

Economic Brief

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The Fed's Evolving Involvement in the Repo Markets

Article by: [Huberto M. Ennis](#) and [Jeff Huther](#)

The Fed recently introduced a new monetary policy tool — the Standing Repo Facility — which complements the Overnight Reverse Repo program put in place in 2013. We provide an overview of the workings of these two initiatives and their effects on the repo market, with thoughts about the way they affect the dynamics of this critical segment of the financial system.

The financing of debt securities issued by the U.S. Treasury and by government-sponsored entities (GSEs) is a critical part of the global financial system. Lenders such as money market mutual funds (MMFs) treat these transactions as loans collateralized with high-quality securities. Borrowers such as securities dealers treat the transactions as simultaneous sales and commitments to repurchase the securities (most often, the next day). Hence, the name "[repurchase agreement](#)" or repo.

The vast majority of repo transactions are based on standardized contracts that allow participants to conduct trades quickly and efficiently, leading to a highly liquid market. In this *Economic Brief*, we explore the Fed's role in this market, focusing on the establishment of the two repo facilities and how they've changed the Fed's involvement in that market.

Repo Market Size and Operations

While the full size of the repo market is not precisely known, the Federal Reserve Bank of New York tallies a large share of the trades every business day and publishes the information in its [Markets Data Dashboard](#). These data help explain why the market for recently issued U.S. Treasury securities is so liquid: Reported financing transactions averaged nine times the average settlement of Treasury coupon auctions.¹

Most activity in the repo market each day cannot be delayed to future dates. Cash lenders (mainly MMFs) have limited alternatives for same-day investments. Cash borrowers such as securities dealers often purchase securities counting on obtaining the necessary funding in

the repo market. The resulting urgency to settle — present on both sides of the market — makes repo rates susceptible to changes throughout the day as the relative amounts of needed borrowing and lending evolve.

The Fed's Involvement in the Repo Market

The Fed has used repo transactions since the 1920s to manage the quantity of reserves held by commercial banks.² Initially, all 12 Reserve Banks conducted these transactions, but reserve management operations were eventually centralized at the New York Fed as the financial system became more efficient at reallocating reserves across the country.

In the following decades, the Fed refined its usage of repo operations, eventually making them the primary means of creating temporary changes to the stock of bank reserves. The Fed supplied reserves by entering into repo transactions in which it temporarily credited banks' reserve accounts in exchange for temporary holdings of Treasury securities. Through these "reserve injections," the Fed was able to influence the level and price of interbank credit as well as credit more broadly in the economy.

The Fed's response to the financial crisis of 2008 altered the stock and nature of bank reserves and the Fed's use of repos in two fundamental ways:

- The Fed's large scale asset purchases were funded to a large extent by the issuance of new reserves, making reserves extraordinarily abundant.
- The Fed used its ability to pay interest (IOR) as a way to make reserves an attractive form of short-term investment.

Through these changes, the supply of reserves was mainly driven by outright purchases of securities rather than repo transactions. Reserve requirements lost much of their relevance and recently have been set to zero.

Monetary Policy and the "Floor" System

When reserves are abundant, monetary policy can, in principle, be implemented via a "floor" system where the fed funds rate:

- Does not fall below the IOR, since lending banks will prefer to leave funds with the Fed
- Does not rise above the IOR, since banks have enough reserves without borrowing more

In theory, a floor system should be effective even though not all fed fund market participants have access to IOR. Whenever the fed funds rate moves lower than IOR, a simple arbitrage would put upward pressure on the fed funds rate as institutions with access to IOR compete to attract the funds of those that do not.

Some frictions interfere with the simple arbitrage logic. For example, capital and other regulations make expanding banks' balance sheets to undertake arbitrage costly. These costs create a wedge between IOR and fed fund rates. Furthermore, some institutions without access to IOR (such as the housing GSEs) have internal risk-management practices that limit their ability to engage in (concentrated) trading with certain counterparties, interfering with competitive forces and arbitrage. When arbitrage does not work effectively, the "floor" can become "soggy" and, in extreme cases, could weaken interest rate control.

The Overnight Reverse Repo Program

The changes that resulted from the financial crisis removed the need for the Fed to engage in daily reserve management and, by extension, the need for the Fed to actively participate in the repo market for that purpose.

As the stock of reserves grew, however, it became clear that the abundance of reserves — combined with limits to arbitrage — could push the fed funds rate below the bottom of the Fed's target range. To reduce the likelihood of below-target rates, the Fed introduced programmatic repo transactions with a wide range of financial firms in 2013. This program — the Overnight Reverse Repo Program (ON RRP) — allows eligible counterparties to lend excess funds to the Fed through repo transactions at a specified rate, ensuring that repo rates (and other short-term money market rates, by extension) remain close to or above the ON RRP rate.

The ON RRP facility has been effective in helping maintain control of the fed funds rate well within the target policy range. More recently, however, one of the ON RRP's primary uses has been to absorb funds that would otherwise end up as reserves on bank balance sheets, with the Fed effectively becoming the largest borrower in the repo market, as seen in Figure 1.

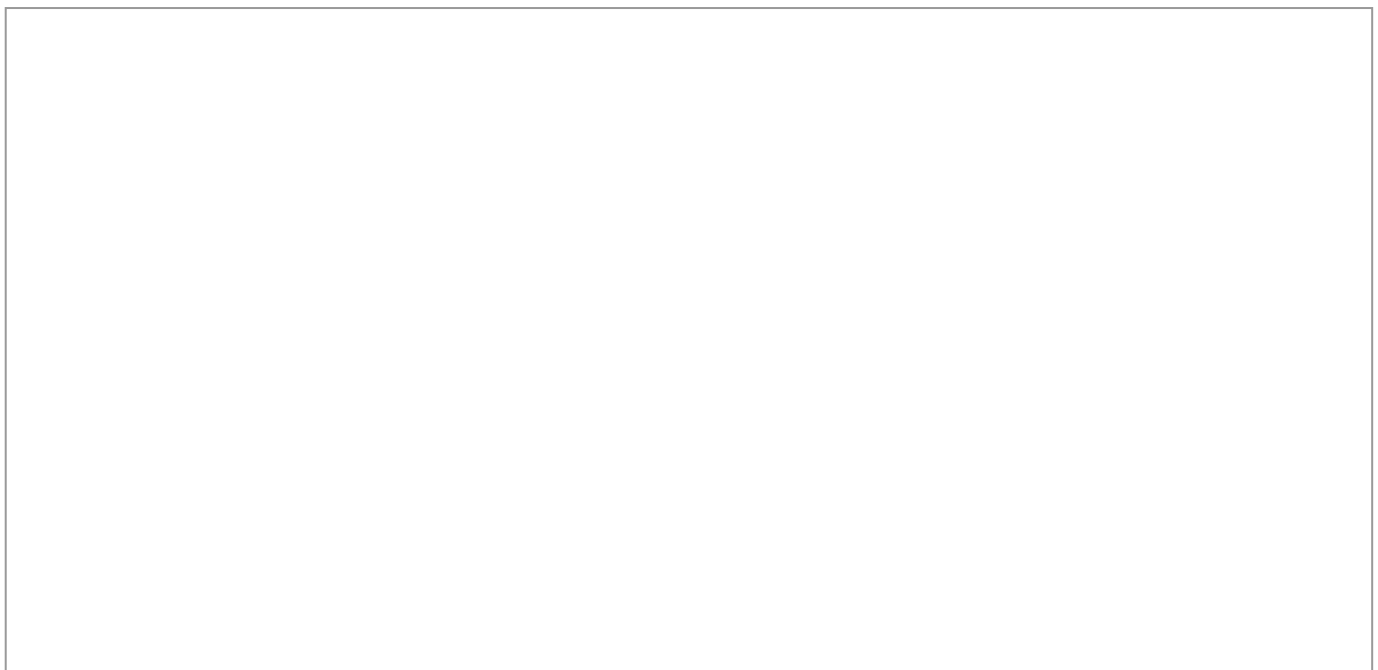
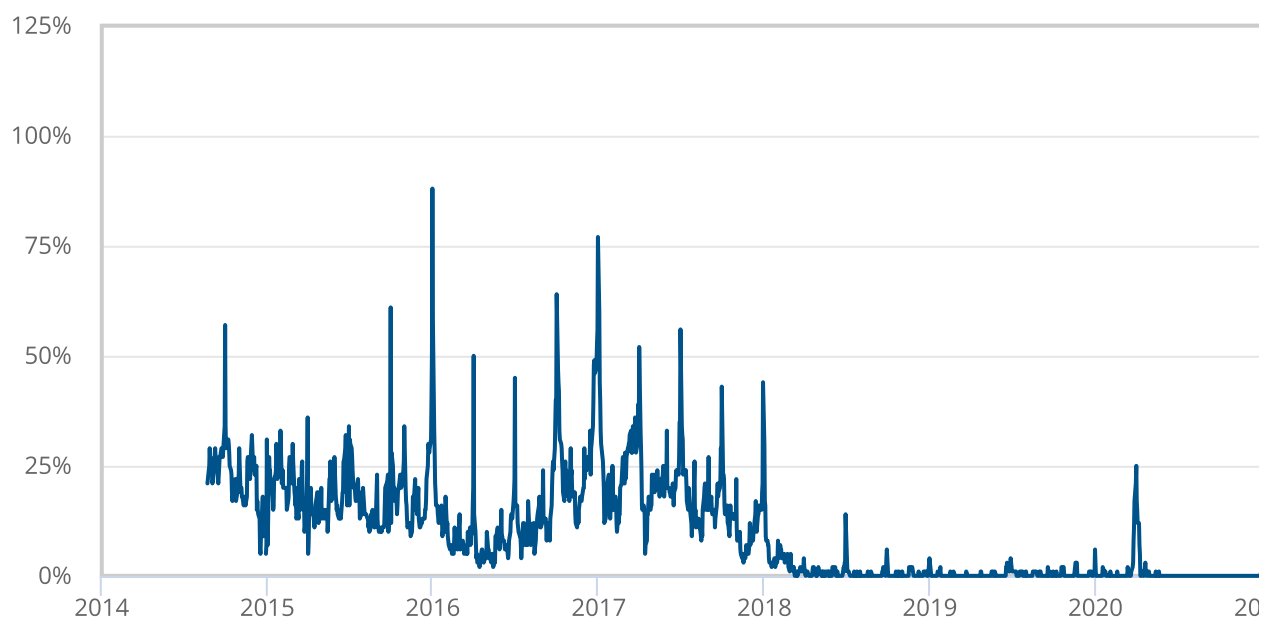


Figure 1: Overnight Reverse Repo Program as a Percentage of Reported Repo Volumes



Source: Federal Reserve Board of Governors and authors' calculations.

An important shift linked to the ON RRP is that the Fed now directly interacts with a much broader set of institutions in the repo market. Traditionally, primary dealers were the only admissible counterparties in open market operations. Access to the ON RRP, however, has been extended to banks, GSEs and other qualified financial institutions. Through this expansion, MMFs have become the main repo counterparty.³

While it can be attractive to MMFs, the ON RRP interest rate has been set lower than the IOR that banks earn, making the participation in the program uneconomical for banks. An important consequence of this relative pricing is that the stock of bank reserves is now heavily influenced by flows in and out of MMFs.

Interest Rate Pressures and the Fed's Standing Repo Facility

In mid-September 2019, the repo market experienced a brief episode of extreme volatility.⁴ At the time, the level of reserves had been decreasing due to policy normalization. Several factors led to a greater than anticipated need to borrow in the repo market and to less available funding:

- A large amount of Treasury securities coming to the market
- MMF uncertainty about outflows for tax payments
- Balance sheet constraints of some large banks

Policymakers became concerned that sharp increases in the repo rate might spill over to the fed funds rate, compromising interest rate control and monetary policy implementation.

The Fed responded to the September 2019 market pressures with daily open market operations in the repo market to quickly increase funding available in money markets. These repo operations relied on the same mechanisms and set of counterparties (primary dealers) as used in the Fed's traditional open market operations, but worked in the opposite direction of the ON RRP, providing cash rather than absorbing it.

After market conditions returned to normal in the second half of September 2019, the daily repo operations continued to be offered (without takeup) until March 2020. Then, the COVID-19 crisis led to significant stress in Treasury and short-term funding markets, and the Fed's daily repo operations helped mitigate this stress by providing large amounts of liquidity in a brief period of time. The quantity of reserves in the system rose very quickly also as a result of the Fed's large-scale asset purchases. By the end of June 2020, market participants became more confident of their assessments of the pandemic effects, and demand for Fed repo operations fell back to zero.

To mitigate interest rate pressures — like those in September 2019 and March 2020 — the Fed established a Standing Repo Facility (SRF) in July 2021. The SRF is intended to provide a "backstop" for the market.⁵ That is, the facility offers cash in the repo market at an interest rate that is slightly above the prevailing market rates, making it unattractive for most market participants during normal times. In times of market stress, however, market participants now know that they (or their counterparties) can turn to the SRF for funding. Knowledge that an *immediately available* backstop is in place will help to guide expectations of how interest rates in the repo market will behave in periods of high market uncertainty.⁶

The Fed's Standing Facilities: Further Considerations

A Corridor for Repo Interest Rates

The combination of the ON RRP and the SRF creates a "corridor" for repo market interest rates that should be effective regardless of the stock of reserves:

- Repo rates should not fall below the ON RRP rate because lenders can turn to the Fed if private sector borrowers are unwilling to pay a comparable rate.
- They should not rise above the SRF rate because borrowers have an alternative if lenders demand a higher rate.⁷

In practice, repo rates differ for multiple reasons, and some trades may happen outside the corridor range for rates even in a well-designed system.

Prior to the financial crisis, Fed open market operations in the repo market were conducted with the goal of keeping interest rates in the fed funds market near or at the FOMC's target rate, relying on market participants to reallocate injected reserves to banks that needed them. The ON RRP differs operationally from this approach but uses the same repo infrastructure to help keep the fed funds rate from falling to the bottom of what is now a target *range*. The expectation is that the SRF will play a similar role on the "ceiling" side when reserves are lower and will complement the Fed's discount window, which traditionally was intended to provide a ceiling on interbank transactions.⁸

Many banks fear that borrowing from the discount window will be perceived as a sign of distress. Thus, they avoid the discount window even when the interest rate is attractive to them. The design of the SRF may allow it to overcome this limitation and provide liquidity to banks through the repo market. The SRF will also give *all* (not just bank-affiliated) primary dealers direct access to Fed funding.

Collateral

An important difference between the SRF and the discount window is the collateral requirements. At the discount window, banks pledge a broad range of assets (including loans and various securities) from their balance sheets as collateral. Those pledges allow the discount window to be able to provide liquidity to (effectively) all eligible depository institutions with immediate unexpected needs.

In contrast to the broad collateral accepted at the discount window, the SRF takes only Treasuries and agency securities as collateral. If the main objective of the facility is to provide a more effective ceiling for fed funds rates, then this narrow definition of acceptable collateral likely could work appropriately. Arguably, under such limited objective, the SRF could even be restricted to accept only Treasuries as collateral, since most large U.S. commercial banks have significant holdings of Treasuries in their portfolios.

Usage in Both Stressed and Calm Periods

To determine who receives funding, the SRF uses an auction with a total maximum amount of allotted funds (a cap). Paradoxically, SRF lending may decline in times of stress. If borrowers see the aggregate cap as potentially binding, they are unlikely to wait until the operation (which is late in the repo market trading day) to find out if they can obtain funding from the Fed. The cost of funding after the SRF operation is likely to be very high for auction losers. Independent of market stress, the risks of not receiving funding make it possible that — at times when usage approaches the aggregate cap — facility interest rates rise as borrowers compete for funds. It is worth noting here that the Fed could adjust the cap in response to market conditions deteriorating.

With the ON RRP, the Fed could become the preferred borrower for many investors during periods of financial stress, abruptly depriving regular repo market participants of funding when that funding may be particularly important. Such flows could be exacerbated by lenders' knowledge that their usual counterparties can turn to the SRF for funding. That is, the Fed could be both the favored borrower and favored lender when financial uncertainty is high. These concerns were raised initially at the time of the ON RRP creation and continue to be an important consideration.⁹

Even in periods with calm financial markets, the SRF could become heavily used once the Fed begins balance sheet normalization. Higher money market rates — relative to the facility's interest rate — could lead the SRF to become the preferred vehicle for funding Treasury and agency securities.¹⁰ This is a non-trivial risk given the historical range of repo rates: The median spread between high and low published repo rates between April 2018 and August 2021 is 17 basis points while the spread between the ON RRP rate and the SRF rate is 25 basis points. To the extent that some of the high rates paid in the market reflect credit and other risks, SRF usage could raise moral hazard concerns.

Ideally, in a corridor system, the facilities that provide the rate floor and ceiling act mainly as backstops without being heavily used. However, when the quantity of reserves fluctuates considerably, the facilities may become a vehicle for reserves management as well as rate control.

The recent surge in ON RRP usage could be interpreted in this way. When outstanding reserves in the system are large, current capital regulations make it costly for banks to hold those reserves. As banks' balance-sheet costs become significant, banks encourage investors to move their cash to institutions less constrained by regulation, such as MMFs. That is, the current ON RRP is absorbing cash that would otherwise become reserves at capital-constrained banks.¹¹

As with other market intervention by the Fed, large participation in its repo programs raises "footprint" concerns. A large and persistent Fed presence in markets may alter trading patterns, established relationships and even technological innovation in unexpected ways and may create unintended and undesirable consequences.¹² These risks have led the Fed to generally take a cautious approach to facility design.

What Fed Facilities Will Not Achieve

With a free flow of funds, arbitrage opportunities should ensure that the Fed's borrowing and lending rates provide a floor and ceiling for repo rates. We have already noted, however, that not all repo market participants are counterparties to the Fed. That and other factors can limit the facilities' effectiveness in keeping repo rates within the corridor. Briefly, these factors include timing, relationships, counterparty limits, balance sheet constraints and netting.

Timing

The Fed participates in the repo market through a part of the market that settles transactions in the late afternoon. Some market participants need their cash or securities returned earlier in the day, and those participants may be willing to pay extra for that early return.

In contrast to settlement, the Fed's pricing and allocation in repo operations occur in the early afternoon. While these operations are conducted after most repo market trading, there are late-day needs that cannot fall back to the Fed. Those transactions, if not anticipated, can create significant price pressures in the market.

Relationships

Because of the repetitive nature of the repo market — most borrowers and most lenders participate every day — counterparties that reliably provide cash or securities are highly valued. To maintain these relationships, borrowers and lenders are willing to accept (for a limited time) below or above market rates to ensure continued access to their counterparties.

Counterparty Limits

Lenders generally have a limited number of counterparties that they have vetted for credit risk. Even with Treasury securities as collateral, lenders limit their exposure to individual borrowers for regulatory and internal risk management reasons. As a result, lenders may be unwilling or unable to extend credit despite attractive arbitrage opportunities.

Liquidity Requirements and Balance Sheet Constraints

Following the 2008 financial crisis, Congress passed legislation designed in part to increase and maintain a high level of bank liquidity and capital, particularly for large banks. The need for regulatory capital can make it costly for large banks to expand their balance sheets, particularly in response to short-term price disruptions. As a result, large temporary imbalances in money markets are unlikely to be fully resolved by banks with access to Fed facilities even for apparently profitable trades.¹³

Netting

Balance sheet constraints make *netting* especially attractive to large banks: Banks that borrow and lend to the same counterparty with the same types of collateral may be able to report the net exposure for regulatory and accounting purposes. While bank borrowing and lending of the same securities on the same day may seem unlikely, it is common in the repo market since much of the trading is centrally cleared, with the clearing house as the counterparty in both sides of the trades.

Large financial institutions use repos for a wide range of activities, which generate borrowing and lending during the day and create netting opportunities in those trades centrally cleared. Given balance sheet costs, intermediating banks may offer concessionary rates to reduce their balance sheet costs through netting.

Conclusion

While the Fed has been an active participant in the repo market almost since its inception, the ON RRP and SRF differ from older open market operations in two important dimensions. With the older style of monetary policy implementation, the Fed's borrowing and lending costs were largely based on market conditions at the time of operations, and the amount of borrowing or lending by the Fed was determined by the Fed itself. The ON RRP and the SRF flip the parameters of the Fed's engagement in the market: The Fed sets the prices, and market participants determine the amounts.

The differences are non-trivial:

- The Fed's balance sheet size and composition can be influenced by the size of non-bank financial institutions.
- The stability of repo rates may encourage leveraged market participants to expand their positions.
- The Fed's balance sheet may substitute for private sector intermediaries.
- Financial market participants that are not Fed counterparties may find themselves disadvantaged in other markets.

The facilities will likely create greater price certainty, possibly benefiting providers of collateral in the repo market, as investors will have greater confidence about the predictability of their financing costs.

Offsetting these potential benefits, however, is the risk that Fed intervention is muting valuable market signals that could enhance economic efficiency and stability. It is possible, for example, that small imbalances fester unaddressed or undetected until some event leads supply or demand factors to push beyond the capabilities of the facilities to contain them, creating sharp reactions in financial market. This, in turn, could threaten financial stability.

In this note, we have mainly focused on how the Fed's new repo tools interact with market forces. We set aside the broader questions that the tools may raise about the evolving engagement of the Fed with financial markets. This evolution is partly driven by the growth of non-bank financial institutions, which are playing an increasing role in short-term money markets and more broadly in the stability (or lack thereof) of the U.S. and global financial system.

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Huberto M. Ennis is group vice president for macro and financial economics in the Research Department at the Federal Reserve Bank of Richmond. Jeff Huther is senior project manager for LIBOR Transition at the Federal Reserve Board of Governors.

¹ *Treasury and repo market volumes for the first half of 2021. While the Treasury market is very large, most securities are held by long-term investors. Those investors typically buy Treasuries in the secondary market well after they have been issued. Many participants in Treasury auctions rely on the repo market to finance their transactions.*

² *In 2020, due to the pandemic fallout, U.S. banking regulators suspended the inclusion of bank reserves and bank Treasury holdings in the calculation of leverage ratio requirements. The suspension expired in March 2021, but the status of the regulation is currently under review.*

³ *See, for example, the 2015 paper "Rewriting Monetary Policy 101: What's the Fed's Preferred Post-Crisis Approach to Raising Interest Rates?" by Jane Ihrig, Ellen Meade and Gretchen Weinbach and the 2018 paper "Monetary Policy Implementation and Financial Vulnerability: Evidence From the Overnight Reverse Repurchase Facility" by Alyssa Anderson and John Kandrac.*

⁴ *See, for example, the 2021 article "Reserves Were Not So Ample After All" by Adam Copeland, Darrell Duffie and Yilin (David) Yang.*

⁵ *For a detailed account of the Fed's historical role in the Treasury and repo markets, see Kenneth D. Garbade's book After the Accord: A History of Federal Reserve Open Market Operations, the US Government Securities Market, and Treasury Debt Management from 1951 to 1979.*

⁶ *MMFs do not have accounts with the Fed and, hence, are not able to directly access IOR. Most MMFs, however, can invest in the repo market, so the ON RRP allows the Fed to borrow from and pay interest to MMFs.*

⁷ *See the 2020 paper "What Happened in Money Markets in September 2019?" by Sriya Anbil, Alyssa Anderson and Zeynep Senyuz and the 2020 paper "The Market Events of Mid-September 2019" by Gara Afonso and co-authors.*

⁸ *For a detailed discussion of the role of facilities as backstops, see Sam Schulhofer-Wohl's 2020 article "The Influence and Limits of Central Bank Backstops."*

⁹ *The extent of spillovers from the repo market into the fed funds market is hard to quantify. The spillover observed in mid-September 2019 seems quite limited. While repo rates experienced premia of 5 percent or higher, the fed funds rate only deviated by 5 basis points from the policy range. The incidence of spillovers, of course, depends on expectations and the policy actions triggered by them. For this reason, the observed outcomes are often inconclusive.*

¹⁰ *Both facilities have limits on the size of participation, so there is a risk that demand exceeds supply. However, these caps are relatively high, and widely binding caps could be met with additional Fed intervention if warranted.*

¹¹ For a detailed discussion of the role of the discount window in the process of monetary policy implementation, see my (Huberto's) 2016 article — co-authored with John Weinberg — "[The Role of Central Bank Lending in the Conduct of Monetary Policy.](#)"

¹² For a thorough discussion of these and other issues related to the structure of the ON RRP, see the 2015 article "[Overnight RRP Operations as a Monetary Policy Tool: Some Design Considerations](#)" by Josh Frost and co-authors.

¹³ An early argument in favor of the creation of an SRF was to encourage banks to reduce their reserve holdings by making Treasury securities a better substitute for cash. Since the SRF would allow banks to quickly convert their holdings of Treasuries into cash via a repo transaction, banks would be willing to reduce their holdings of reserves without putting excessive upward pressure on rates. This way, the Fed could target a smaller balance sheet. For a discussion of this argument, see the 2019 article "[Why the Fed Should Create a Standing Repo Facility](#)" by David Andolfatto and Jane Ihrig.

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