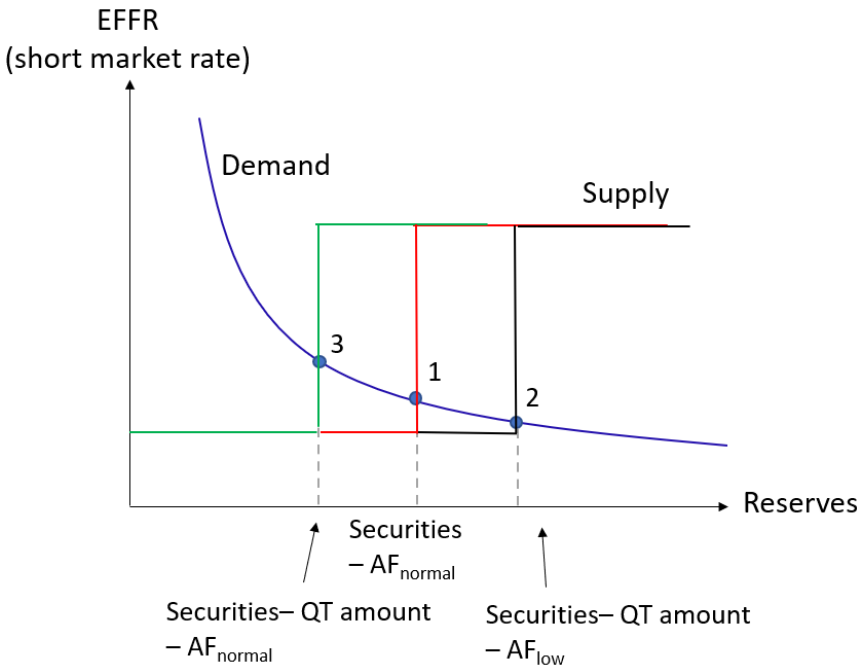


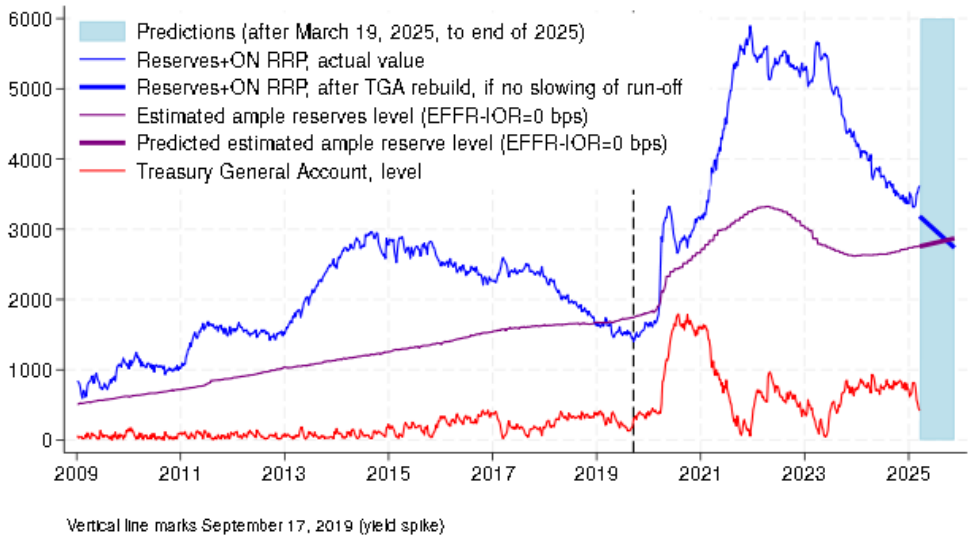
Figure 8. TGA fluctuations related to debt ceiling complicate quantitative tightening

Panel A. Effect of autonomous factor fluctuations during quantitative tightening in an ample reserves regime



"AF" denotes autonomous factors.

Panel B. Comparing Reserves + ON RRP balances to estimated ample reserve levels



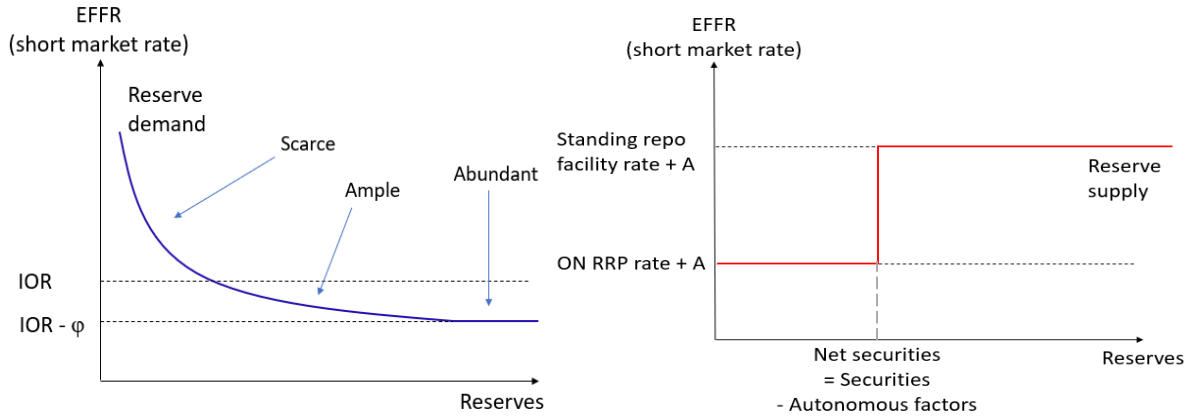
Internet Appendix. Reserve demand and reserve supply basics

This appendix provides a brief overview of reserve demand and supply based on Lopez-Salido and Vissing-Jorgensen (2025, henceforth LSVJ). The framework of LSVJ focuses on three drivers of a representative bank's demand for reserves at the Fed. First, reserves pay interest at the rate *IOR*, making them a useful store of value. Second, reserves have convenience benefits. Their liquidity is valuable because a bank that has sufficient reserves can make a payment (to a depositor withdrawing funds or to a borrower) without having to incur transactions costs selling illiquid assets and without payment delay. Convenience benefits may also stem from reserves use for supervision & regulation purposes (the liquidity coverage ratio, intraday liquidity requirements, etc.). LSVJ use $v(Reserves, Liquid\ Deposits)$ to denote the convenience value (the expected savings on transactions costs/regulatory costs from reserves given the level of liquid deposits). The first derivative with respect to reserves, $v'_R(Reserves, Liquid\ Deposits)$, is the marginal convenience value of additional reserves and is called the convenience yield. It is decreasing in reserves (as additional reserves as less and less valuable for managing a given amount of liquid deposits) and increasing in the amount of liquid deposits the bank has to manage. Third, banks face a marginal balance sheet cost φ per \$ of assets, related to capital requirements. These three features imply that the highest market rate, *r,* the bank is willing to pay to borrow to hold additional reserves is given by

$$\underbrace{r}_{\substack{\text{Highest rate bank is willing to pay}\\ \text{to borrow to hold additional reserves}}} = \underbrace{IOR + v'_R(Reserves, Deposits) - \varphi}_{\text{Net benefit of additional reserves}} \qquad \text{(A1)}$$

This first-order condition characterizes reserve demand, with the short market rate r (in practice, the effective federal funds rate) playing the role of the price. The figure below shows the resulting reserve demand function. The slope is negative because the convenience yield $v'_R(.)$ is declining in reserves. The level shifts up with the IOR and down with the balance sheet cost φ. The horizontal asymptote is $IOR - \varphi$.

Figure A1. Reserve demand and supply



Reserves are scarce in the sense that banks value them beyond the fact that they pay interest, if the net convenience yield $v_R'(.) - \varphi$ is positive. From equation (A1), $v_R'(.) - \varphi = r - IOR$, so scarce reserves correspond to the short market rate being above the IOR. Ample reserves refer to $v_R'(.) - \varphi \leq 0$ ($r - IOR \leq 0$) with $v_R'(.)$ still positive, while abundant reserves refers to reserves so large that the net convenience yield is zero, implying $v_R'(.) - \varphi = -\varphi$ and thus $r = IOR - \varphi$.

As for reserve supply, from the Fed's balance sheet

$$\text{Reserves} = \underbrace{\text{Net securities}}_{Securities-Autonomous\ factors} + \underbrace{\text{Lending}}_{\substack{Reserves\ borrowed \\ from\ the\ central\ bank}} - \underbrace{\text{ON RRP balances}}_{\substack{Reserves\ lent \\ to\ the\ central\ bank \\ by\ non-banks}} \quad \text{(A2)}$$

With no take-up at the Fed's lending facilities (the discount window and the Standing Repo Facility) or the Fed's ON RRP facility, reserve supply would equal the Fed's securities holdings minus the amount that is funded with the autonomous factors. LSVJ denote Securities-Autonomous factors "net securities". The vertical part of the reserve supply curve is given by the value of net securities. The Fed's lending facilities generate a top flat part of the reserve supply curve, as the Fed stands ready to supply additional reserves elastically at the interest rate on the facilities.[25] Conversely, the ON RRP facility generates a bottom flat part of the reserve supply curve, as the Fed stands ready to let reserve supply be reduced by (crowded out by) take-up at the ON RRP facility.

Three types of equilibria emerge. When reserve demand intersects supply on the vertical part of supply, the Fed's facilities are not used and ON RRP balances and lending balances are zero (top chart in Figure A2). Positive ON RRP balances emerge when reserve demand intersects reserve supply on the bottom flat part of the supply curve (middle chart in Figure A2). Net securities are then funded with a mix of reserves and ON RRP balances. The reduction in reserves ensures that the market rate clears at point 2 rather than point 1, thus keeping the market rate from falling below the floor. Positive lending emerges when reserve demand intersects reserve supply on the top flat part of the reserve supply curve (bottom chart in Figure A2). The additional lending created via financial institutions' borrowing implies market clearing at point 2 rather than point 1, thus keeping the market rate from exceeding the ceiling. These descriptions ignore any stigma in using the Fed's facilities. With stigma, mainly relevant for the lending facilities, the ceiling may in practice be higher than illustrated.

[25] There is a subtlety in that the EFFR is an uncollateralized rate which the Fed's lending and ON RRP facilities are collateralized. Denoting by *A* the spread between uncollateralized and collateralized interest rates, the upper flat part of the reserve supply curve is at the lending facility rate plus *A*. Similarly, bottom flat part of the reserve supply curve is at the ON RRP facility rate plus *A*. See LSVJ for details.

Figure A2. Types of reserve market equilibria