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OF  
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2022



# OPEN MARKET OPERATIONS

DURING 2021

A Report Prepared for the Federal Open Market Committee by  
the Markets Group of the Federal Reserve Bank of New York



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This report, presented to the Federal Open Market Committee by Lorie Logan, Executive Vice President, Federal Reserve Bank of New York, and Manager of the System Open Market Account, describes open market operations of the Federal Reserve System for the calendar year 2021. This report also describes the Federal Reserve emergency credit and liquidity facilities. Andrew Danzig, Halim Abourachid, Karen Brifu, Kathryn Chen, Radhika Mithal, Julie Remache, and Lisa Stowe were primarily responsible for preparation of the report.

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# OVERVIEW

## KEY DEVELOPMENTS IN 2021

During 2021, the U.S. economy continued to recover from the financial and economic shock created by the COVID-19 pandemic. Throughout the year, the Federal Open Market Committee (FOMC or Committee) maintained the target range for the federal funds rate between zero and ¼ percent. The FOMC continued to direct the Open Market Trading Desk at the Federal Reserve Bank of New York (the Desk) to conduct operations to maintain the federal funds rate in this target range.

For most of the year, the FOMC maintained its established pace of net asset purchases. Through its September meeting, the Committee directed the Desk to increase SOMA holdings of Treasury securities by \$80 billion per month and agency mortgage-backed securities (MBS) by \$40 billion per month. However, in November, in light of the substantial further progress the economy had made toward the FOMC's goals since December 2020, the FOMC announced plans to slow the pace of net Treasury and agency MBS purchases by \$10 billion per month and \$5 billion per month, respectively. And at its December meeting, the FOMC decided to double the pace of reductions in monthly net asset purchases beginning in January 2022, in light of inflation developments and further improvement in the labor market.

The FOMC also directed the Desk throughout the year to increase holdings of Treasury securities and agency MBS by additional amounts and until November to purchase agency commercial mortgage-backed securities (CMBS) as needed to sustain smooth functioning of markets for these securities. Indicators of market functioning were stable and the Desk did not increase holdings in excess of the

monthly amounts directed by the Committee. In March, the Desk ceased conducting regularly scheduled operations to purchase agency CMBS.

Asset purchases were the main driver of a \$1.40 trillion increase in the balance sheet over the year. At the end of 2021, the Federal Reserve's balance sheet measured \$8.76 trillion, or 38 percent of nominal GDP, compared to 34 percent of GDP at year-end 2020. The growth in Federal Reserve assets was funded primarily by growth in bank reserves and overnight reverse repurchase agreements (ON RRP), both of which reached record levels during the year. Reserves grew from \$2.99 trillion to an average of \$4.17 trillion in December, and the ON RRP increased from a near-zero balance to an average of \$1.60 trillion during December. Over the course of the year, the drawdown of the Treasury General Account (TGA) by \$1.32 trillion to \$406 billion, amid disbursements of fiscal stimulus payments and debt ceiling constraints, also contributed to the increases in reserves and other liabilities.

Even as liquidity in the system continued to rise during the year, the FOMC's ample reserves operating framework remained effective at controlling the federal funds rate and other overnight interest rates. During the first half of the year, the rise in reserves and overall liquidity, coupled with a significant decline in Treasury bill supply, resulted in some downward pressure on overnight rates, and in June, the Federal Reserve announced upward technical adjustments of 5 basis points to the rate of interest on excess reserves (IOER) and the ON RRP rate, to foster trading in the federal funds market at rates well within the FOMC's target range and to support the smooth functioning of short-term funding markets.<sup>1</sup>

### OPEN MARKET OPERATIONS DURING 2021

Over the year, significant use of the ON RRP facility helped maintain control over the federal funds rate and broadened the base of Federal Reserve liabilities supporting asset purchases, relieving upward pressure on bank balance sheets from growth in reserves. In order to ensure that the ON RRP facility continued to support effective policy implementation, the FOMC increased the ON RRP counterparty limit from \$30 billion to \$80 billion in March, and from \$80 billion to \$160 billion in September. Over the course of the year, the Federal Reserve Bank of New York (New York Fed) also announced adjustments to the counterparty eligibility requirements to make the ON RRP facility more accessible, in line with broader efforts to ensure that counterparty policies support effective policy implementation and promote a fair and competitive marketplace.

In July, the FOMC augmented the tools used to implement its ample reserves framework by establishing two standing repurchase agreement (repo) facilities to serve as backstops in money markets to support the effective implementation of monetary policy and smooth market functioning. The standing repurchase agreement facility (SRF) is intended to address unexpected pressures that can occasionally arise in overnight funding markets and spill over to the federal funds market. The standing foreign and international monetary authorities (FIMA) repo facility, which succeeds the temporary FIMA repo facility, provides a backstop source of temporary U.S. dollar liquidity to approved FIMA account holders in times of stress in global funding markets that could affect financial market conditions in the United States.

Global U.S. dollar funding markets remained stable throughout the year, which resulted in limited demand from foreign central banks to tap the Federal Reserve's liquidity arrangements that were available to them. The standing dollar liquidity swap lines between the Federal Reserve and five other major central banks saw minimal usage, as did the temporary dollar liquidity swap lines between the Federal Reserve and nine additional central banks. The latter arrangements expired at the end of the year. The temporary FIMA repurchase agreement facility and the subsequently introduced standing FIMA repo facility also experienced minimal take-up. For a chronology of policy announcements, see the "Timeline of Select Policy Actions during 2021."

Amid generally well-functioning financial markets, the outstanding balances on the emergency credit and liquidity facilities all declined in 2021. These facilities had been established in 2020 with the approval of the Secretary of the Treasury in response to financial disruptions related to the COVID-19 pandemic. In June 2021, the Federal Reserve announced that the Secondary Market Corporate Credit Facility (SMCCF) would begin selling its holdings of corporate bond exchange-traded funds (ETFs) and corporate bonds in a gradual and orderly manner. The sales were completed at the end of August with minimal market impact. The other emergency facilities either wound down fully in 2021 or will close out after their remaining assets mature in the next several years.

In 2021, the Federal Reserve remitted \$109.0 billion to the U.S. Treasury, compared to \$86.9 billion in 2020, primarily reflecting earnings from larger SOMA holdings. The domestic portfolio ended the year in an unrealized gain position of \$128 billion, compared to an unrealized gain position of \$354 billion at the end of 2020, as market yields increased over the year.

The Desk did not conduct any foreign exchange intervention activity that would alter the size of the SOMA foreign currency reserve portfolio, which at the end of the year totaled \$20.3 billion. The Desk continued to manage the SOMA foreign currency reserve holdings in line with the portfolio's investment objectives of liquidity, safety, and return.

In coming years, the size and composition of the SOMA domestic securities portfolio will depend on FOMC decisions regarding the pace of runoff, reinvestment policies, and judgments about the level of reserves consistent with an ample reserves regime. Staff projections, which reflect information released by the FOMC regarding its plans to reduce the size of the balance sheet, show the portfolio declining in size for several years, then remaining steady through reinvestments for some time, and finally resuming growth to match the growth in Federal Reserve liabilities. Over time, portfolio holdings begin to shift toward Treasury securities, consistent with the FOMC's intention to return to a portfolio composed primarily of Treasury securities. With interest rates assumed to increase from current levels,

## OPEN MARKET OPERATIONS DURING 2021

the projections suggest that SOMA net income could decline in coming years, due to the increased cost of interest-bearing Federal Reserve liabilities, and that unrealized losses on the portfolio could increase. Additional scenarios that consider alternate interest rate paths show that net income could be higher or lower than the projected baseline path and that net income could turn negative for a period of time. Importantly, the SOMA portfolio's income or its unrealized gains or losses have no effect on the ability of the Federal Reserve to meet its financial obligations or to conduct monetary policy to meet its statutory goals of maximum employment and price stability.

Operational resilience remained a high priority throughout 2021. The New York Fed continued to strengthen its operational flexibility and cyber and geographic resilience. The Desk also continued its practice of undertaking small-value exercises

with counterparties in order to maintain its readiness to implement a range of potential FOMC directives. The Desk broadened the base of counterparties for certain SOMA transactions, including the ON RRP facility, agency CMBS operations, and the SRF. In addition, the New York Fed further diversified its counterparties for certain emergency credit and liquidity facilities.

The Federal Reserve continued to engage with other authorities and private-sector parties on initiatives that support structural improvements to market functioning and promote financial stability, including efforts to enhance Treasury market functioning and to facilitate the transition away from LIBOR. (See **Box 1**, “Interagency Work on Treasury Market Resiliency,” page 17, and **Box 2**, “Industry Transition Away from USD LIBOR and Toward SOFR,” page 53.)

## OPEN MARKET OPERATIONS DURING 2021

## TIMELINE OF SELECT POLICY ACTIONS DURING 2021

Target Range for the Federal Funds Rate, IOER, ON RRP

Repo, Central Bank Liquidity Swaps, FIMA Repo Facility

Primary Credit Program, Emergency Facilities

Treasury Security and Agency MBS Purchases

**January 8**

Authorization for MSLP expires.

**March 8**

Board of Governors extends PPPLF by three months to June 30.

Board confirms CPFF, MMLF, and PDCF will expire March 31.

**March 17**

FOMC increases ON RRP counterparty limit from \$30 billion to \$80 billion.

Desk announces it will no longer conduct regular operations to purchase agency CMBS. The last scheduled operation to occur March 23.

**March 31**

Authorizations for CPFF, MMLF, and PDCF expire.

**April 30**

New York Fed adjusts ON RRP counterparty requirements by eliminating minimum thresholds for GSEs and reducing net asset value and reverse repo balance thresholds for MMFs.

**June 2**

Board announces plan to begin wind-down of SMCCF portfolio.

Board announces its approval of the final rule amending Regulation D to eliminate references to IORR and IOER and replace them with single IORB rate effective July 29.

**June 16**

Board increases IOER rate from 10 basis points to 15 basis points. FOMC increases ON RRP offering rate from zero to 5 basis points.

Federal Reserve extends temporary U.S. dollar liquidity swap arrangements with nine foreign central banks until December 31.

**June 25**

Board extends PPPLF by an additional month until July 30.

**July 28**

FOMC announces the establishment of the SRF with minimum bid rate of 25 basis points and aggregate operation limit of \$500 billion.

Federal Reserve announces the establishment of the standing FIMA repo facility with initial rate of 25 basis points and per counterparty limit of \$60 billion.

**July 29**

Amendment to Regulation D becomes effective; IORR and IOER replaced by IORB.

**July 30**

Authorization for PPPLF expires.

**September 22**

FOMC increases ON RRP counterparty limit from \$80 billion to \$160 billion.

**November 3**

FOMC directs Desk to reduce monthly purchases of agency MBS by \$5 billion and of Treasury securities by \$10 billion each month beginning mid-November.

FOMC eliminates directive to Desk to purchase agency CMBS.

**December 15**

FOMC directs Desk to reduce monthly purchases of agency MBS by \$10 billion and of Treasury securities by \$20 billion each month beginning mid-January.

**December 31**

Authorization expires for temporary U.S. dollar liquidity swap arrangements with nine central banks.

IOER is rate of interest on excess reserves. IORR is rate of interest on required reserves. IORB is rate of interest on reserve balances.

CPFF is Commercial Paper Funding Facility; MMLF is Money Market Mutual Fund Liquidity Facility; MSLP is Main Street Lending Program; PDCF is Primary Dealer Credit Facility; PPPLF is Paycheck Protection Program Liquidity Facility; SMCCF is Secondary Market Corporate Credit Facility.

## OPEN MARKET OPERATIONS DURING 2021

## A GUIDE TO THIS REPORT

This report is divided into six main sections:

### 1. The Federal Reserve’s Framework for Monetary Policy

**Implementation:** This section provides an overview of the Federal Reserve’s framework for monetary policy implementation, including the purpose and usage of the various tools employed by the Desk. (pp. 7-8)

**2. Open Market Operations:** This section describes the steps taken by the Desk within the framework to implement the FOMC’s operating directives in money markets and securities markets during 2021. The Desk’s operations to maintain the Federal Reserve’s portfolio of foreign currency–denominated assets are also included in this section. (pp. 9-23)

**3. Emergency Credit and Liquidity Facilities:** This section describes the Federal Reserve’s emergency credit and liquidity facilities established in coordination with the U.S. Treasury to address financial disruptions related to the COVID-19 pandemic. Although they are not open market operations, the emergency facilities are included in this report because they have been relevant for monetary policy implementation over the past two years. (pp. 25-29)

**4. Selected Balance Sheet Developments:** This section examines the composition of the Federal Reserve’s balance sheet, reviews financial developments related to the domestic SOMA portfolio, and discusses the purposes and recent trends

in the Federal Reserve’s liabilities. It also presents an illustrative projection of the balance sheet and SOMA net income scenarios under a set of simplifying assumptions. (pp. 31-50)

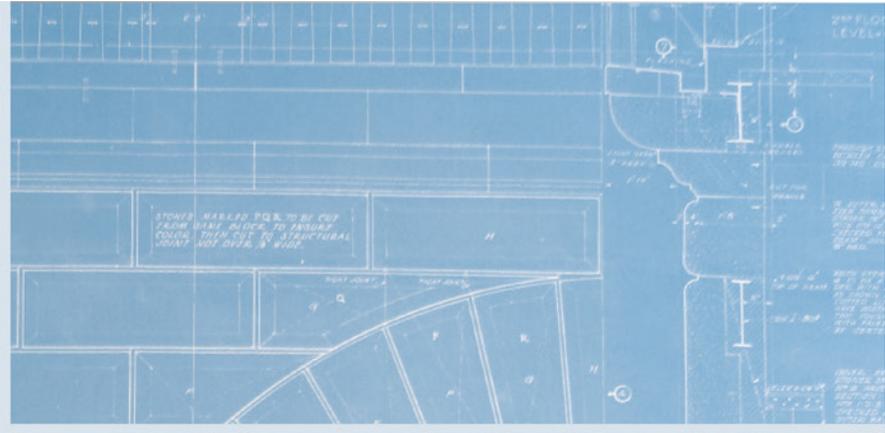
**5. Counterparties:** This section reviews the trading counterparties to the Desk’s domestic and foreign open market operations and certain of the emergency credit and liquidity facilities. (pp. 51-53)

**6. Operational Flexibility and Resiliency:** This final section highlights actions implemented to enhance cyber resilience and details operational readiness exercises undertaken during the year. (pp. 55-57)

Appendix 1 provides summaries of the key terms for each of the Desk’s operations. Appendix 2 highlights links to the governing documents for Desk operations. Appendix 3 summarizes the Desk’s public disclosures about its operations. Appendix 4 presents assumptions underlying the scenarios for the SOMA portfolio and the SOMA net income projections. Appendix 5 provides links to web pages where source material for Federal Reserve–related content can be found.

Underlying data for the charts shown in this report is provided on the New York Fed’s website to the extent that its release is permitted by data suppliers. Additional questions regarding this report and the underlying data can be addressed to [ny.mkt.soma.annualreport@ny.frb.org](mailto:ny.mkt.soma.annualreport@ny.frb.org).

THE FEDERAL RESERVE



# THE FEDERAL RESERVE'S FRAMEWORK FOR MONETARY POLICY IMPLEMENTATION

The Federal Reserve implements monetary policy in a framework that includes a target range for the federal funds rate to communicate the FOMC's policy stance, a set of administered rates set by the Federal Reserve, and market operations directed by the FOMC and conducted by the Desk to promote money market conditions consistent with the FOMC's target range for the policy rate. The FOMC can also employ forward guidance for the target range for the policy rate and alter the size and composition of the Federal Reserve balance sheet as a mechanism for achieving its objectives. The framework supports the FOMC's pursuit of its maximum employment and price stability objectives, mandated by Congress and articulated in the Committee's Statement on Longer-Run Goals and Monetary Policy Strategy, which it reaffirmed in January 2021.<sup>2</sup>

The money market tools used by the Federal Reserve for policy implementation serve to maintain short-term interest rate control in an environment of ample reserve balances in the banking system. The FOMC's key policy rate is the federal funds rate, which is maintained within a target range set by the Committee. The federal funds rate is the rate at which depository institutions and other eligible entities conduct overnight unsecured transactions in central bank balances. The Federal Reserve sets the administered rates—the rate of interest on reserve balances (IORB) paid to banks with accounts at the Federal Reserve, and the interest rate on ON RRP's offered to a wide range of money market lenders—at levels that will foster trading conditions that maintain the federal funds rate well within the target range and support smooth functioning of short-term funding markets.<sup>3</sup>

The IORB functions by providing banks and other eligible entities a minimum interest rate on their reserve balances at Federal Reserve Banks. Given the safety and convenience of maintaining reserves in Federal Reserve accounts, little incentive exists for banks to lend to private-sector counterparties at rates lower than the IORB rate. However, since not all money market participants are eligible to hold Federal Reserve accounts or to earn the IORB rate, the effective federal funds rate (EFFR) can trade below the IORB rate. In this context, the ON RRP facility supports control over the federal funds rate by offering a broad range of money market participants, including those not eligible to earn the IORB rate, an overnight investment, thereby enhancing their bargaining power on short-term private investment transactions. Even as reserve levels increased significantly in 2020 and 2021 in response to asset purchases, the Federal Reserve was able to maintain the EFFR within its target range through use of its administered rates.

In July 2021, the FOMC introduced additional money market tools, including the SRF and the standing FIMA repo facility, to support effective implementation of monetary policy and smooth functioning of markets. These repo facilities, while offered daily, are designed as backstops and are only expected to see significant use on occasions when pressures emerge in overnight funding markets. The SRF is open to primary dealers and eligible depository institutions. The facility's pricing is intended to leave room for robust private market activity under most market conditions while limiting the potential for spikes in repo rates that could move the federal funds rate above its target range. The FIMA repo facility, by providing FIMA account holders an alternative means to access temporary U.S. dollar liquidity rather than sales of Treasury securities, can help address pressures

## OPEN MARKET OPERATIONS DURING 2021

during times of stress in global funding markets. Indeed, the FIMA repo facility complements the U.S. dollar liquidity swap lines as a backstop for dollar funding.

Changes in the size or composition of the balance sheet are an important part of the monetary policy implementation framework, although the primary purpose for asset purchases can vary depending on the circumstances. First, asset purchases can be used as a means to maintain an ample level of reserves in the banking system to support interest rate control. Such reserve management purchases were conducted in 2019 and 2020 to sustainably lift the level of reserves in the banking system. Asset purchases can also be conducted for the purpose of directly influencing financial conditions. In circumstances where the federal funds rate is constrained by the effective lower bound, the FOMC may direct

the Desk to conduct asset purchases to foster accommodative financial conditions broadly. In such cases, asset purchases put downward pressure on longer-term interest rates by reducing the stock of privately held debt. Such purchases were employed in the wake of the global financial crisis to put downward pressure on yields and to promote a stronger economic recovery, and more recently to foster accommodative financial conditions in response to the COVID-19 pandemic. Finally, on occasion, asset purchases can be used to address severe disruptions to market functioning. In these instances, the flow of purchases can ease the balance sheet constraints of private market participants to restore two-way trading and more normal market functioning. In March 2020, asset purchases were conducted to address severe disruptions in U.S. Treasury and agency MBS markets and support market functioning.

## OPEN MARKET OPERATIONS DURING 2021

# OPEN MARKET OPERATIONS

To implement monetary policy, the Desk conducts open market operations as directed by the FOMC. Domestic open market operations in 2021 included outright purchases of Treasury securities and agency MBS, as well as repurchase agreements and reverse repurchase agreements. These operations also included the securities lending program to support smooth functioning of Treasury markets. The Desk also manages the SOMA foreign reserves portfolio and maintains swap arrangements with certain foreign central banks to provide dollar liquidity to global funding markets.

## MONEY MARKET DEVELOPMENTS AND RELATED POLICY MEASURES

Over the course of 2021, the federal funds rate remained within the FOMC's target range of 0 to ¼ percent. The federal funds rate and other money market rates experienced some downward pressure over the year amid increases in liquidity generated by ongoing asset purchases and the drawdown in the TGA, as well as decreases in the supply of Treasury bills, a common money market investment.

Over the year, reserve balances increased by \$649 billion and totaled \$3.64 trillion by year-end (with an average of \$4.17 trillion during December), reflecting the impact of ongoing asset purchases and net changes in other Federal Reserve liabilities. The Desk's \$1.36 trillion in net asset purchases and the \$1.32 trillion drawdown of the TGA were partially offset by a \$1.89 trillion increase in take-up at the ON RRP facility. The TGA balance had reached historically high levels in 2020 as a result of debt issuance in anticipation of stimulus-related disbursements, and then decreased sharply in 2021 as fiscal disbursements occurred while the debt ceiling constrained the

U.S. Treasury's ability to issue new debt. Decreases (increases) in non-reserve liabilities such as the TGA and ON RRP increase (decrease) the level of reserves, all else equal.

Asset purchases and the TGA drawdown drove deposit growth in 2021, albeit at a slower pace than in the prior year. To limit deposit growth and overall balance sheet size, some depository institutions (banks) reduced deposit rates and borrowings in short-term wholesale funding markets and encouraged customers to shift into alternative short-term investment options such as money market funds (MMFs).<sup>4</sup> Indeed, assets under management of government MMFs increased by more than \$430 billion to \$4.03 trillion in 2021. However, as MMFs' balances grew in 2021, their investment options were limited amid a reduction in Treasury bills, whose net supply fell by a record \$1.36 trillion in 2021. The combination of increased financial system liquidity (reserves, deposits, etc.) and reduced supply of investment options for money market investors put downward pressure on overnight rates, including the federal funds rate and market repo rates. The EFFR, which had opened the year at 9 basis points, declined gradually to 6 basis points by mid-June, close to the lower end of the target range. Similarly, SOFR, which had started the year at 10 basis points, decreased to 1 basis point by mid-March (**Charts 1 and 2**).

To help maintain the federal funds rate well within the target range, the Federal Reserve implemented a technical adjustment to administered rates effective June 17, increasing the IOER and ON RRP rates by 5 basis points each to 15 basis points and 5 basis points, respectively (**Table 1**). This adjustment resulted in a 4 basis point increase in the EFFR to 10 basis points. Overnight secured rates increased by a similar magnitude, while Treasury bill

### OPEN MARKET OPERATIONS DURING 2021

Table 1

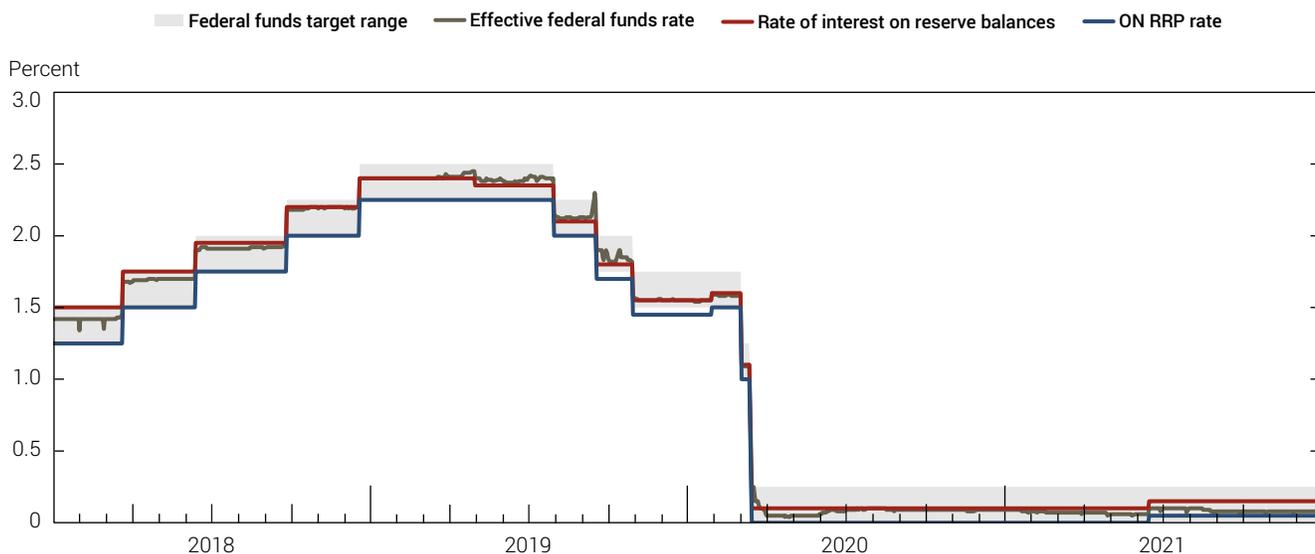
**Key Policy Rates Effective in 2021**

FOMC Meeting Announcing Policy Rate Changes	Effective Date Range for Policy Rates during 2021	Federal Funds Target Range		IORB Rate		ON RRP Rate		Spread between IORB and ON RRP Rates	Primary Credit Rate	
		Rate (Percent)	Change (Basis Points)	Rate (Percent)	Change (Basis Points)	Rate (Percent)	Change (Basis Points)	Level (Basis Points)	Rate (Percent)	Change (Basis Points)
March 2020	January 1 to June 16	0 to ¼	-100	0.10	-100	0	-100	10	0.25	-150
June 2021	June 17 to December 31	0 to ¼	0	0.15	5	0.05	5	10	0.25	0

Sources: Federal Open Market Committee; Board of Governors of the Federal Reserve System.

Note: Prior to July 29, 2021, the interest rate on reserve balances (IORB) was referred to as interest on excess reserves (IOER).

Chart 1

**Federal Funds Target Range, Effective Federal Funds Rate, Rate of Interest on Reserve Balances, and ON RRP Rate**

Source: Federal Reserve Bank of New York.

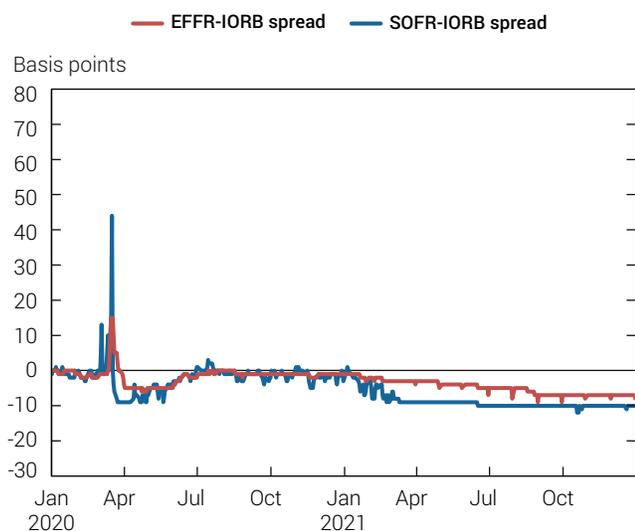
Notes: Figures are daily. Rate of interest on reserve balances for data prior to July 29, 2021, refers to the rate of interest on excess reserves.

and secured and unsecured term rates also increased, but to a lesser degree. The EFR and other money market rates generally held at these levels for the remainder of the year.

The downward pressures on money market rates prompted growing usage of the ON RRP facility beginning in mid-March. Following the Federal Reserve's adjustment to administered

## OPEN MARKET OPERATIONS DURING 2021

Chart 2  
**Effective Federal Funds Rate and Secured Overnight Financing Rate Spreads to IORB**



Source: Federal Reserve Bank of New York.

Note: Data prior to July 29, 2021, refer to the spread to interest on excess reserves (IOER).

rates in June, usage of the facility continued to increase, reflecting ongoing demand from MMFs as well as shifts in the balances of government-sponsored enterprises (GSEs) from their Federal Reserve non-interest-bearing deposit accounts to the ON RRP. Consistent with the framework for monetary policy implementation, the ON RRP supported the EFFR and other money market rates by improving the ability of counterparties to negotiate private investments at rates at or above the ON RRP offering rate and providing an alternative investment when more attractive rates were not available.

## REVERSE REPURCHASE AGREEMENTS

The ON RRP facility helps establish a floor on overnight money market rates by offering an alternative investment to a broad range of money market lenders. During the initial months of 2021, the FOMC continued to direct the Desk to conduct ON RRP operations at an offering rate of 0 percent, the bottom of the target range for the federal funds rate. On June 17, the FOMC made a technical adjustment to the ON RRP offering rate, increasing it

from 0 percent to 5 basis points, to help ensure that the EFFR remained well within the FOMC's target range. The FOMC kept the ON RRP rate at this level until the end of the year.

On March 17, the FOMC directed the Desk to increase the per counterparty limit on the ON RRP facility from \$30 billion to \$80 billion. The increase reflected the growth and evolution of U.S. dollar funding markets since the limit was last changed in 2014, restoring the capacity of the facility relative to the aggregate net asset values of MMFs to roughly the level observed when the facility was established. On September 22, the FOMC directed the Desk to again increase the per counterparty limit, from \$80 billion to \$160 billion, to ensure that the ON RRP facility had adequate capacity to continue to support effective policy implementation for most foreseeable circumstances.

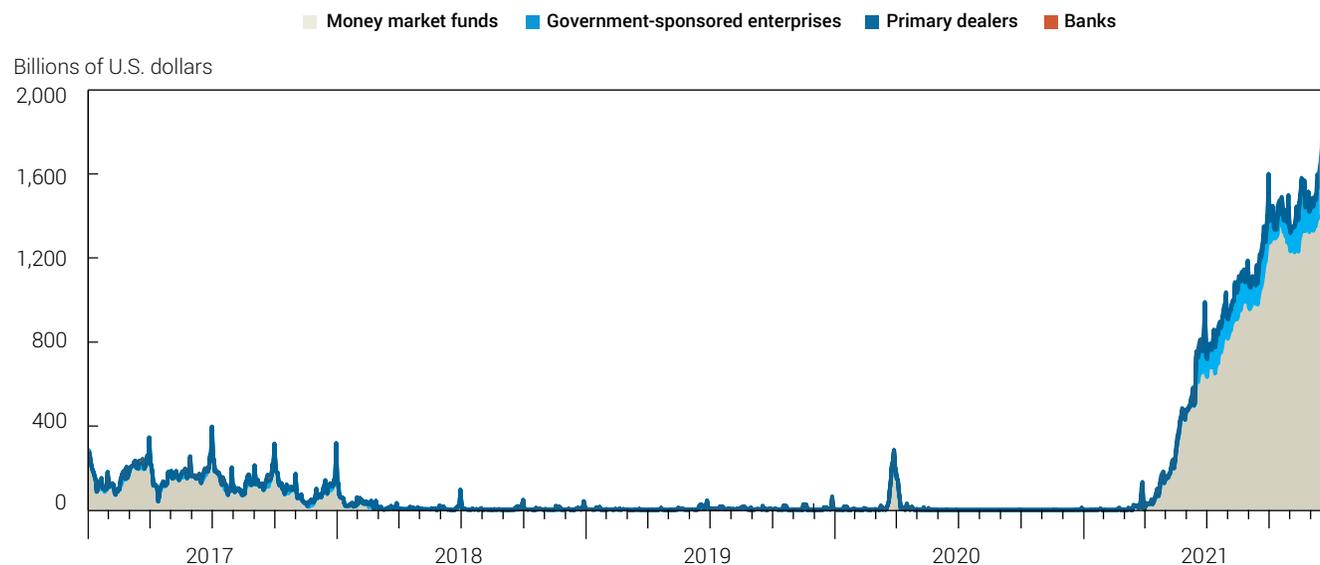
On April 30, the Desk announced several adjustments to its ON RRP counterparty eligibility requirements to make the ON RRP facility more accessible; increased accessibility helps ensure that the facility both supports effective policy implementation and promotes a fair and competitive marketplace. See the "Reverse Repurchase Agreement Counterparties" section of this report for additional details on the adjustment to ON RRP counterparty eligibility requirements.

### Operational Results

Take-up at the ON RRP facility was at near-zero levels through most of the first quarter of 2021 and then increased steadily, primarily driven by investment from MMFs. Following the technical adjustments in June, take-up in the ON RRP continued to increase, including from GSEs, which found it a favorable alternative to their non-interest-bearing Federal Reserve deposit accounts. These trends continued into the second half of the year as eligible counterparties continued to find the ON RRP facility attractive amid low market rates and the decline in Treasury bill supply. The magnitude of the take-up was in part enabled by the successive increases in counterparty limits. Participation reached a record high of \$1.9 trillion at year-end, largely driven by increased take-up by MMF counterparties. This jump in usage at year-end and prior quarter-end dates in 2021 reflected a typical reduction in the availability of overnight wholesale deposits as some banks worked to contain their balance sheet growth. Over the year, MMFs, GSEs, and primary

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Chart 3  
**SOMA Reverse Repo Amounts Outstanding by Counterparty Type**



Source: Federal Reserve Bank of New York.

Notes: Figures are daily and include overnight and term operations.

dealers accounted for 89 percent, 9 percent, and 2 percent on average, respectively, of the participation in the ON RRP (**Chart 3**). See the “Money Market Developments and Related Policy Measures” section of this report for additional detail on the underlying factors driving the increase in ON RRP usage.

## REPURCHASE AGREEMENTS

As directed by the FOMC, the Desk conducted repurchase operations throughout 2021. Through July, the Desk conducted daily repo operations with primary dealers. At its July meeting, the FOMC introduced the SRF as a backstop facility for domestic money markets. The temporary FIMA repo facility was also open through July, after which the FOMC introduced the standing FIMA repo facility.

### OVERNIGHT AND TERM REPURCHASE AGREEMENTS

Through its June meeting, the FOMC directed the Desk to conduct repo operations to support effective policy implementation and the smooth functioning of short-term U.S. dollar funding markets. Through late January, the Desk

offered daily overnight and weekly one-month term repos with minimum bid rates of IOER plus 5 and 10 basis points, respectively, continuing the practice from the prior year. In late January, the Desk announced that the one-month term repo operations would be discontinued in February in light of the sustained smooth functioning of short-term U.S. dollar funding markets. In June, the Desk increased the minimum bid rate on overnight repos to 20 basis points, in line with the 5 basis point technical adjustment to the IOER rate. This minimum bid rate for overnight repos remained in effect until July 28, when the FOMC announced the establishment of the SRF, which is described in the next section.

### Operational Results

Amid smooth functioning funding markets and market repo rates that were generally below the Desk’s minimum bid rates, there was no participation in the overnight and term repo operations, with the exception of test trades, including one operation initiated by the Desk on May 26.

## OPEN MARKET OPERATIONS DURING 2021

## STANDING REPURCHASE AGREEMENT FACILITY

The FOMC announced the establishment of the SRF on July 28, 2021, to serve as a backstop in domestic money markets and thereby support effective implementation of monetary policy and smooth market functioning. The SRF addresses pressures in overnight funding markets that could spill over to the federal funds markets and impair the transmission of monetary policy. Under the SRF, the Desk conducts daily overnight repo operations against Treasury securities, agency debt securities, and agency MBS at a backstop rate. The SRF's key terms—eligible security types, auction format, and other operational features—are substantially similar to those of the Desk's previous overnight repo operations but differ on pricing, which is set to allow for robust private market activity to occur under most market conditions while limiting upward pressure on overnight interest rates in stressed market conditions. As directed by the FOMC, under the SRF the Desk made available daily overnight repo operations with a minimum bid rate of 25 basis points and an aggregate operation limit of \$500 billion.

The SRF is open to primary dealers and depository institutions meeting the eligibility criteria. Prior to the announcement of the SRF in July, the only counterparties eligible to participate in the Desk's repo operations were primary dealers. On October 1, the Desk began accepting expressions of interest from eligible depository institutions to become SRF counterparties. On December 17, the New York Fed added three entities to its list of SRF counterparties, all of which are bank affiliates of current primary dealers. Consistent with the New York Fed's commitment to ensuring its policies promote a fair and competitive marketplace, the eligibility requirements for SRF counterparties will be adjusted over time to allow a broader set of depository institutions access to the facility.

### *Operational Results*

Given continued stable funding market conditions in the latter part of 2021 along with market repo rates trading below the SRF's minimum bid rate, the facility had no usage apart from small-value test transactions.

## FOREIGN AND INTERNATIONAL MONETARY AUTHORITY (FIMA) REPO FACILITY

In tandem with the establishment of the SRF, the FOMC on July 28, 2021, also announced the standing FIMA repo facility to help support the effective implementation of monetary policy and smooth market functioning. The FIMA repo facility provides FIMA account holders a backstop source of temporary U.S. dollar liquidity that can help address pressures in global dollar funding markets that could otherwise affect financial market conditions in the United States. Under the facility, approved FIMA account holders can enter into overnight repo transactions with the Federal Reserve against Treasury securities held in their custody accounts at the New York Fed. As such, the facility provides these account holders an alternative temporary source of dollar liquidity to monetize their Treasury securities. The facility also provides a source of U.S. dollar liquidity to FIMA account holders that do not have liquidity swap arrangements with the Federal Reserve. The facility was priced at a rate of 25 basis points, which, like the SRF rate, was designed to generally be above market repo rates when markets were functioning well, therefore positioning the facility as a backstop.

FIMA account holders enrolled in the facility represented a broad range of global regions, GDP levels, and stages of economic development and accounted for a significant share of foreign official ownership of outstanding Treasury securities. After being established on a temporary basis in March 2020, the FIMA repo facility was extended by the FOMC in July and December 2020 before the standing FIMA repo facility was established in July 2021.<sup>5</sup>

### *Operational Results*

Similar to other repo operations, usage of the FIMA repo facility was minimal throughout 2021 and largely reflected transactions undertaken by FIMA account holders for operational readiness purposes.

## CENTRAL BANK LIQUIDITY SWAPS

In 2021, the FOMC continued to direct the Desk to maintain standing U.S. dollar and foreign currency liquidity swap lines with a network of five other major central banks—the Bank of Canada,

Bank of England (BoE), Bank of Japan (BoJ), European Central Bank (ECB), and Swiss National Bank (SNB).<sup>6,7</sup> The FOMC also continued to direct the Desk to maintain temporary U.S. dollar liquidity swap lines with nine additional central banks. Swap lines of \$60 billion were made available for the Reserve Bank of Australia, Banco Central do Brasil, Bank of Korea, Banco de México, Monetary Authority of Singapore, and Sveriges Riksbank (Sweden); \$30 billion swap lines were made available for the Danmarks Nationalbank (Denmark), Norges Bank (Norway), and Reserve Bank of New Zealand.<sup>8</sup> The temporary U.S. dollar swap line arrangements were initially approved by the FOMC in March 2020 and were extended three times before expiring on December 31, 2021.

During 2021, the majority of U.S. dollar swap operations under both the standing and temporary arrangements were offered at the one-week tenor, while fewer operations were offered at the three-month tenor. In April, in light of improvements in dollar funding markets and low demand at liquidity swap line operations, the BoE, BoJ, ECB, and SNB, in consultation with the Federal Reserve, announced that three-month U.S. dollar operations would be discontinued as of July 1.<sup>9</sup>

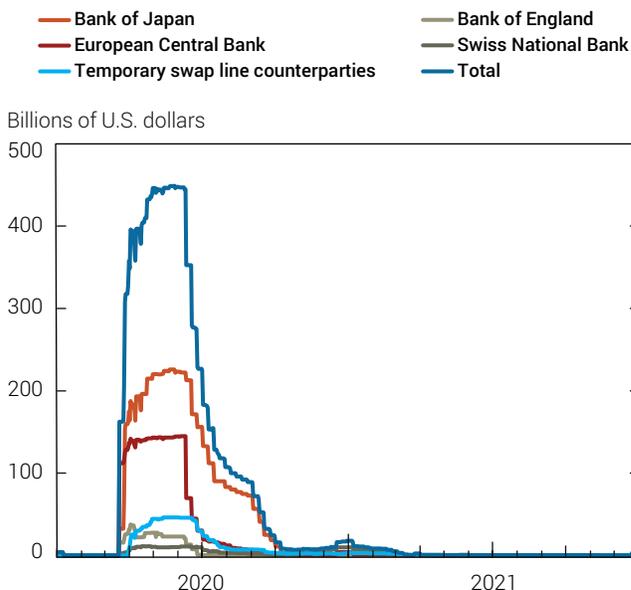
The U.S. dollar liquidity swap lines, which involve a temporary exchange of currencies between two central banks, are designed to provide a liquidity backstop to ease strains in global funding markets, thereby helping to mitigate the effects of such strains on the supply of credit to households and businesses, both domestically and abroad.<sup>10</sup> The foreign central bank receiving dollars lends the dollars in secured transactions with local banks.

### Operational Results

Usage of U.S. dollar liquidity swaps was markedly lower in 2021 compared to 2020, as global dollar funding markets largely functioned smoothly against a backdrop of elevated levels of bank reserves and abundant dollar liquidity across the financial system. Four of the five central banks with standing swap line arrangements drew on their lines in 2021, including the BoE, BoJ, ECB, and SNB. Among temporary swap line counterparties, only the Monetary Authority of Singapore

Chart 4

### U.S. Dollar Liquidity Swaps Outstanding by Central Bank



Source: Federal Reserve Bank of New York.

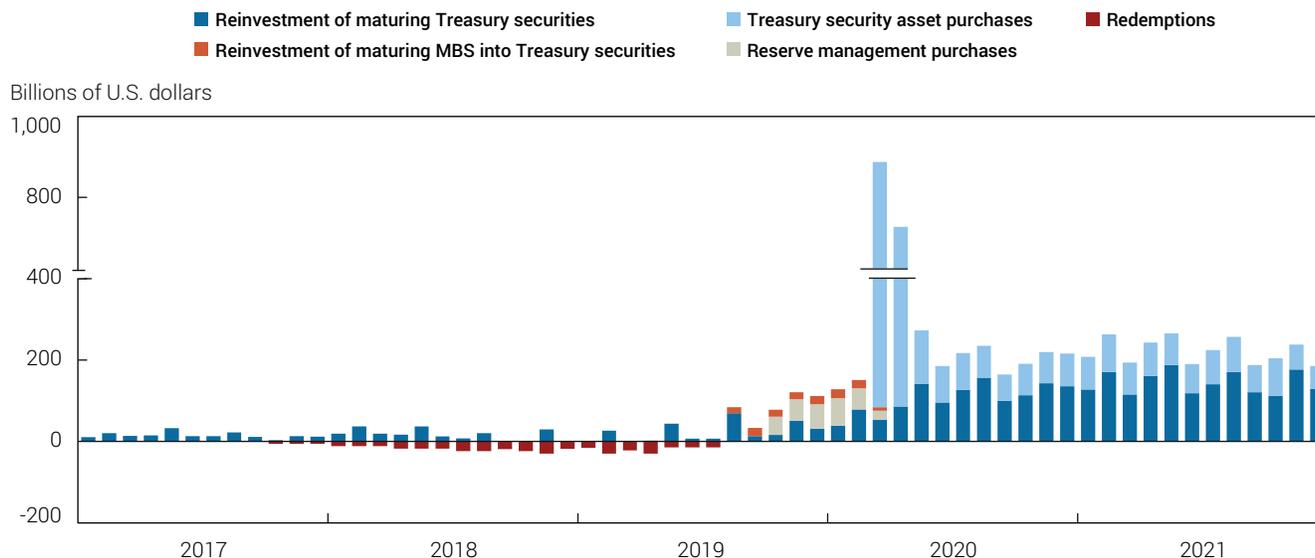
Notes: Figures are daily. Temporary swap line counterparties include the Bank of Korea, Monetary Authority of Singapore, Banco de México, Reserve Bank of Australia, Danmarks Nationalbank, and Norges Bank.

and Banco de México drew on their swap line arrangements (**Chart 4**). The Federal Reserve did not draw on its foreign currency liquidity swap lines with foreign central banks.

In 2021, usage of the central bank swap lines averaged \$270 million in weekly transaction volume. After starting the year at roughly \$18 billion, total aggregate outstanding swaps declined steadily over the first quarter, as outstanding swaps matured and were generally not rolled over. By early April, aggregate outstanding swap balances were below the \$1 billion level, and they remained so until the final days of 2021, when demand from central banks ahead of year-end resulted in a modest increase in usage. At year-end, there were \$3.3 billion of swaps outstanding, primarily in one-week swaps with the SNB and the ECB.<sup>11</sup> The outstanding amounts under the temporary swaps were scheduled to mature in February 2022. During 2021, the New York Fed also undertook small-value test transactions of U.S. dollar and foreign currency swaps for operational readiness purposes.

## OPEN MARKET OPERATIONS DURING 2021

Chart 5  
**SOMA Treasury Transactions**



Source: Federal Reserve Bank of New York.

## TREASURY SECURITIES OPERATIONS

Until November 2021, the FOMC continued to direct the Desk to increase the Federal Reserve’s holdings of Treasury securities by \$80 billion each month to foster smooth market functioning and accommodative financial conditions, thereby supporting the flow of credit to households and businesses. On November 3, the FOMC announced that it would begin reducing net purchases of Treasury securities by \$10 billion per month, starting with the mid-November purchase schedule and continuing the reduction at that pace through the mid-December purchase schedule. In support of its decision, the FOMC cited the substantial further progress the economy had made toward the Committee’s goals on inflation and maximum employment since December 2020. On December 15, the FOMC announced that it would reduce the monthly pace of the Federal Reserve’s net purchases of Treasury securities by \$20 billion, starting with the mid-January purchase schedule, due to inflation developments and the further improvement in the labor market. In its November and December statements, the FOMC also announced that it was

prepared to adjust the pace of purchases if warranted by changes in the economic outlook.

In addition to the directives referenced above, in 2021 the FOMC also directed the Desk to increase holdings of Treasury securities as needed to sustain smooth market functioning. The Desk did not conduct additional operations to purchase Treasury securities, as Treasury markets, with some brief exceptions, generally functioned well and measurably better than had been observed following the outbreak of the pandemic in March 2020. (See **Box 1**, “Interagency Work on Treasury Market Resiliency,” page 17.) The FOMC also continued to direct the Desk to reinvest at auction all principal payments from SOMA holdings of Treasury securities.

### TREASURY SECURITY ASSET PURCHASES

#### *Operational Results*

From January until mid-November, the Desk executed net monthly purchases of \$80 billion before reducing the monthly purchase amount to \$70 billion in mid-November and \$60 billion in mid-December. Over the year, the Desk purchased approximately \$930 billion of Treasury securities in the secondary market (**Chart 5**).

#### OPEN MARKET OPERATIONS DURING 2021

The Desk's Treasury securities purchase operations generally received offers with favorable pricing relative to market and theoretical prices. Offer-to-cover ratios, which measure total amounts offered by primary dealers relative to the amounts purchased, were robust. Specifically, offer-to-cover ratios averaged 2.8, similar to the levels that prevailed between mid-April and December 2020.

Throughout the year, the Desk's purchases of Treasury securities continued to be conducted across a range of maturities roughly in proportion to the outstanding supply of Treasury securities. The maturity sectors for the Desk's operations were revised in May and November 2021 to better reflect the composition of Treasury securities outstanding, as issuance had evolved since purchases began in March 2020. In May 2021, the previous seven- to twenty-year maturity sector was split into two sectors—a) seven to ten years to maturity, and b) ten to twenty-two and a half years to maturity—reflecting the increased issuance around the twenty-year point of the yield curve following the reintroduction of the twenty-year bond in 2020. The Desk refrained from purchasing Treasury bills given the high investor demand and limited supply. In addition, purchases of bills have limited impact on financial conditions (**Chart 6**).

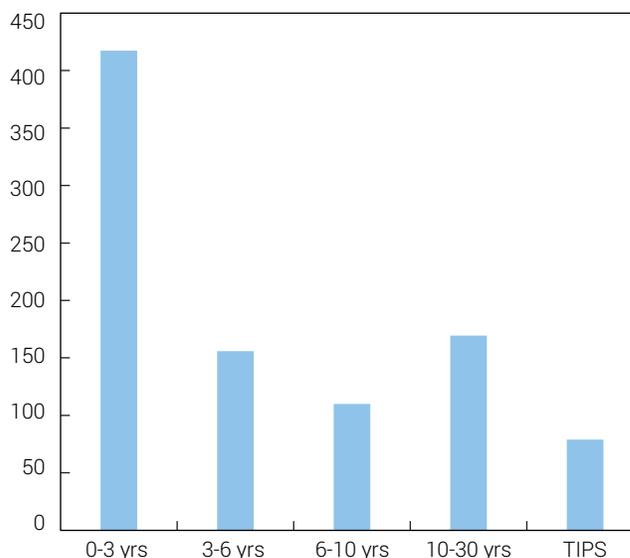
## REINVESTMENTS OF TREASURY SECURITY PRINCIPAL PAYMENTS

### *Operational Results*

The Desk reinvested \$1.73 trillion of maturing Treasury securities holdings at auction in 2021, up from \$1.27 trillion in 2020 (**Chart 7**). The principal payments from maturing Treasury securities held by the SOMA were reinvested at auction into newly issued Treasury securities.<sup>12</sup> In each case, the maturity date of the Treasury security coincided with the issuance date of the securities that were acquired at auction, such that all principal payments were immediately reinvested in full. Maturing Treasury coupons were rolled over into newly issued coupon securities, and maturing Treasury bills were rolled over into newly issued bills. Maturing amounts were apportioned pro rata based on the issuance amounts of securities that settled on the matching maturity date. On mid-month maturity dates, the Desk rolled over maturing Treasury coupon securities into newly issued three-, ten-, and thirty-year

Chart 6  
**Distribution of SOMA Treasury Purchases across Sectors in 2021**

Billions of U.S. dollars



Source: Federal Reserve Bank of New York.

Treasury securities, while at the end of the month, reinvestments occurred in newly issued two-, five-, seven-, and twenty-year, floating rate, and inflation-linked Treasury securities. On Tuesday maturity dates, the Desk rolled over maturing Treasury bills into newly issued four- and eight-week Treasury bills, and on Thursdays, the Desk rolled over maturing Treasury bills into newly issued thirteen-, twenty-six-, and fifty-two-week Treasury bills.

## AGENCY MBS AND AGENCY CMBS OPERATIONS

Through November 2021, the FOMC directed the Desk to continue to increase Federal Reserve holdings of agency MBS by approximately \$40 billion per month to foster accommodative financial conditions and smooth market functioning. As directed by the FOMC, the Desk continued to reinvest all principal payments from holdings of agency debt and agency MBS in agency MBS. In addition, the FOMC directed the Desk to conduct dollar rolls and coupon swaps as necessary to facilitate settlement of agency MBS transactions. On November 3, in parallel with

### OPEN MARKET OPERATIONS DURING 2021

Box 1

## INTERAGENCY WORK ON TREASURY MARKET RESILIENCY

The U.S. Treasury market is a cornerstone for the operation of the U.S. and global financial systems and for the transmission of monetary policy. Recent years have witnessed several episodes of abrupt deterioration in the functioning of some segments of the Treasury market. These occurrences have prompted various industry and official-sector institutions to examine Treasury market structure and propose reforms to enhance market resiliency. The Federal Reserve has a direct interest in the functioning of the Treasury market given its monetary policy mandate and its role in monitoring and mitigating risks to financial stability.

Recent episodes of Treasury market disruption include:

- the “flash rally” of 2014, when the markets for Treasury securities, futures, and related financial instruments experienced an unusually high level of volatility;
- the Treasury repo market stress of 2019, when a spike in the cost of overnight Treasury repo borrowing and repo market volatility negatively affected trading conditions in segments of the Treasury cash and futures markets that relied more heavily on repo financing; and
- most recently, the COVID-19 shock of late February and early March 2020, when investors sold large volumes of Treasury securities

to raise cash, overwhelming the intermediation capacity in the Treasury market and prompting a notable deterioration in market functioning.

In the latter two of these instances, the Federal Reserve intervened to restore market liquidity. These market disruptions—in concert with a sharp increase in the amount of marketable Treasury securities outstanding since 2000, from about \$3 trillion to more than \$22 trillion, as well as substantial evolution in the structure of the Treasury market—have prompted official and private-sector groups to examine avenues to strengthen the resilience of the Treasury market and safeguard its ability to function efficiently in times of stress.

Reports published by the Inter-Agency Working Group (IAWG), the Group of Thirty Working Group on Treasury Market Liquidity,<sup>a</sup> the Brookings Institution,<sup>b</sup> and others have explored the underlying causes of these market disruptions. These reports have noted vulnerabilities associated with abrupt changes in demand for Treasury liquidity; such vulnerabilities were heightened by an increase in the amount of Treasury securities outstanding alongside greater balance sheet constraints on certain broker-dealers that intermediate much of the trading of Treasury securities. Some reports also highlighted structural features that contributed to these vulnerabilities, including the procyclicality of margin

requirements, the diversity and costliness of clearing and settlement mechanisms, the lack of full transparency into prices and trading venue practices, and the growth of electronic trading and its impact on the elasticity of liquidity supply. Taken together, these factors were cited as increasing the likelihood of imbalances that may result in a deterioration in market functioning. The reports also cited limited real-time visibility into trading flows and dealer/investor positions as potentially hampering responses from the official sector.

The IAWG report indicated that it is analyzing opportunities in five key areas: market intermediation, data quality and availability, expanded central clearing, trading venue transparency and oversight, and leverage and liquidity risks.

Separately, private-sector reports have suggested a range of possible solutions to these problems, including:

1. creation of standing repo facilities by the Federal Reserve;
2. broadening of central clearing of Treasury securities;
3. changes to regulatory capital requirements affecting broker-dealers affiliated with bank holding companies; and
4. improving transparency of Treasury market trading activity.

As proposed by these reports, a repo facility would offer backstop financing

of Treasury securities to a broad range of market participants, allowing them ready access to central bank liquidity during times of market stress.<sup>c</sup> The pricing would be set to discourage use during normal times but not during periods of stress. A number of the reports suggested that broader use of central clearing could reduce clearing and settlement risks through the multilateral netting of cleared trades and provide more balance sheet capacity for market makers. Some reports noted that targeted changes to bank regulatory capital requirements (such as potential modifications to the supplementary leverage ratio) could increase the intermediation capacity of bank-affiliated dealers. Finally, many reports stated that improved data collection and disclosure could enable the official sector to better monitor

risks in nonbank financial institutions participating in the Treasury market.

While efforts to evaluate these proposals are ongoing, there have been several recent developments that address the market structure issues raised in the reports. These include the establishment of the SRF and the FIMA repo facility described elsewhere in this report. While it is not their primary purpose, these facilities can help reduce stress in Treasury markets, which are critical to the transmission of monetary policy. Additionally, to improve data quality and transparency, the Financial Industry Regulatory Authority (FINRA) has proposed the collection of Treasury secondary market transactions sooner than end-of-day through the Trade Reporting and Compliance Engine, or TRACE, and the Federal Reserve Board

has adopted a new rule requiring banks to report transactions.<sup>d</sup> In January 2022, the Securities and Exchange Commission (SEC) proposed amendments to its Regulation Alternative Trading Systems (Reg ATS) to cover platforms that trade Treasury securities and Treasury repos. The amendments would also subject Treasury security trading platforms with significant volumes to Regulation Systems Compliance Integrity (Reg SCI), a rule that addresses the resilience of technology infrastructure.<sup>e</sup>

Efforts to strengthen Treasury market resiliency are expected to remain a key focus for the official and private sectors over the coming year. The IAWG will discuss progress at the annual conference on the Treasury market, to be held at the New York Fed, in the fall of 2022.

<sup>a</sup> Group of Thirty Working Group on Treasury Market Liquidity, “U.S. Treasury Markets: Steps Toward Increased Resilience,” 2021. Available at <https://group30.org/publications/detail/4950>.

<sup>b</sup> Nellie Liang and Pat Parkinson, “Enhancing Liquidity of the U.S. Treasury Market Under Stress,” Hutchins Center Working Paper 72, Brookings Institution, December 16, 2020. Available at [https://www.brookings.edu/wp-content/uploads/2020/12/WP72\\_Liang-Parkinson.pdf](https://www.brookings.edu/wp-content/uploads/2020/12/WP72_Liang-Parkinson.pdf).

<sup>c</sup> The Federal Reserve’s SRF, as explained in the “Open Market Operations” section of this report, is open to primary dealers and eligible depository institutions.

<sup>d</sup> The FR 2956 will collect detailed data on depository institutions’ daily transactions of marketable U.S. Treasury securities and the debt and MBS issued by U.S. federal government agencies, including government-sponsored enterprises (agencies). The Federal Register notice is available at <https://www.federalregister.gov/documents/2021/10/28/2021-23432/agency-information-collection-activities-announcement-of-board-approval-under-delegated-authority>.

<sup>e</sup> For more detail on the proposed rule amendments, see the SEC press release, “SEC Proposes Amendments to Include Significant Treasury Markets Platforms Within Regulation ATS,” January 26, 2022, at <https://www.sec.gov/news/press-release/2022-10>.

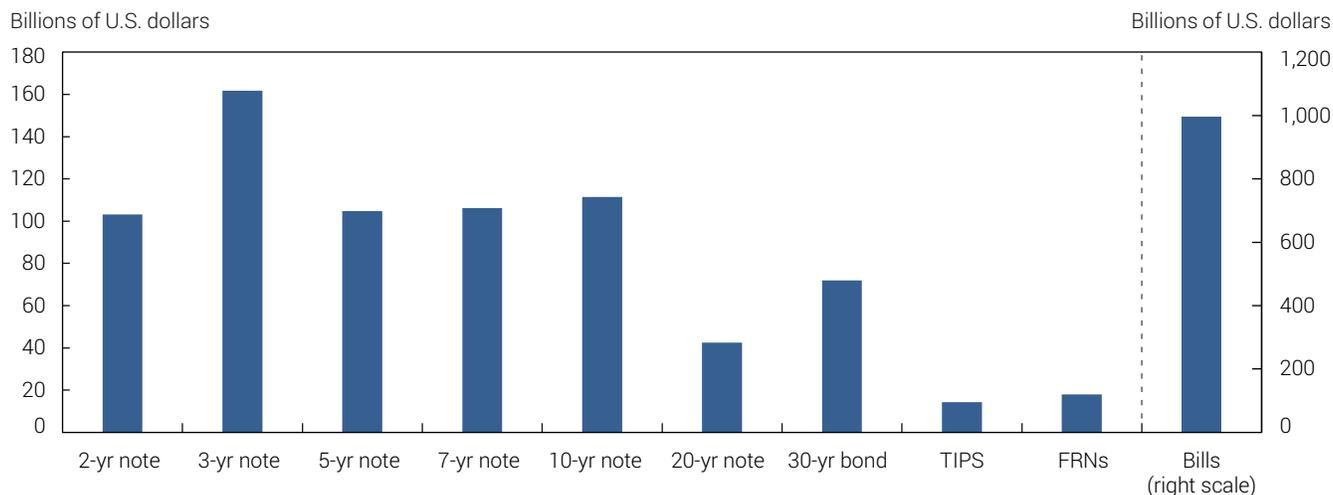
the tapering of purchases of Treasury securities, the FOMC announced that it would reduce net agency MBS purchases by \$5 billion per month, beginning with the mid-November purchase schedule and continuing the reduction at that pace through the mid-December purchase schedule. On December 15, again in parallel with the tapering of purchases of Treasury securities, the FOMC announced that it would reduce the monthly pace of net agency MBS purchases by \$10 billion, beginning with the mid-January purchase schedule. Similar to its announcements

about tapering purchases of Treasury securities, the FOMC also indicated that it was prepared to adjust the pace of purchases if warranted by changes in the economic outlook.

As was the case with Treasury securities markets, the FOMC also directed the Desk to increase SOMA holdings of agency MBS by additional amounts and to purchase agency CMBS as needed to sustain smooth functioning of markets for these securities. As agency MBS markets continued to function well since recovering

## OPEN MARKET OPERATIONS DURING 2021

Chart 7  
**Distribution of Reinvestments at Treasury Auctions in 2021**



from the disruptions observed in early 2020, the Desk did not increase SOMA holdings of MBS by additional amounts. Similarly, the Desk undertook only limited operations early in the year to purchase agency CMBS, as this market also functioned well. On March 17, in light of sustained smooth market functioning for agency CMBS, the Desk announced that after the final scheduled operation on March 23 it would no longer conduct regular operations to purchase agency CMBS. On November 3, following sustained healthy functioning of this market, the FOMC removed agency CMBS from its directive to the Desk.

## AGENCY MBS ASSET PURCHASES

### *Operational Results*

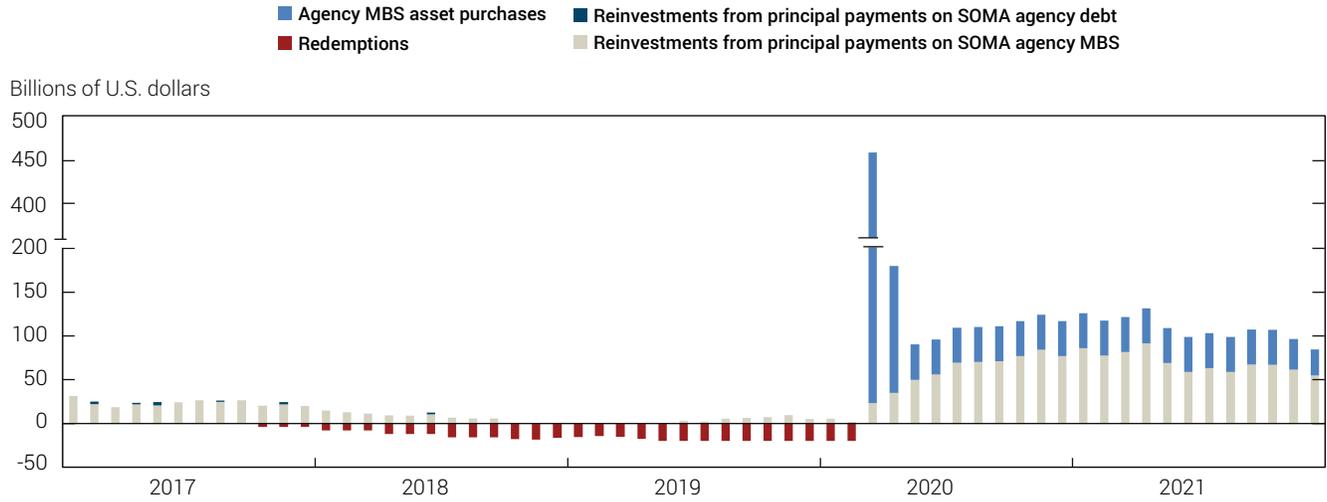
Over the year the Desk purchased in the secondary market \$1.32 trillion of agency MBS, including reinvestments of principal payments on existing MBS holdings (**Chart 8**). The Desk allocated the agency MBS purchases across sectors in line with market production, which hit record levels amid the low primary mortgage rate environment. The Desk purchased securities with coupons between 1.5 and 3.0 percent, spread across fifteen- and thirty-year Uniform MBS (UMBS) issued by Fannie Mae and Freddie Mac and thirty-year Ginnie Mae

securities (**Charts 9 and 10**). Thirty-year securities made up the majority of issuance among the three agencies, corresponding to the popularity of thirty-year mortgages among U.S. homeowners. The Desk's purchases of thirty-year securities accounted for 87 percent of its agency MBS purchases. In line with the market's production, the Desk's purchases of thirty-year UMBS and Ginnie Mae securities were concentrated in mostly 2.0 and 2.5 percent coupons. The Desk's purchases of fifteen-year UMBS amounted to approximately 13 percent of its total purchases of agency MBS and were concentrated in the 1.5 and 2.0 percent coupons (**Table 2**).

The reinvestment of principal cash flows from holdings of existing agency MBS into new agency MBS constituted about two-thirds of the Desk's agency MBS purchases in 2021. Amid near-historically low thirty-year primary mortgage rates and record home price appreciation, many homeowners refinanced their existing mortgages, which led to elevated paydowns on SOMA agency MBS holdings, particularly in the first half of the year. Between January and June, these principal payments averaged \$81 billion per month. As primary mortgage rates increased slightly over the second half of the year, paydowns on SOMA agency MBS holdings slowed to an average of \$62 billion per month.

## OPEN MARKET OPERATIONS DURING 2021

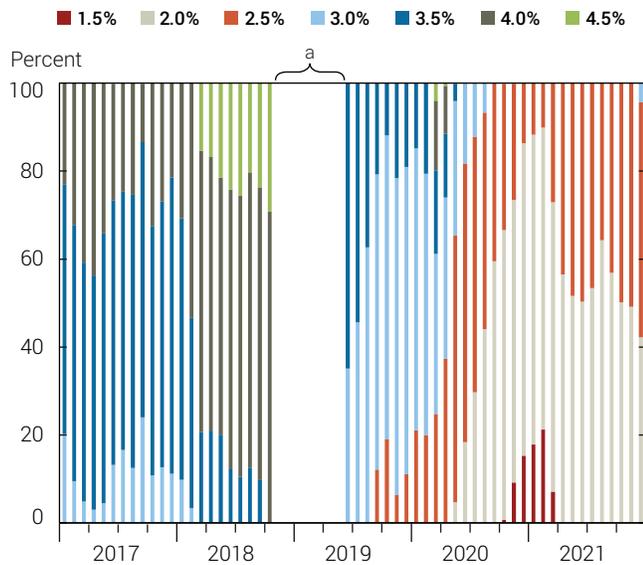
Chart 8  
**SOMA Agency MBS Transactions**



Source: Federal Reserve Bank of New York.

Note: Each bar represents total transactional activity on a mid-month to mid-month basis, consistent with the Desk's announced purchase schedules.

Chart 9  
**SOMA Purchases of Thirty-Year Agency MBS by Coupon**

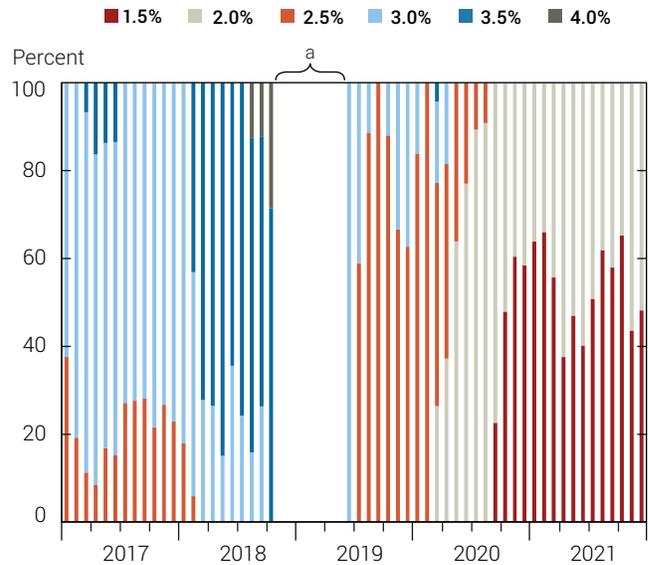


Source: Federal Reserve Bank of New York.

Note: Figures are monthly and exclude purchases conducted for the purpose of testing operational readiness.

<sup>a</sup> The Desk did not conduct reinvestment purchases of agency MBS from November 2018 through May 2019, as monthly principal payments of agency MBS were below the \$20 billion reinvestment cap.

Chart 10  
**SOMA Purchases of Fifteen-Year Agency MBS by Coupon**



Source: Federal Reserve Bank of New York.

Note: Figures are monthly and exclude purchases conducted for the purpose of testing operational readiness.

<sup>a</sup> The Desk did not conduct reinvestment purchases of agency MBS from November 2018 through May 2019, as monthly principal payments of agency MBS were below the \$20 billion reinvestment cap.

OPEN MARKET OPERATIONS DURING 2021

Table 2

**Distribution of Agency MBS Operations in 2021**

Agency	Coupon (Percent)	SOMA Purchases (Billions of U.S. Dollars)	SOMA Purchases as a Share of Gross Issuance (Percent)
<b>30-year</b>			
Uniform MBS	1.5	48.5	36
	2.0	510.2	46
	2.5	310.6	43
Ginnie Mae	2.0	144.7	42
	2.5	127.9	41
	3.0	3.5	3
<b>Subtotal</b>		<b>1,145.3</b>	<b>40</b>
<b>15-year</b>			
Uniform MBS	1.5	90.7	57
	2.0	79.7	42
<b>Subtotal</b>		<b>170.4</b>	<b>44</b>
<b>Total</b>		<b>1,315.6</b>	<b>38</b>

Sources: Federal Reserve Bank of New York; Knowledge Decision Services, LLC.

Notes: Figures may be rounded. Gross issuance represents all fixed-rate agency MBS issued in 2021, including non-TBA-eligible securities. Subtotal issuance comprises all coupons, including those not purchased for the SOMA, with original terms to maturity of fifteen or thirty years. Total issuance comprises all coupons and all original terms to maturity. For TBA outright purchases conducted after May 1st 2019, both Fannie Mae and Freddie Mac securities are deliverable into Uniform MBS contracts.

The Desk can settle agency MBS—that is, take delivery of purchased securities—as much as three months after the trade date. As markets largely functioned smoothly in 2021, the Desk followed conventional forward settlement practices in the to-be-announced (TBA) market. This contrasted with the Desk’s activity during the severe market disruption in March 2020, when some TBA securities were purchased with a specific settlement date within a few days of the transaction date (for example, two days forward as opposed to one month

forward) in order to address the heightened demand for cash at that time.

**DOLLAR ROLLS***Operational Results*

Given the forward-settling nature of the Desk’s agency MBS transactions in the TBA market, agency MBS can become scarce in the market during the time between a transaction’s trade date and its settlement date. In these instances, the Desk may conduct dollar roll sales, which effectively delay settlement to a future date to allow smooth settlement of the purchased securities. Dollar roll sales allow dealers more time to obtain securities required to settle transactions, in exchange for a market price that compensates the Federal Reserve for the delay in settlement. The Desk rolled approximately \$52 billion of settlements in 2021, with most transactions occurring early in the year in response to limited available production at that time. The \$52 billion represents 4 percent of the Desk’s original settling positions during the year, marking a decline from the 10 percent of original settling positions rolled in 2020. Amid relatively stable market conditions and record issuance volumes, settlement of the Desk’s agency MBS purchases went smoothly throughout 2021 (**Chart 11**).

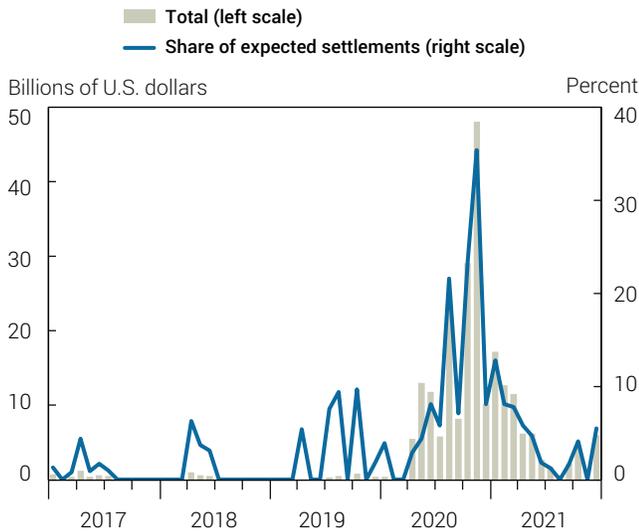
**AGENCY CMBS***Operational Results*

The Desk purchased \$314 million in agency CMBS between January and March, bringing total purchases of agency CMBS since March 2020 to approximately \$10.5 billion. The 2021 asset purchases were composed of \$269 million of Fannie Mae Delegated Underwriting and Servicing (FNMA DUS) pools over the course of four operations, and \$45 million of Ginnie Mae Project Loans over the course of two operations; the Desk also conducted two operations for Freddie Mac K-series, though no propositions were accepted.

The Desk conducted its last agency CMBS operation on March 23. As noted above, the Desk remained ready to conduct agency CMBS purchases as needed to sustain smooth market functioning, as directed by the FOMC. On November 3, the

## OPEN MARKET OPERATIONS DURING 2021

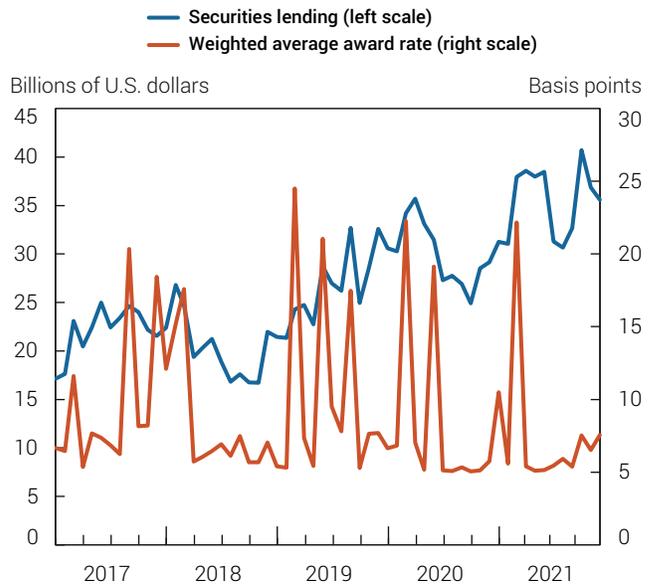
Chart 11  
**SOMA Dollar Roll Sales**



Source: Federal Reserve Bank of New York.

Notes: Figures are monthly by settlement month. Share of expected settlements is calculated excluding purchases conducted for the purpose of testing operational readiness.

Chart 12  
**SOMA Securities Lending in Treasuries**



Source: Federal Reserve Bank of New York.

Note: Figures are monthly averages of daily lending results.

FOMC terminated its CMBS directive. The agency CMBS portfolio experienced principal paydowns of approximately \$916 million over the course of 2021. These principal payments were not reinvested.

## SECURITIES LENDING

To support the effective conduct of open market operations, the FOMC has authorized the Desk to lend eligible Treasury and agency debt securities held in the SOMA to primary dealers on an overnight basis. These operations provide a secondary and temporary source of securities to the financing market to promote the smooth clearing of Treasury and agency securities. Lending Treasury securities, especially those in which the SOMA holds a significant market share, also helps mitigate periods of scarcity (as a result of high levels of short positions or elevated settlement fails, for example).

### Operational Results

In 2021, the Desk continued to conduct daily operations to lend Treasury and agency debt securities from the SOMA portfolio to primary dealers. During 2021, SOMA securities lending volumes in

Treasury securities averaged \$35 billion per day, up from \$30 billion per day in 2020 (**Chart 12**). The increase was partly a result of the SOMA portfolio making up a larger share of outstanding Treasury securities than had been the case in years past, including securities that are in high demand among market participants. Still, securities lending volumes as a proportion of SOMA holdings of Treasury securities and total marketable Treasury debt outstanding remained within the ranges seen in recent years. Despite record average lending volumes during 2021, the volume-weighted average bid fee on Treasury securities was about 8 basis points, unchanged from 2020, notwithstanding infrequent episodes of increased specialness.

## FOREIGN RESERVES MANAGEMENT

The Federal Reserve holds a portfolio of euro- and yen-denominated assets, which could be used to fund a potential foreign exchange intervention.<sup>13</sup> The size and currency composition of foreign reserve holdings is largely a result of past intervention activity in foreign exchange markets. In accordance with their respective statutory authorities, the FOMC and U.S. Treasury make decisions on foreign

### OPEN MARKET OPERATIONS DURING 2021

exchange intervention activity; in 2021, the Desk was not directed to undertake any such activity.

### INVESTMENT APPROACH

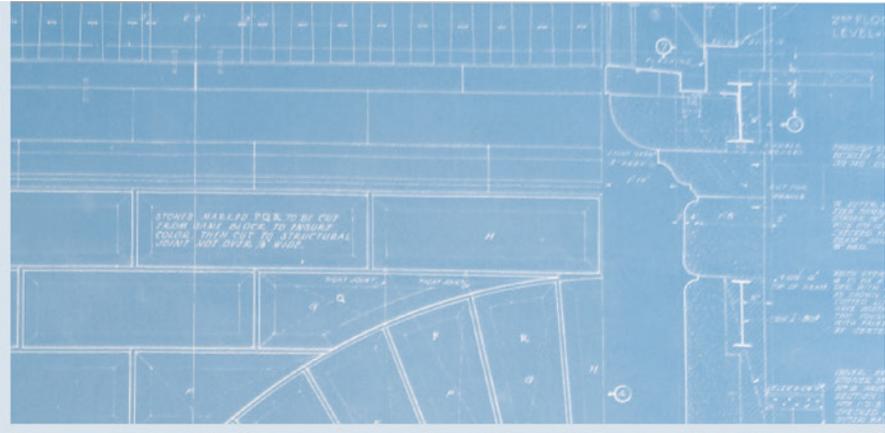
The Desk is directed by the FOMC to manage the SOMA's foreign currency holdings in a manner that ensures sufficient liquidity, maintains a high degree of safety, and, once these objectives have been met, provides the highest rate of return possible in each currency. The Desk passively manages its foreign currency reserve holdings against an internal asset allocation target, which is determined based on the FOMC's stated objectives and updated on an annual basis. The SOMA's foreign currency reserves may be invested on an outright basis in German, French, Dutch, and Japanese government securities, as well as in deposits at the Bank for International Settlements and at foreign central banks such as the Deutsche Bundesbank, Banque de France, De Nederlandsche Bank, and Bank of Japan.

### INVESTMENT ACTIVITY

In 2021, the Desk purchased euro- and Japanese yen-denominated foreign sovereign debt securities in the secondary market consistent with the portfolio asset allocation target. The Desk also continued to hold foreign currency reserves in deposits at various official institutions. As of year-end 2021, the SOMA foreign currency portfolio, on an amortized cost basis, totaled \$20.3 billion, compared with \$22.2 billion at the end of 2020. Since no transactions associated with foreign exchange intervention were undertaken and the interest income was minimal given the low interest rate environment in the euro area and Japan, changes in the portfolio's reported U.S. dollar market value largely reflected the change in the foreign exchange value of the dollar against the euro and Japanese yen over the year.<sup>14</sup> (Foreign currency-denominated holdings are described further in the "Selected Balance Sheet Developments" section of this report.)

## OPEN MARKET OPERATIONS DURING 2021

THE FEDERAL RESERVE



# EMERGENCY CREDIT AND LIQUIDITY FACILITIES

With the improvement of financial market conditions in late 2020 and continuing into 2021, the authorizations for the various emergency credit and liquidity facilities established in response to financial market disruptions associated with the COVID-19 pandemic were allowed to expire. These facilities supported the flow of credit to households, businesses, and state and local governments by providing backstops to key funding markets and giving investors confidence that the Federal Reserve would provide liquidity and credit if needed in those markets. Following the expirations of the facilities' authorizations to purchase assets or extend credit, the facilities went into runoff mode.

Facilities that made short-term credit extensions—the Commercial Paper Funding Facility (CPFF), Money Market Mutual Fund Liquidity Facility (MMLF), and Primary Dealer Credit Facility (PDCF)—were fully wound down in 2021. Given continued improvements in corporate credit markets, the Federal Reserve opted in June 2021 to begin a gradual and orderly liquidation of the Secondary Market Corporate Credit Facility's holdings of corporate bond ETFs and corporate bonds. Sales were completed by the end of August, and the SMCCF was wound down fully by year-end. The Term Asset-Backed Securities Loan Facility (TALF), Municipal Liquidity Facility (MLF), Main Street Lending Program (MSLP), and Paycheck Protection Program Liquidity Facility (PPPLF) all experienced maturities and/or prepayments in 2021 (**Chart 13**). TALF and MLF assets have final maturity dates in 2023, and MSLP and PPPLF loans have final maturity dates in 2026; these assets also can be prepaid at each obligor's discretion.

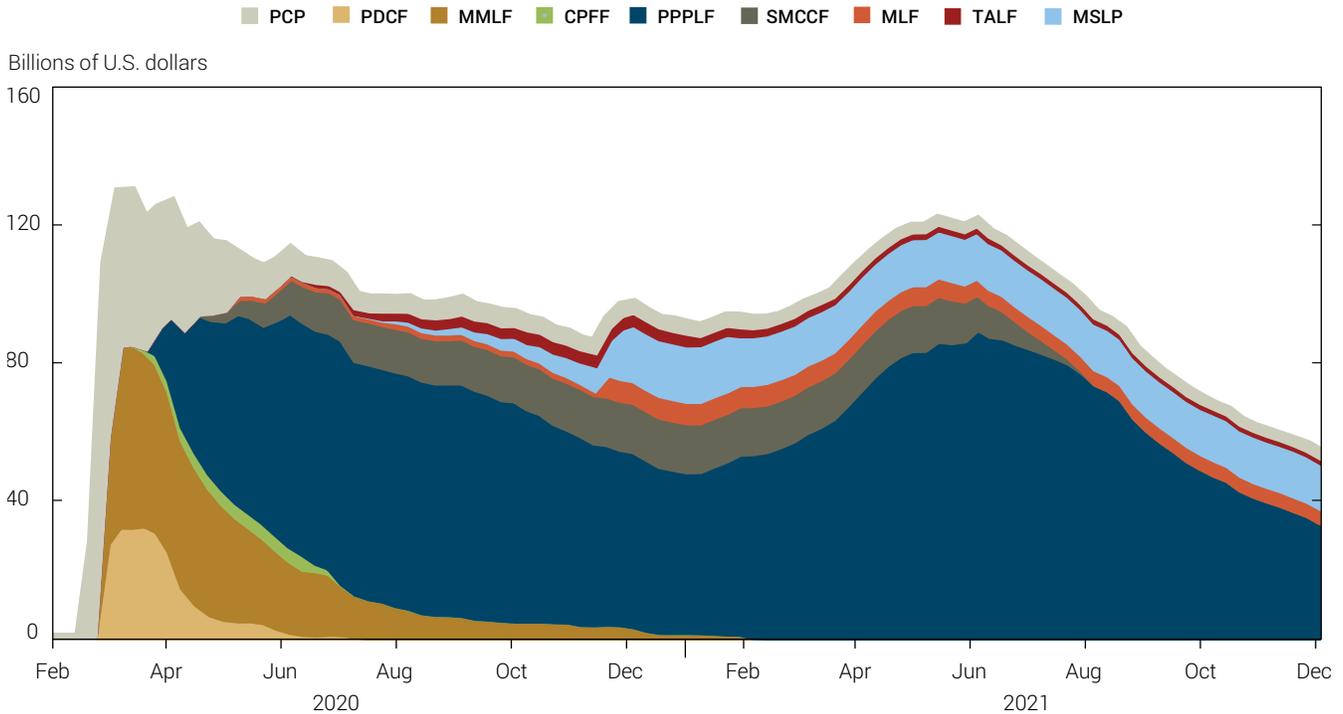
The emergency credit and liquidity facilities had been established under Section 13(3) of the Federal Reserve Act, which allows the Federal Reserve Board in unusual and exigent circumstances, with the approval of the Secretary of the Treasury, to extend credit to any participant in a program or facility with broad-based eligibility for the purpose of providing liquidity to the financial system. In some cases, the U.S. Treasury provided the facilities with equity capital to protect the Federal Reserve against potential losses.<sup>15</sup> Upon closure of the facilities housed in special purpose vehicles (SPVs), any remaining Treasury equity is fully redeemed, and residual earnings of facilities supported by Treasury equity are distributed in 90:10 shares to the U.S. Treasury and the facility's host Reserve Bank, respectively. A significant portion of Treasury equity was redeemed in 2021 in connection with facility closures or asset runoffs. The SPVs that remain open retain Treasury equity in amounts roughly equal to facility holdings to cover any potential losses to the host Reserve Bank. To promote transparency, the Federal Reserve published term sheets that described the rules for the programs, program documentation, and FAQs explaining the purpose, design, and operational details of the programs. As required by statute, the Board also published periodic reports to Congress on the facilities.<sup>16</sup>

## PRIMARY DEALER CREDIT FACILITY

The PDCF's authority to originate new transactions expired on March 31, 2021, and its final transaction matured on April 16, 2021. The facility saw limited usage in 2021 due to improved market conditions. The peak daily loan balance under the PDCF in 2021 was \$535 million, down from the 2020 peak balance of \$37 billion near the start of the pandemic.

### OPEN MARKET OPERATIONS DURING 2021

Chart 13  
Usage of Primary Credit Program and Emergency Facilities



Sources: Board of Governors of the Federal Reserve System; Federal Reserve Bank of New York.

Notes: Data reflect the weekly Wednesday level for the Primary Credit Program (PCP), the Primary Dealer Credit Facility (PDCF), the Money Market Mutual Fund Liquidity Facility (MMLF), the Commercial Paper Funding Facility (CPFF), the Paycheck Protection Program Liquidity Facility (PPPLF), the Secondary Market Corporate Credit Facility (SMCCF), the Municipal Liquidity Facility (MLF), the Term-Asset Backed Securities Loan Facility (TALF), and the Main Street Lending Program (MSLP).

The PDCF was announced on March 17, 2020, to allow primary dealers to support smooth market functioning and facilitate the availability of credit to businesses and households. Through the PDCF, primary dealers could access both overnight and term funding for up to ninety days from the New York Fed. The interest rate charged on PDCF transactions was the primary credit rate, and a broad range of investment-grade securities was accepted as collateral.

## COMMERCIAL PAPER FUNDING FACILITY

On March 31, 2021, the authorization for the CPFF to purchase eligible commercial paper expired. All commercial paper holdings had matured in 2020. On June 29 and

July 7, 2021, the SPV established to purchase commercial paper (CP Funding Facility II LLC) made its final distributions of assets to the U.S. Treasury and the New York Fed. It repaid the \$10 billion equity investment to the Exchange Stabilization Fund (ESF) and distributed residual earnings of \$49.1 million to the U.S. Treasury and the New York Fed at the 90:10 ratio set out in the vehicle’s limited liability company agreement. On July 8, 2021, the legal existence of CP Funding Facility II LLC was terminated.

The CPFF, announced on March 17, 2020, was established to enhance the liquidity of the commercial paper market by increasing the availability of term commercial paper funding to issuers and by providing greater assurance to both issuers and investors that firms and municipalities would be able to roll over

### OPEN MARKET OPERATIONS DURING 2021

their maturing commercial paper. Under the terms of the CPFF, the New York Fed provided financing to the SPV to purchase eligible commercial paper. The pricing was the three-month overnight index swap (OIS) rate plus 110 basis points or the three-month OIS rate plus 200 basis points, depending on the credit rating of the issuer. The facility also charged an initial fee equal to 10 basis points times the maximum amount of an issuer's commercial paper that the SPV could have purchased.

## MONEY MARKET MUTUAL FUND LIQUIDITY FACILITY

The MMLF ceased extending credit on March 31, 2021, and remaining MMLF loans were fully repaid by April 2021.

The MMLF was announced on March 18, 2020, as part of the program of support for the flow of credit to households and businesses by enhancing the liquidity and functioning of crucial money markets. Under the MMLF, the Federal Reserve Bank of Boston (Boston Fed) provided loans to eligible borrowers—including all U.S. depository institutions, U.S. bank holding companies (parent companies incorporated in the United States or their U.S. broker-dealer subsidiaries), or U.S. branches and agencies of foreign banks—to purchase certain types of assets from eligible MMFs, including prime, single state, or other tax-exempt MMFs. The assets, composed of a broad range of high-quality securities, served as collateral for the loans. The U.S. Treasury, using funds from the ESF, committed \$10 billion of credit protection, of which \$1.5 billion was advanced to the Boston Fed. This amount has since been repaid to the U.S. Treasury along with a facility fee for the credit protection. The pricing of the MMLF was the primary credit rate plus up to 100 basis points, depending on the collateral pledged.

## TERM ASSET-BACKED SECURITIES LOAN FACILITY

The TALF ceased extending credit on December 31, 2020. The TALF originated a total of \$4.4 billion in loans secured by eligible collateral in 2020, of which \$3.6 billion remained outstanding at 2020 year-end. By the end of 2021, total loans outstanding had contracted to just \$1.3 billion, primarily due to

faster-than-expected voluntary prepayments from borrowers as well as the routine principal amortization of securities backing the loans. The TALF has one remaining borrower, whose loans are scheduled to mature by December 2023.

The TALF was announced on March 23, 2020, to support the flow of credit to consumers and businesses. Under the TALE, the New York Fed provided financing to an SPV to make three-year nonrecourse loans to holders of certain AAA-rated non-agency CMBS, collateralized loan obligations (CLOs), and asset-backed securities backed by student loans, auto loans, credit card loans, loans guaranteed by the Small Business Administration (SBA), and certain other consumer and commercial receivables. TALF loans were priced as basis point spreads to OIS, SOFR, or the top of the federal funds target range, depending upon the type of collateral and loan term. Using funds appropriated to the ESF through the CARES Act, the U.S. Treasury provided a \$10 billion equity investment in the SPV. Of this amount, the TALF in January 2021 returned \$6.5 billion in equity in excess of the New York Fed's exposure to TALF loans, and in November returned another \$2.2 billion in excess equity. Going forward, the TALF will make similar returns of excess equity on a routine basis twice a year.

## SECONDARY MARKET CORPORATE CREDIT FACILITY

The authorization for the SMCCF to purchase eligible assets expired on December 31, 2020, with the SMCCF holding \$5.5 billion in corporate bonds and \$8.8 billion in corporate bond ETFs.<sup>17</sup> With corporate credit markets continuing to function well as 2021 unfolded, the SMCCF began gradual and orderly sales of its holdings of corporate bond ETFs on June 7, 2021, and of its holdings of corporate bonds on July 12, 2021. As of August 31, 2021, all of the SMCCF's holdings of corporate bonds had either matured or been sold and its ETFs had been sold. The SMCCF asset sales occurred with eligible counterparties including primary dealers and a set of expanded counterparties including minority-, women-, or veteran-owned business entities. See the "Emergency Credit and Liquidity Facilities Counterparties" section of this report for further discussion of SMCCF counterparties.

### OPEN MARKET OPERATIONS DURING 2021

The SPV housing the SMCCF (Corporate Credit Facilities LLC) distributed the \$515 million generated over the life of the facility in installments at a 90:10 ratio to the U.S. Treasury and the New York Fed, as set forth in the SPV's limited liability company agreement. These payments occurred on November 19, 2021, and December 14, 2021. The SPV returned a portion of the Treasury's equity investment on January 5, 2021, following the expiration of the facility's authorization, and the remainder of the equity investment on September 24, 2021, following the completion of sales. The SPV was terminated on December 17, 2021.

The SMCCF was originally announced on March 23, 2020, to support credit to employers by providing liquidity to the market for outstanding corporate bonds.<sup>18</sup> The SMCCF purchased in the secondary market eligible corporate bonds and U.S.-listed ETFs that provided broad exposure to the market for U.S. corporate bonds. The U.S. Treasury made an initial equity investment of \$37.5 billion in the SPV and committed to make up to a total of \$75 billion in equity investment.<sup>19</sup>

## MUNICIPAL LIQUIDITY FACILITY

The MLF ceased purchasing notes as of December 31, 2020. While active, the MLF purchased a total of \$6.6 billion in eligible notes across four issues, of which \$6.3 billion remained outstanding at year-end 2020. By year-end 2021, total notes held had declined to \$4.1 billion due to both voluntary note prepayments and the maturity of one of the notes.<sup>20</sup>

The MLF was announced on April 9, 2020, to help state and local governments manage cash flow stresses caused by the pandemic. The MLF purchased eligible short-term municipal securities directly from eligible issuers through an SPV established by the New York Fed. The pricing was a fixed interest rate based on the maturity-matched OIS rate plus a credit spread based on the long-term rating of the security. Issuers also paid an origination fee equal to 10 basis points of the principal amount of the issuer's notes purchased by the SPV. The U.S. Treasury made an initial equity investment of \$17.5 billion in the SPV, using funds appropriated to the ESF through the CARES Act. In January 2021, the MLF returned

to the U.S. Treasury \$11.2 billion in equity in excess of the New York Fed's exposure to MLF holdings and another \$2.1 billion in excess equity in November. In the future, the MLF will make similar returns of excess equity on a routine basis twice a year.

## PAYCHECK PROTECTION PROGRAM LIQUIDITY FACILITY

The authorization for the PPPLF to originate new loans expired on July 30, 2021. The loan balance under the PPPLF, which started the year at \$50.4 billion, rose to a high of \$91.3 billion in June before steadily declining, as prepayments arising from the SBA's Paycheck Protection Program (PPP) loan forgiveness began to exceed new loan originations. The loan balance ended the year at \$33.9 billion, with a total of 8,765 loans outstanding to 206 institutions. Most of the new PPPLF loan activity in 2021 was driven by the relaunch of the PPP, which had expired on August 8, 2020, but was revived on January 11, 2021, following passage of the Coronavirus Response and Relief Supplemental Appropriations Act, which allocated \$284.5 billion for additional PPP loans.

A total of \$96.3 billion consisting of 11,825 loans was originated under the PPPLF in 2021, a decrease from the prior year when 15,262 loans totaling \$111.8 billion were originated under the PPPLF. The final loan maturity date under the PPPLF is July 31, 2026, although most, if not all, loans are expected to be prepaid due to PPP loan forgiveness.

The PPPLF was announced on April 9, 2020, to bolster the effectiveness of the SBA's PPP by supplying liquidity to participating financial institutions through term financing backed by PPP loans to small businesses. Under the PPPLF, all PPP lenders approved by the SBA, including nondepository institutions, could participate in the program by requesting advances from their local Federal Reserve Bank. The pool of eligible collateral consisted of PPP loans, including those purchased from another PPP lender. The interest rate on PPPLF loans was set at 35 basis points, 10 basis points higher than the primary credit program rate.

### OPEN MARKET OPERATIONS DURING 2021

## MAIN STREET LENDING PROGRAM

The MSLP ceased purchasing participations in eligible loans on January 8, 2021. Loan participations outstanding under the MSLP increased gradually during 2020 and peaked at \$16.6 billion in January 2021. The MSLP outstanding balance at year-end 2021 was \$13.4 billion, and the final maturities of the loans are in 2026.<sup>21</sup>

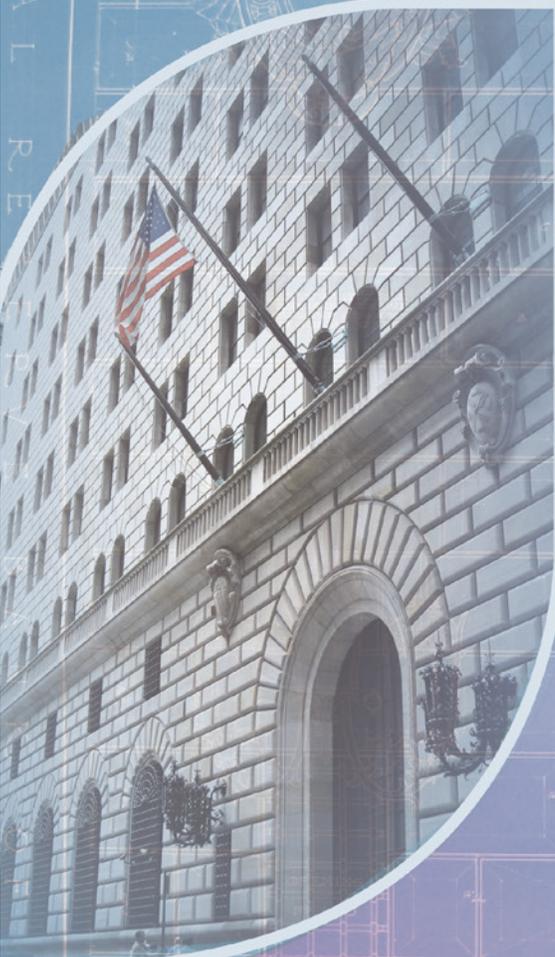
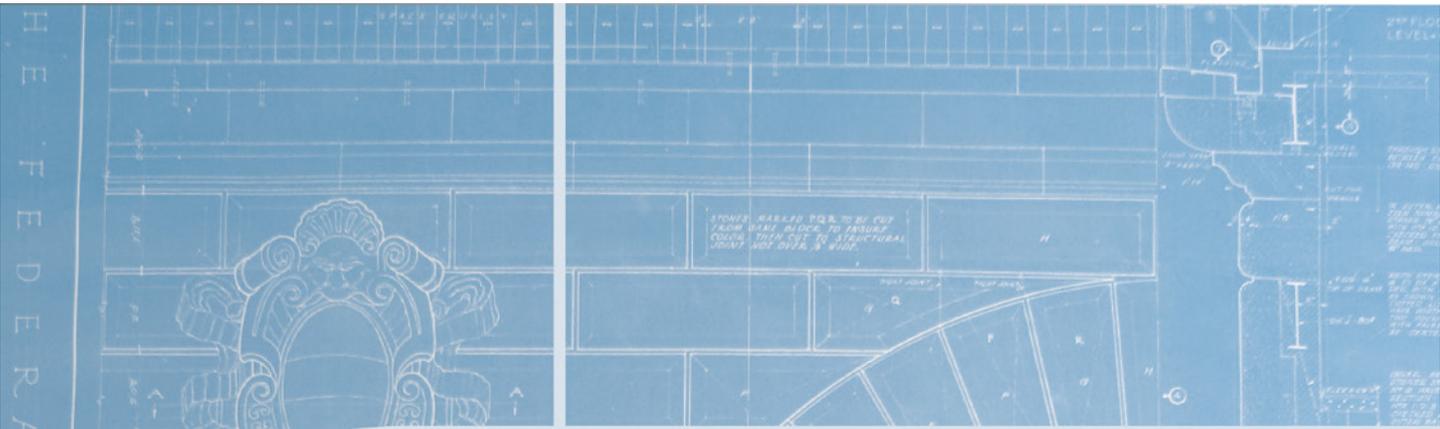
The MSLP was announced on April 9, 2020, to support lending to small and medium-sized businesses and nonprofit organizations that were in sound financial condition before the onset of the pandemic. Under MSLP, the Boston Fed set up one SPV to manage and operate five facilities: three business loan facilities (for new loans, priority loans, and expanded loans) and two nonprofit facilities (for new loans and expanded loans). All loans charged an interest rate of LIBOR plus

300 basis points. Fees ranged from 0 to 1 percent depending on the type, facility, and loan size.<sup>22</sup>

The U.S. Treasury, using funds appropriated to the ESF through the CARES Act, provided a \$37.5 billion initial equity investment in the SPV and committed to make up to a total of \$75 billion in equity investments. The SPV returned to the U.S. Treasury \$20.9 billion of the equity investment on January 8, 2021, and an additional \$0.9 billion on November 19, 2021, reducing the U.S. Treasury's remaining equity investment to \$15.7 billion, which fully protects the Boston Fed against losses from the MSLP loan portfolio. Going forward, the MSLP will make similar returns of excess equity on a routine basis twice a year, subject to a minimum equity floor of \$1 billion for the SPV.

### OPEN MARKET OPERATIONS DURING 2021

THE FEDERAL RESERVE



# SELECTED BALANCE SHEET DEVELOPMENTS

During 2021, the size of the Federal Reserve’s balance sheet increased by \$1.40 trillion, or 19 percent, to a record high level of \$8.76 trillion, driven by growth in the SOMA portfolio as the FOMC continued to direct the Desk to purchase Treasury securities and agency MBS to foster smooth market functioning and accommodative financial conditions. Monthly net asset purchases continued at a steady pace until mid-November, when tapering began. Although significant, the balance sheet growth experienced in 2021 was considerably less than the record growth that occurred in 2020 as a result of large asset purchases to address the COVID-19 pandemic–driven disruptions to financial markets starting in March 2020.

The increase in total assets in 2021 reflected a \$1.54 trillion increase in the SOMA securities portfolio, which totaled \$8.27 trillion at year-end. The increase in the SOMA portfolio was partially offset by a \$40.0 billion decrease in emergency credit and liquidity facility balances, a \$14.6 billion decrease in central bank swaps outstanding, and an \$85.0 billion decrease in other assets, reflecting among other things, redemptions of equity provided by the U.S. Treasury for certain of the emergency facilities (Table 3).<sup>23</sup> As of year-end 2021, the Federal Reserve’s balance sheet measured 38 percent of nominal GDP, compared to 34 percent at year-end 2020, and was roughly double the size of the balance sheet in February 2020.

## SELECTED ASSETS

The Federal Reserve’s assets can be divided into SOMA and non-SOMA assets. The SOMA assets consist of the Federal Reserve’s domestic securities holdings and foreign portfolios, repos, and short-term credit that the

Federal Reserve extends to foreign central banks through U.S. dollar liquidity swaps. Non-SOMA assets include loans to depository institutions through the primary and secondary credit programs, and asset holdings from the emergency credit and liquidity facilities. These assets are Federal Reserve assets but are not part of the SOMA. (See the “Primary Credit Program” and “Emergency Credit and Liquidity Facilities” sections of this report for further details on non-SOMA assets.) All else equal, an increase (decrease) in holdings of a particular asset leads to a corresponding increase (decrease) in reserve balances or other liabilities.

## SOMA DOMESTIC SECURITIES HOLDINGS

### PORTFOLIO SIZE AND COMPOSITION

The vast majority of the SOMA is composed of domestic securities holdings. As of year-end 2021, the domestic securities portfolio was composed of Treasury securities totaling \$5.65 trillion (68 percent), agency MBS totaling \$2.61 trillion (32 percent), agency CMBS totaling \$9.24 billion (less than 1 percent), and agency debt totaling \$2 billion (less than 1 percent) (Chart 14).<sup>24</sup> Holdings of Treasury securities and agency MBS during 2021 increased roughly in proportion to the holdings of these securities at the beginning of the year.

#### Treasury Holdings

In 2021, the Treasury portfolio increased from \$4.69 trillion to \$5.65 trillion, reflecting the Desk’s steady pace of Treasury security purchases of approximately \$80 billion per month for much of the year before tapering to \$70 billion per month in mid-November and \$60 billion per month in mid-December.

## OPEN MARKET OPERATIONS DURING 2021

Table 3

**Changes in Selected Federal Reserve Assets and Liabilities**

Billions of U.S. Dollars

	Assets							Total Assets
	U.S. Treasury Securities	Agency MBS, Agency Debt, and Agency CMBS <sup>a</sup>	Repo	Central Bank Liquidity Swaps	Primary Credit Program	Emergency Credit and Liquidity Facilities	Other Assets	
<b>Outstanding as of:</b>								
December 31, 2020	4,688.9	2,041.8	1.0	17.9	1.6	92.8	516.7	7,358.4
December 31, 2021	5,652.5	2,617.9	–	3.3	0.6	52.8	431.7	8,756.4
<b>Changes in the period</b>								
Dec 31, 2020 to Dec 31, 2021	963.6	576.0	(1.0)	(14.6)	(1.0)	(40.0)	(85.0)	1,398.0

	Liabilities and Capital							Total Liabilities and Capital
	Reserves	Federal Reserve Notes	Treasury General Account	ON RRP	FIMA Reverse Repo Pool	Other Liabilities and Capital	Subtotal of Non-Reserve Liabilities	
<b>Outstanding as of:</b>								
December 31, 2020	2,994.9	2,040.3	1,728.6	9.7	206.4	378.5	4,363.5	7,358.4
December 31, 2021	3,644.3	2,187.1	406.1	1,904.6	278.5	335.8	5,112.1	8,756.4
<b>Changes in the period</b>								
Dec 31, 2020 to Dec 31, 2021	649.3	146.8	(1,322.5)	1,894.9	72.1	(42.7)	748.6	1,398.0

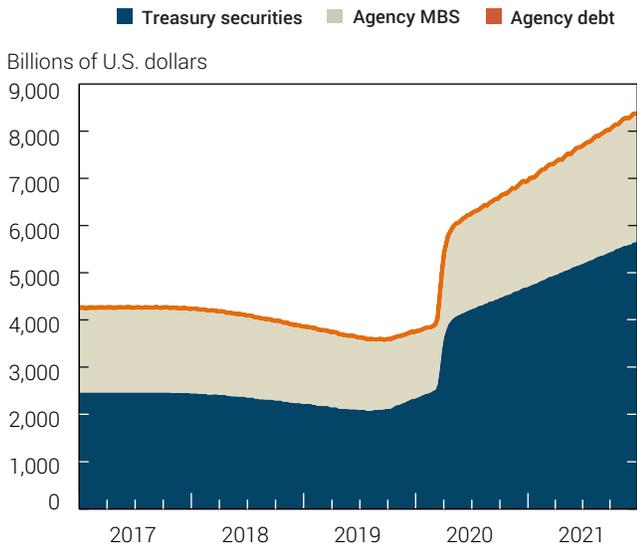
Sources: Federal Reserve Bank of New York; Board of Governors of the Federal Reserve System.

Notes: Emergency credit and liquidity facility outstanding balances exclude nonmarketable portion of Treasury equity. Securities balances are listed at par value. Other assets include primarily unamortized net premium and accrued interest receivable on securities, foreign currency-denominated holdings, and the LLC's investments of U.S. Treasury equity in nonmarketable Treasury securities. Other Liabilities within Other Liabilities and Capital include primarily non-reserve deposits.

<sup>a</sup>Excludes unsettled MBS.

## OPEN MARKET OPERATIONS DURING 2021

Chart 14  
**Composition of SOMA Domestic Securities Holdings**

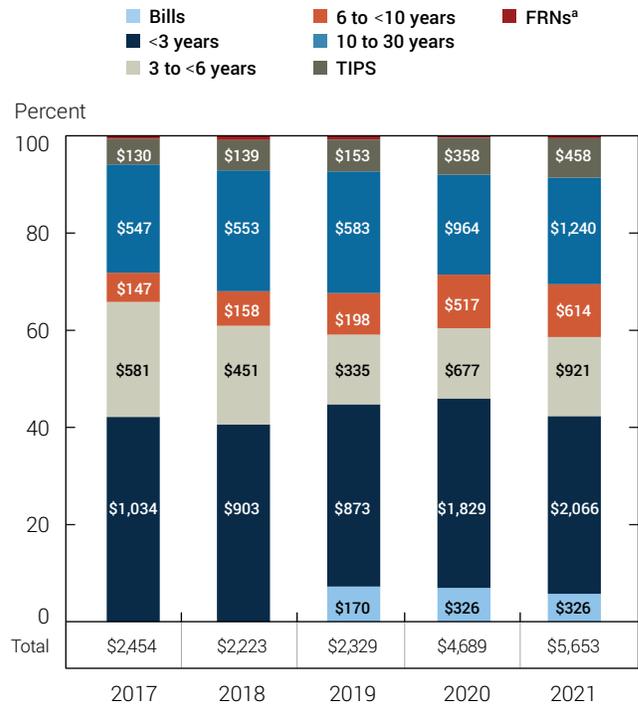


Source: Board of Governors of the Federal Reserve System.  
Notes: Figures are weekly and include unsettled holdings. Agency CMBS are included in agency MBS amount.

The Desk also reinvested proceeds of maturing Treasury securities at auctions.

Desk purchases were conducted in general proportion to the maturity distribution of Treasury coupon securities outstanding. At year-end, nominal coupon securities with less than three years to maturity made up the largest share of the Treasury securities portfolio (**Chart 15**). On net over the year, the shares in the portfolio of nominal coupon securities with three to six years to maturity and ten to thirty years to maturity increased modestly, while the shares of coupon securities with less than three years to maturity decreased modestly. The share of the portfolio held in floating rate notes (FRNs) is minimal, reflecting the U.S. Treasury’s limited issuance of these instruments. On net over the year, the share of bills in the portfolio declined slightly since the Desk did not increase its net bill holdings, both to avoid increasing scarcity value in these securities arising from strong investor demand and because bill purchases have little impact on financial conditions.

Chart 15  
**Distribution of SOMA Treasury Holdings**  
Percentage Share and Billions of U.S. Dollars



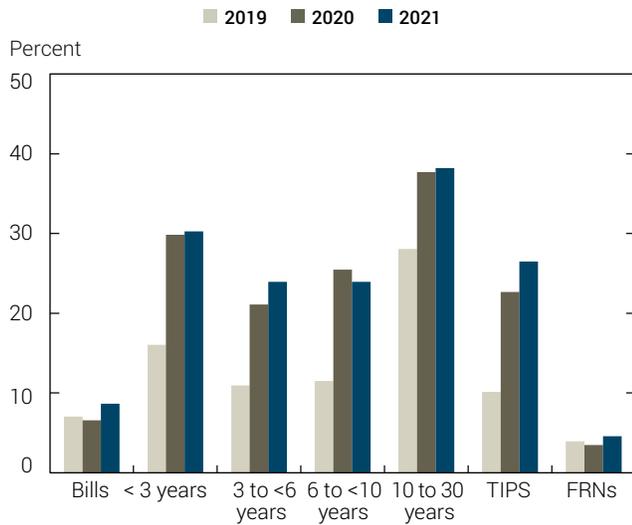
Source: Federal Reserve Bank of New York.  
Notes: Figures are as of year-end and may be rounded.  
<sup>a</sup>Less than 1 percent of holdings in 2017, 2018, 2019, 2020 and 2021 are Floating Rate Notes (FRNs).

SOMA holdings of Treasury securities as a share of the \$22.6 trillion in Treasury debt held by the public (inclusive of SOMA holdings) increased to 25 percent at the end of 2021, compared to 22 percent at the end of 2020. Although overall Treasury debt outstanding increased by \$1.6 trillion during the year, that growth was outpaced in percentage terms by the increase in SOMA holdings of Treasury securities.<sup>25</sup>

The sectors with the largest shares of outstanding Treasury securities held in the SOMA were securities with ten to thirty years remaining until maturity, at 38 percent, and coupon securities with up to three years remaining until maturity, at 30 percent. The SOMA’s share of outstanding Treasury Inflation-Protected Securities (TIPS) rose from 23 percent to 27 percent—more quickly than the rise in other sectors—as

OPEN MARKET OPERATIONS DURING 2021

Chart 16  
**SOMA Treasury Holdings as a Share of Outstanding Treasury Supply**

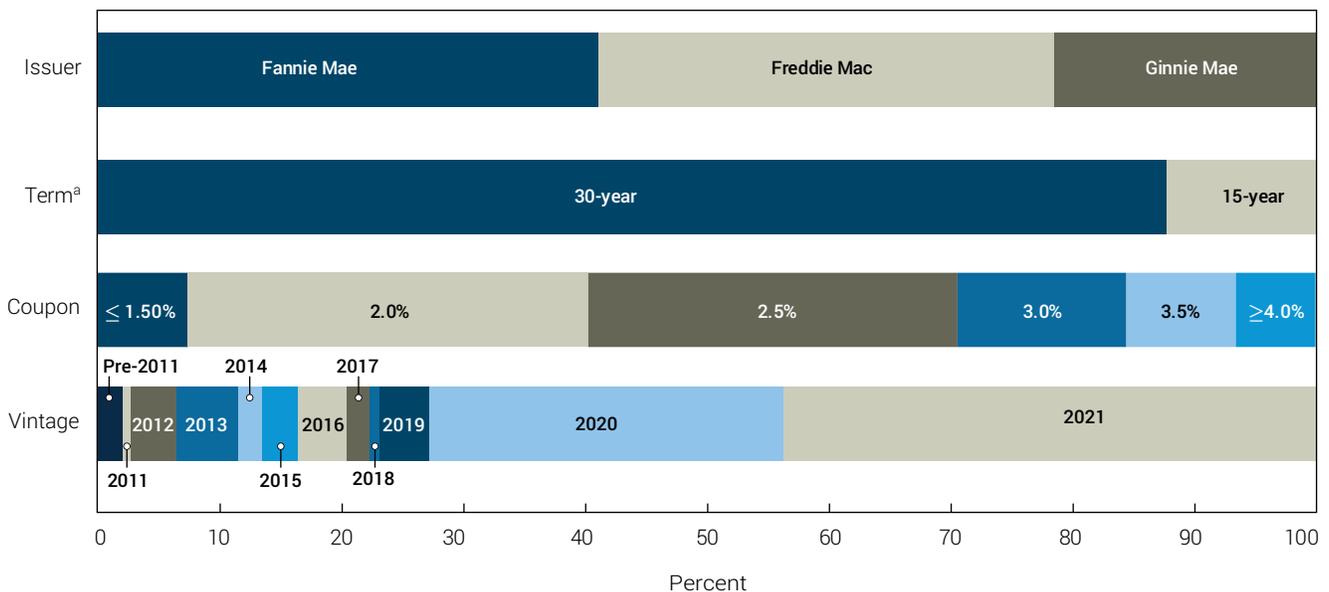


Sources: Federal Reserve Bank of New York; U.S. Treasury Department.  
 Note: Figures are as of year-end.

net issuance of TIPS rose more slowly than other sectors over the year. The SOMA's share of outstanding Treasury bills, while remaining low, increased slightly to about 9 percent, as the SOMA's holdings of Treasury bills remained constant while the stock of outstanding Treasury bills fell sharply as a result of debt ceiling dynamics (Chart 16).

Consistent with the SOMA's concentrated holdings in longer-term Treasury securities relative to the stock of outstanding securities, the weighted average maturity of the SOMA Treasury securities portfolio (7.6 years) was greater than that of the outstanding stock of Treasury debt (6.0 years) at the end of 2021. Relative to year-end 2020, the weighted average maturity of the SOMA Treasury portfolio increased slightly, by 0.3 years, reflecting the increase in the share of Treasury coupon securities holdings and the decrease in the share of bill holdings.

Chart 17  
**Distribution of SOMA Agency MBS Holdings**



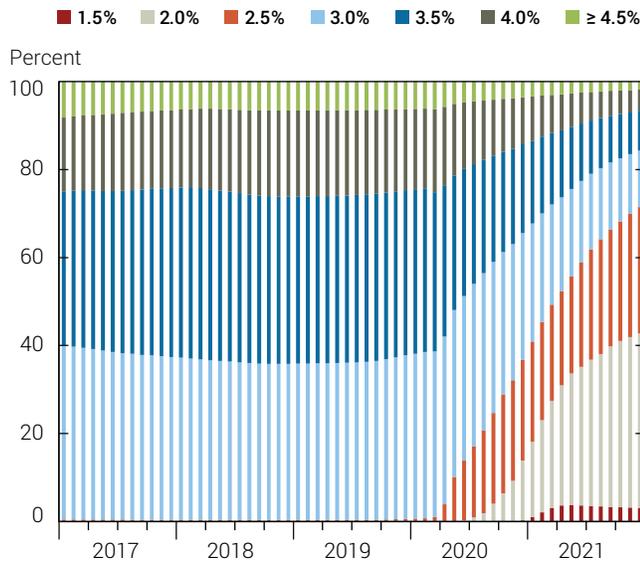
Source: Federal Reserve Bank of New York.

Notes: Figures are as of December 31, 2021. Holdings total \$2.62 trillion and consist of settled holdings only.

<sup>a</sup>Less than 1 percent of holdings are ten- and twenty-year agency MBS, which may be delivered into fifteen- and thirty-year TBA contracts, respectively.

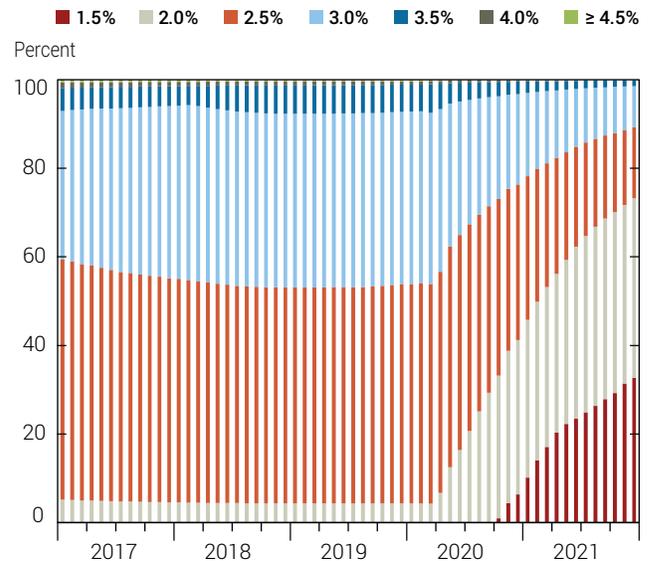
OPEN MARKET OPERATIONS DURING 2021

Chart 18  
**Distribution of SOMA Holdings of Thirty-Year Agency MBS by Coupon**



Source: Federal Reserve Bank of New York.

Chart 19  
**Distribution of SOMA Holdings of Fifteen-Year Agency MBS by Coupon**



Source: Federal Reserve Bank of New York.

*Agency MBS Holdings*

The SOMA’s holdings of agency MBS increased by \$576 billion on net during 2021 to \$2.62 trillion, reflecting new purchases of roughly \$40 billion per month through mid-November, at which time the pace slowed to \$35 billion per month, and then declined to \$30 billion per month beginning in mid-December.<sup>26</sup> Throughout the year, the Desk also reinvested principal payments from the agency MBS portfolio. Given the Desk’s operational approach of purchasing agency MBS in the TBA market, specifically in recently produced coupons, agency MBS delivered to the SOMA were generally concentrated in recently issued securities.

Over the year, the composition of the SOMA agency MBS portfolio evolved across various dimensions—including the issuers, terms, coupons, and vintages of the securities held—as a result of high prepayment activity during the beginning of the year as well as new purchases (Charts 17, 18, and 19). Forty-one percent of the agency MBS portfolio was held in agency MBS guaranteed by Fannie Mae, 38 percent in agency MBS guaranteed by Freddie Mac, and 22 percent in agency MBS

guaranteed by Ginnie Mae.<sup>27</sup> Roughly 87 percent of the portfolio was held in thirty-year MBS, with most of the remainder in fifteen-year MBS.

The share of the agency MBS portfolio held in securities with coupons less than or equal to 2.5 percent increased over the year from 41 percent to 64 percent. The weighted average coupon of the agency MBS held in the SOMA portfolio decreased to 2.5 percent at the end of 2021 from 2.9 percent at year-end 2020. The MBS holdings experienced significant principal prepayments over the year such that, as of year-end, 44 percent of the MBS portfolio had been originated in 2021. The prepayments and the Desk’s continued purchases of new production securities resulted in a sharp increase in the portfolio’s weighted average life and an increase in the concentration of lower-coupon securities. As of the end of 2021, the weighted average life of the agency MBS portfolio was 5.7 years, compared to 3.1 years at year-end 2020.<sup>28</sup>

SOMA’s agency MBS holdings increased more quickly than the outstanding universe of agency MBS. SOMA holdings of agency MBS as a share of the outstanding stock of fixed-rate

OPEN MARKET OPERATIONS DURING 2021

agency MBS rose during 2021 from 30 percent to 34 percent. The characteristics of agency MBS holdings in the SOMA are broadly consistent with those of the outstanding agency MBS market, although the portfolio is slightly more concentrated in lower-coupon securities. At the end of 2021, the weighted average coupon rate of SOMA holdings of agency MBS was 2.5 percent, slightly below the broader market's weighted average coupon rate of 2.6 percent. Similarly, the weighted average age of loans in the agency MBS portfolio was 29 months, while the weighted average age of loans in the broader market was 32 months. These differences are driven by the Desk's practice of purchasing securities in line with the composition of new originations (rather than the composition of the universe of agency MBS); the resulting new holdings referenced lower-coupon and newly issued mortgages.

#### Agency Debt Holdings

SOMA agency debt holdings were unchanged at \$2.3 billion during 2021. These holdings consist of the remainder of the \$172 billion of agency debt acquired by the Federal Reserve between 2008 and 2010 as part of its first large-scale asset purchase program. These holdings were issued by Fannie Mae and Freddie Mac and will mature between 2029 and 2032.

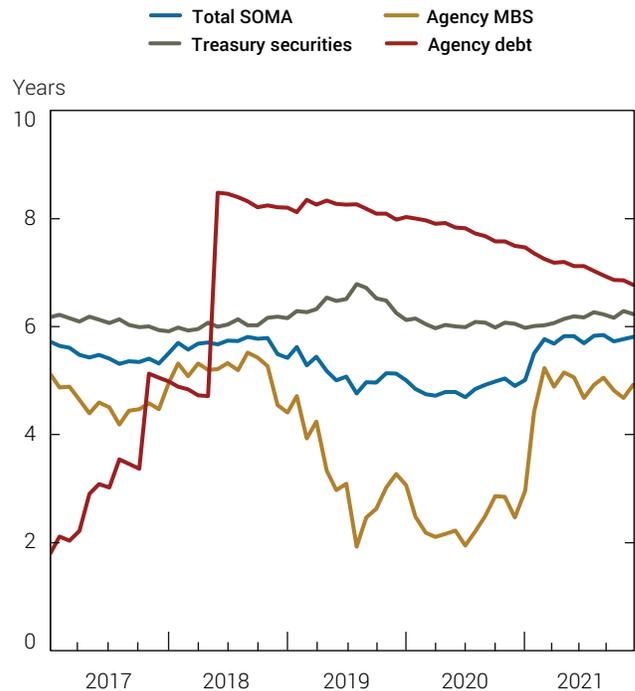
#### Agency CMBS Holdings

SOMA agency CMBS holdings decreased slightly in 2021, totaling \$9.2 billion by year-end, as minimal additional purchases were made over the year and the portfolio was partially paid down. Agency CMBS holdings account for less than 1 percent of total SOMA agency MBS holdings and represent around 1 percent of outstanding agency CMBS. The composition of these holdings was approximately 77.4 percent in Fannie Mae securities, 11.4 percent in Ginnie Mae securities, and 11.2 percent in Freddie Mac securities by the end of 2021. As of year-end, the weighted average life of the SOMA CMBS portfolio stood at 8.3 years. In contrast to the SOMA's Treasury security and MBS portfolios, in which principal payments are reinvested, CMBS portfolio principal payments are not reinvested.

## PORTFOLIO RISK METRICS

During 2021, the par-weighted average duration of the SOMA domestic securities portfolio rose from 4.9 years to 5.8 years,

Chart 20  
Average Duration of SOMA Domestic Securities Holdings



Source: Federal Reserve Bank of New York.

Notes: Figures are as of month-end. Calculations are par-weighted. The rise in agency debt duration during 2018 is due to a maturity that left a small number of agency debt securities with longer tenors in the portfolio. Total SOMA and Agency MBS do not include agency CMBS.

primarily due to an increase from 2.5 to 4.9 years in the duration of the agency MBS portfolio (**Chart 20**).<sup>29 30</sup> Duration measures the sensitivity of a security's price to changes in interest rates and may be thought of as the present value-weighted average time to maturity of cash flows from the security. The longer the duration of a security, the more sensitive it is to changes in interest rates. Duration is generally greater for longer-maturity and lower-coupon securities.

The duration of the portfolio of Treasury securities held in the SOMA increased modestly from 6.0 years to 6.2 years as reductions in duration from the aging of the existing portfolio were more than offset by increases in duration from new net purchases and reinvestments.

The increase in the effective duration of the SOMA's holdings of agency MBS is consistent with the decrease in the average coupon of SOMA agency MBS holdings and the increase in mortgage rates over the course of 2021. The sensitivity of MBS duration to changes in interest rates highlights how prepayments impact the SOMA portfolio. Increases in mortgage rates can decrease prepayment speeds whereas decreases in mortgage rates can increase prepayment speeds.<sup>31</sup> (For more information, see *Open Market Operations during 2017*, **Box 3**, “Agency MBS Prepayment Uncertainty.”)

Measures of the dollar value of duration risk held in the SOMA portfolio increased in 2021. One method of measuring dollar duration is in terms of ten-year equivalents—that is, the amount of ten-year Treasury securities that would be needed to match the duration risk of the portfolio. This metric also provides a risk-adjusted metric of the holdings in the SOMA portfolio. The SOMA portfolio's ten-year equivalent measure increased from \$3.60 trillion at the end of 2020 to \$5.29 trillion at the end of 2021, driven primarily by the increases in holdings of Treasury securities and agency MBS (**Chart 21**).<sup>32</sup>

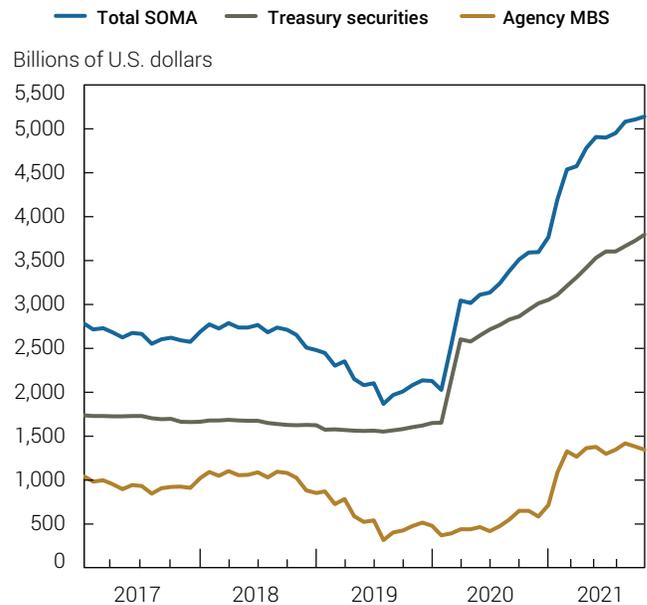
## SOMA REPURCHASE AGREEMENTS

There were no outstanding repurchase agreements at year-end 2021. Amid stable conditions in funding markets, there was minimal take-up over the year at the scheduled repo operations and at the standing repurchase agreement facility, with activity only involving transactions undertaken for operational readiness testing. There were also no outstanding FIMA repo transactions at year-end 2021. Usage was limited throughout 2021 and primarily reflected transactions undertaken for purposes of operational readiness testing. (For more information on repurchase agreements, see the “Open Market Operations” section of this report.)

## CENTRAL BANK LIQUIDITY SWAPS

The aggregate outstanding balance of the U.S. dollar swap lines decreased by \$14.6 billion in 2021 to \$3.3 billion at year-end. Smooth functioning and ample liquidity conditions in global dollar funding markets led to lower usage of the swap lines,

Chart 21  
**SOMA Domestic Securities Holdings in Ten-Year Equivalents**



Source: Federal Reserve Bank of New York.

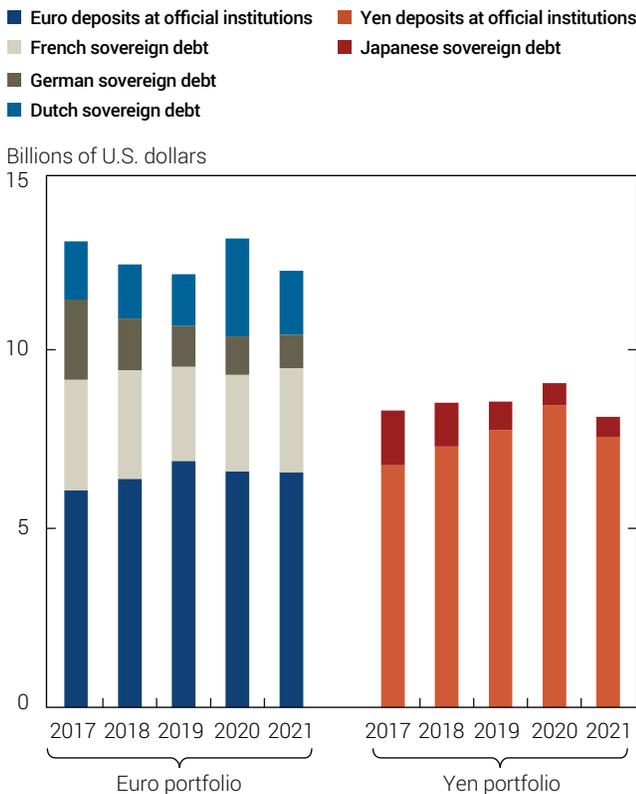
Notes: Figures are as of month-end. Calculations are par-weighted. Total SOMA and Agency MBS do not include agency CMBS. Agency debt is not shown owing to its minimal value.

resulting in the decline in aggregate outstanding swaps over the year. (For more information on central bank liquidity swaps, see the “Open Market Operations” section of this report.)

## SOMA FOREIGN CURRENCY-DENOMINATED HOLDINGS

The Federal Reserve holds foreign currency-denominated assets, which are invested to ensure adequate liquidity to meet anticipated foreign exchange intervention needs. As of year-end 2021, the SOMA foreign currency portfolio totaled \$20.4 billion, composed of \$12.3 billion of euro-denominated assets and \$8.1 billion of yen-denominated assets. The portfolio decreased by \$1.9 billion in U.S. dollar terms over the year, primarily owing to a 7 percent depreciation of the euro against the dollar and a 10 percent depreciation of the yen against the dollar. The share of government debt obligations decreased in the euro-denominated portfolio, while the share of cash

Chart 22

**Distribution of SOMA Foreign Currency Portfolio Holdings**

Source: Federal Reserve Bank of New York.

Note: Figures reflect amortized cost.

held on deposit at official institutions increased; the share of government debt obligations in the yen-denominated portfolio was effectively unchanged (**Chart 22**). (For more information on the foreign currency-denominated portfolio, see the “Open Market Operations” section of this report.)

For euro-denominated assets, the Macaulay duration of the portfolio fell from 27.0 months at year-end 2020 to 25.0 months at year-end 2021.<sup>33</sup> For yen-denominated assets, purchases of government debt obligations increased the Macaulay duration of the portfolio from 0.2 months at year-end 2020 to 0.4 months at year-end 2021.

**PRIMARY CREDIT PROGRAM**

The Federal Reserve’s primary credit program serves as a backup source of liquidity for depository institutions in generally sound financial condition and with appropriate collateral pledged to a Reserve Bank. Loans are initiated by depository institutions and approved by Reserve Banks. In 2021, the primary credit rate for each Reserve Bank was maintained at 0.25 percent, unchanged since March 2020. Primary credit loans continued to be granted for terms of up to ninety days.

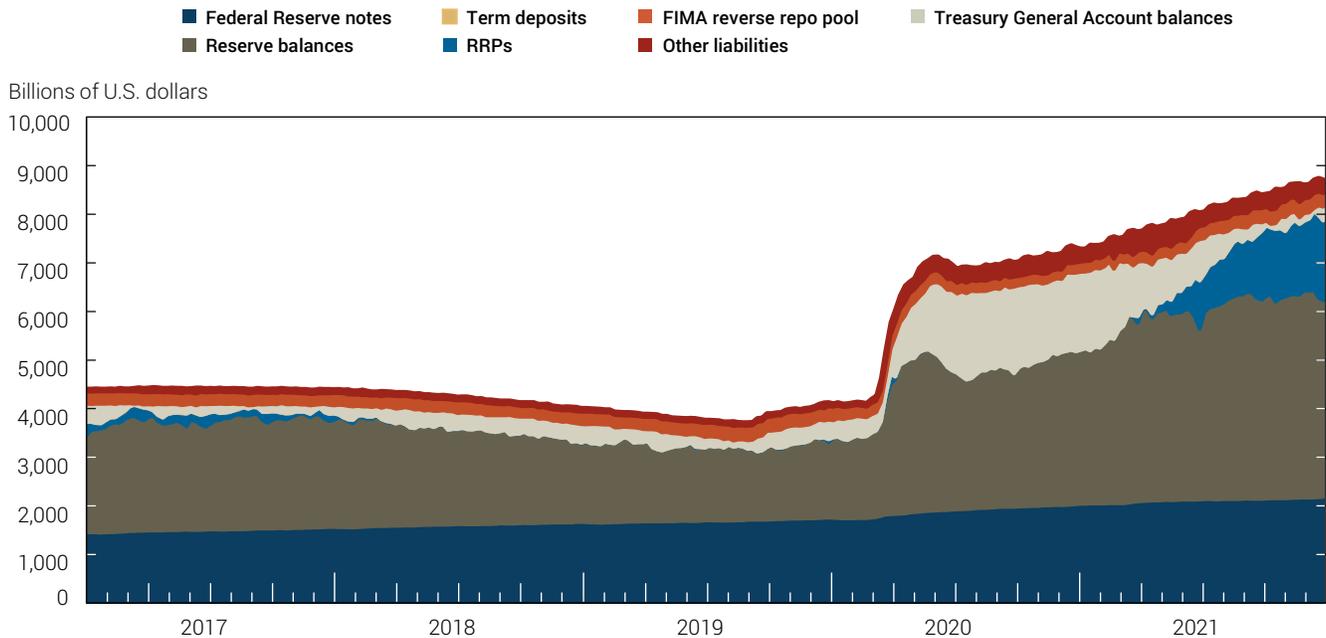
Banks’ use of primary credit fell steadily throughout 2021, as their borrowing needs declined amid elevated levels of reserves in the banking system. The total loan balance under primary credit ended the year at \$555 million, down from a year-end balance of \$1.6 billion in 2020 and a peak balance of \$51.3 billion near the start of the pandemic. Term borrowing represented 11.3 percent of total advances under the primary credit program. As in 2020, small domestic banks accounted for the vast majority of primary credit loan originations in 2021. Loans to foreign banking organizations accounted for 6.4 percent of total advances in 2021, down from 17.2 percent in the prior year. There were no borrowings by domestic global systemically important banks (G-SIBs), except for occasional test borrowings for nominal amounts.

**EMERGENCY CREDIT AND LIQUIDITY FACILITIES**

The total outstanding principal amount across the emergency credit and liquidity facilities was \$52.8 billion at the end of the year, down from \$92.8 billion at year-end 2020. The PPPLF had the largest outstanding balance at year-end of \$33.9 billion, followed by the MSLP at \$13.4 billion, the MLF at \$4.1 billion, and the TALF at \$1.3 billion. The MLF and TALF assets have final maturities in 2023 while PPPLF and MSLP loans have final maturities in 2026, although holdings from any of these facilities may prepay. A portion of PPPLF loans is expected to be paid down as a result of the SBA’s PPP loan forgiveness. (For more information on each facility, see the “Emergency Credit and Liquidity Facilities” section of this report.)

**OPEN MARKET OPERATIONS DURING 2021**

Chart 23  
Federal Reserve Liabilities



Source: Board of Governors of the Federal Reserve System.

Note: Figures are weekly.

## SELECTED LIABILITIES

The Federal Reserve's assets are funded by a variety of liabilities and capital; as explained further below, these liabilities provide safe and liquid assets for the public (for example, Federal Reserve notes), the U.S. Treasury, the banking system, and other entities such as ON RRP counterparties and foreign official institutions. Total Federal Reserve liabilities increase (decrease) when the balance sheet expands (contracts), and the composition of individual liabilities can also shift.

During 2021, the total level of liabilities and capital increased by \$1.40 trillion to \$8.76 trillion. The net increase in liabilities included a \$649 billion increase in reserves and a record \$1.89 trillion increase in ON RRP balances, partially offset by a \$1.32 trillion decrease in the TGA (**Chart 23**). The primary drivers of the increase in reserves and ON RRP balances were the Desk's asset purchases, aimed at fostering smooth market functioning and accommodative financial conditions, and the drawdown of the TGA balance from historically high levels to its lowest level since September 2017. The TGA drawdown resulted

from unprecedented outflows related to the pandemic fiscal response and the U.S. Treasury reducing its cash balance amid debt ceiling dynamics. In turn, the ON RRP facility served, as intended, to absorb a significant portion of the liquidity created by the asset purchases and the TGA drawdown. Federal Reserve notes increased by \$147 billion, remaining above the average annual increase of \$87 billion from 2010 to 2019, as domestic demand for currency increased at the beginning of the year. All else equal, an increase (decrease) in non-reserve liabilities leads to a corresponding decrease (increase) in reserve balances.

## RESERVE BALANCES

Reserve balances, which are deposits held by depository institutions at the Federal Reserve, grew by \$649 billion to \$3.64 trillion at year-end and represented the largest liability of the Federal Reserve throughout 2021.<sup>34</sup> During much of the first quarter, ongoing purchases of Treasury securities and agency MBS drove the significant growth in reserve balances. Starting in March and continuing through much of the remainder of the

### OPEN MARKET OPERATIONS DURING 2021

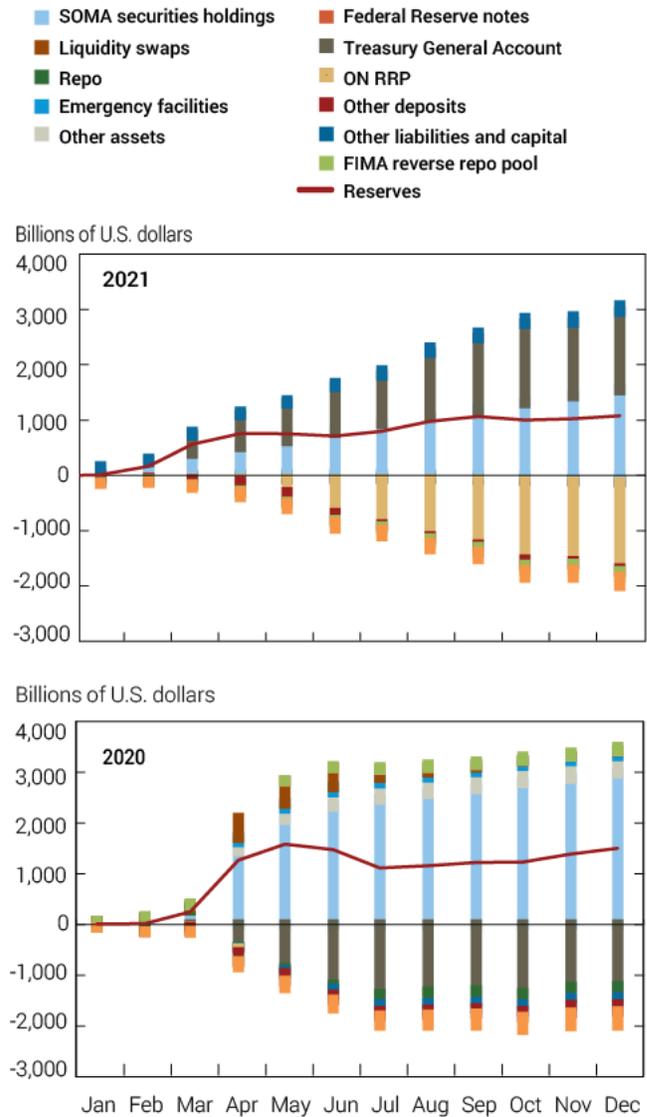
year, the drawdown of the TGA from historically high levels also contributed to the increase in reserves, which peaked at nearly \$4.3 trillion in December. However, downward pressure on rates associated with elevated reserve levels contributed to an increase in ON RRP balances, attenuating further expansion in reserves. Some banks discouraged customer deposits to contain growth in their balance sheets. In this environment, MMFs received large inflows that, amid a dearth of attractive investments, put downward pressure on overnight rates, making ON RRP use more attractive. The midyear upward technical adjustments in the administered ON RRP rate also encouraged some eligible counterparties to place more funds in the ON RRP facility (Chart 24).

## FEDERAL RESERVE NOTES

Federal Reserve notes, commonly known as currency in circulation (currency), increased by \$147 billion during 2021 to \$2.19 trillion by year-end.<sup>35</sup> To U.S. households and firms, currency is an asset that can be readily exchanged for goods and services and serves as a store of value.<sup>36</sup> In addition to domestic demand, demand for U.S. currency can also originate from abroad where it serves similar purposes in certain countries. The rate of growth of currency outstanding has generally reflected the pace of expansion of domestic economic activity in nominal terms. Heightened financial or political uncertainty can also drive growth in currency, as during 2020, when the adverse outlook for the economy and shutdowns associated with the pandemic prompted investors, businesses, and households to move rapidly toward cash and cash-like instruments.<sup>37</sup>

Federal Reserve notes outstanding increased by about 7 percent in 2021, less than half of the 16 percent increase recorded in 2020 and in the range observed during the last decade (Chart 25). During March, there was an uptick in growth of Federal Reserve notes outstanding, corresponding with the latest round of economic impact payments and other stimulus-related outlays following the passage of a third COVID-19 relief bill. Despite the overall increase in Federal Reserve notes for the year, the pace of monthly growth from April through year-end was generally slower than historical averages.

Chart 24  
Annual Source of Changes in Reserve Balances

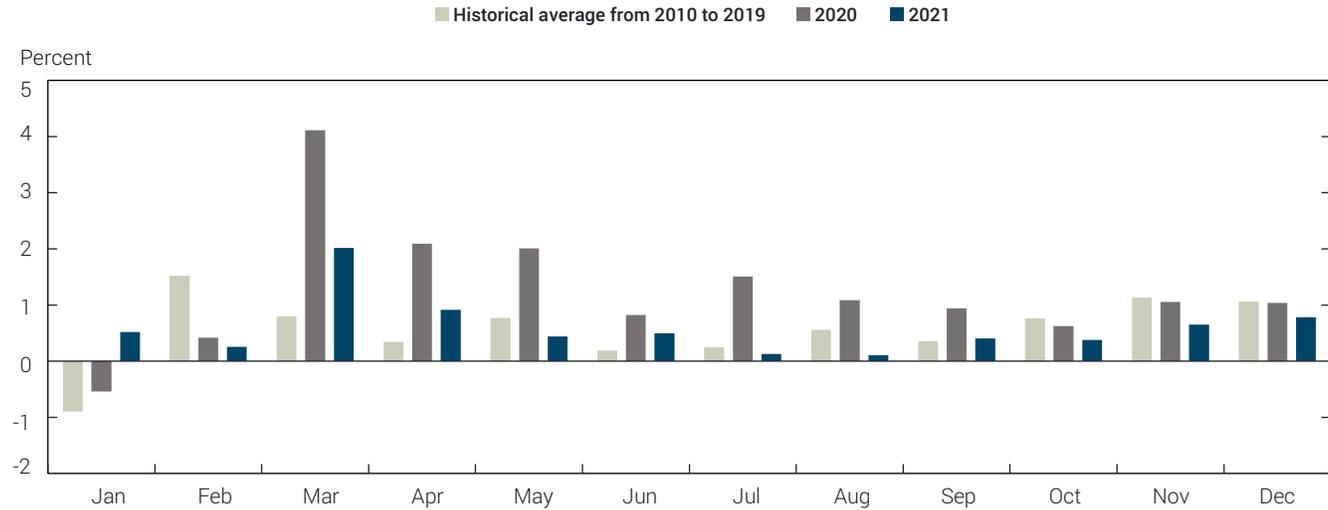


Source: Federal Reserve Bank of New York.

Notes: Emergency facilities reflects the monthly average of the sum of the weekly averages of the PPPLF, PDCF, and MMLF, and the Wednesday levels of the MLF, MSLP, TALF, SMCCF, and CPFF. All other figures are the monthly averages. All else equal, increases in SOMA securities holdings, liquidity swaps, repo, emergency facilities, and other assets increase reserves, while increases in ON RRP, Federal Reserve notes, Treasury General Account, FIMA reverse repo pool, other deposits, and other liabilities and capital decrease reserves. Other assets includes net unamortized premiums and discounts, discount window loans, accrued interest, bank premises, and accounts receivable. Bars above the axis reflect changes supplying reserves, while bars below the axis represent changes reducing reserves.

## OPEN MARKET OPERATIONS DURING 2021

Chart 25

**Monthly Changes in Federal Reserve Notes**

Source: Federal Reserve Bank of New York.

Note: Figures reflect the growth rate of month-end levels.

**REVERSE REPURCHASE AGREEMENTS****OVERNIGHT REVERSE REPOS**

The amount of ON RRP outstanding at the end of 2021 was \$1.90 trillion, compared to \$9.7 billion at the end of 2020, reflecting significant growth that began in March and continued steadily throughout the remainder of the year. As noted above, the increase in ON RRP balances occurred in parallel with the growth in reserves held by depository institutions and the drawdown of the TGA. The two increases in the ON RRP counterparty limit, first from \$30 billion to \$80 billion, and then from \$80 billion to \$160 billion, accommodated greater usage of the facility by eligible counterparties. For more information on ON RRP operations, see the “Open Market Operations” section of this report.

**FIMA REVERSE REPO POOL**

The New York Fed has long offered its FIMA account holders an overnight reverse repo investment service, the FIMA reverse repo pool, also known as the foreign repo pool. At the end of each business day, account holders’ cash balances are routinely swept into an overnight reverse repo secured by the

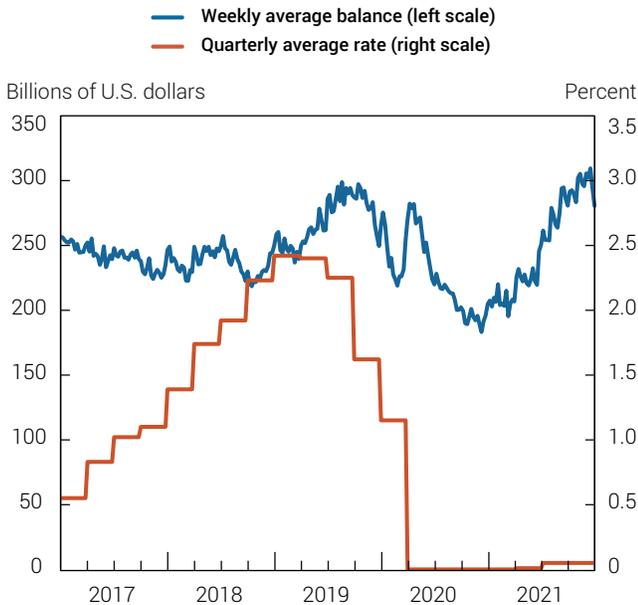
SOMA domestic securities holdings.<sup>38</sup> Upon maturity on the following business day, the securities are repurchased by the SOMA at a repurchase price that includes a return calculated at a rate generally equivalent to the ON RRP rate, although the New York Fed may vary the rate of return at any time without prior notice.

This service addresses a preference by many central banks to hold significant dollar liquidity buffers at the Federal Reserve for policy purposes, and supports operational liquidity needs to clear and settle securities in these accounts. Like other reserve currency central banks, the Federal Reserve offers this service as part of a suite of banking and custody services to central banks, governments, and international official institutions.

Through the first half of 2021, aggregate balances remained roughly unchanged from 2020 year-end levels that were just over \$200 billion. In June, the upward technical adjustment in the ON RRP offering rate and an associated increase in the FIMA reverse repo pool’s interest rate from 0 to 5 basis points contributed to inflows at a fairly steady pace over the

## OPEN MARKET OPERATIONS DURING 2021

Chart 26  
**FIMA Reverse Repo Pool**



Sources: Board of Governors of the Federal Reserve System; Federal Reserve Bank of New York.

remainder of the year; the balance reached a weekly average record of \$309 billion in mid-December, above the previous year's weekly average high of \$282 billion. The inflows included transfers from customers' non-interest-bearing FIMA operating accounts at the New York Fed and increases in the customers' COVID-19-related liquidity buffers (**Chart 26**).

## DEPOSITS

### TREASURY GENERAL ACCOUNT

By statute, the Federal Reserve acts as fiscal agent for the federal government. Consequently, the U.S. Treasury maintains a cash balance at the Federal Reserve—the Treasury General Account—to deposit corporate and individual taxes paid to the U.S. government and to disburse payments, pay interest on federal debt, and settle Treasury security transactions.<sup>39</sup> TGA balances typically exhibit significant variation around Treasury auction settlement dates and debt limit-related deadlines, and they are also affected by the timing of the receipt of tax payments. To ensure it can meet its obligations

even if the ability to borrow new funds is temporarily disrupted, the U.S. Treasury generally strives to maintain a TGA balance that is large enough to ensure that it can cover one week of net outgoing payments and the gross volume of maturing marketable debt, subject to a minimum of roughly \$150 billion; the U.S. Treasury often holds a TGA balance above the level necessary to meet its projected cash need in order to support its regular and predictable approach to issuing debt.<sup>40</sup>

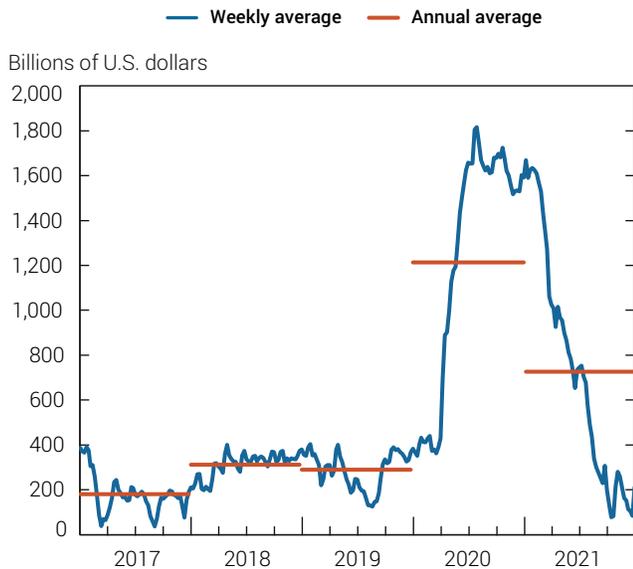
The TGA opened the year at just over \$1.73 trillion, still elevated as a result of the significant U.S. Treasury borrowing in 2020 to fund disbursements related to the fiscal stimulus legislation passed in response to the pandemic. The balance decreased steadily over much of the year, as payments were made to cover fiscal outlays, including pandemic-related expenditures, and as the U.S. Treasury managed the TGA balances around debt limit-related events. The TGA balance reached a trough in December of about \$40 billion ahead of passage of legislation that raised the debt limit by \$2.5 trillion and then rose to a year-end level of \$406 billion. The average weekly TGA balance during 2021 was about \$730 billion, or roughly 60 percent of the \$1.2 trillion average weekly TGA balance during 2020; the weekly fluctuations in the balance were roughly the same as those in 2020 though still markedly more volatile than in prior years (**Chart 27**).

### FOREIGN OFFICIAL AND OTHER DEPOSITS

The Federal Reserve has long offered deposit services to government-sponsored enterprises and international and multilateral organizations. More recently, it has offered deposit accounts to designated financial market utilities (DFMUs).<sup>41</sup> GSEs are financial intermediaries chartered by the federal government that primarily facilitate the flow of credit to housing and agriculture. DFMUs provide the infrastructure for transferring, clearing, and settling payments, securities, and other financial transactions among financial institutions. Access to deposit accounts at the Federal Reserve enables these entities to store their cash in a safe and liquid facility. Unlike deposits held by FIMA customers and GSEs at the New York Fed, deposits held by DFMUs may be remunerated at the rate paid on reserve balances maintained by depository

## OPEN MARKET OPERATIONS DURING 2021

Chart 27

**Treasury General Account Balances**

Source: Board of Governors of the Federal Reserve System.

Note: Figures are averages of daily balances.

institutions or another rate determined by the Board from time to time, not to exceed the general level of short-term interest rates. All eight DFMUs were approved to open accounts at the Federal Reserve in 2013.

In 2021, aggregate balances of foreign official and other deposits rose to record high levels, averaging \$299 billion, well above the average of \$106 billion observed since 2017. The increase was driven by a significant rise in DFMU account balances, which remained elevated throughout the year as DFMUs deposited cash received as collateral and earned interest at rates offered by Federal Reserve Banks. GSE account balances continued to vary widely, temporarily shifting higher ahead of agency MBS principal and interest payment dates; balances declined generally throughout the second half of the year as GSEs increased their participation in the ON RRP facility following the technical adjustment in the ON RRP offering rate. Foreign official deposits declined significantly throughout the second half of the year due to FIMA customers' preferences to shift funds from their uninvested deposits to the FIMA reverse repo pool following the rate adjustment in June.

**FINANCIAL RESULTS**

SOMA portfolio net income increased in 2021, continuing the trend from 2020, and as a result, contributed to greater levels of Federal Reserve income and remittances to the U.S. Treasury. Between 2014 and 2019, SOMA net income and remittances had declined due to higher funding costs associated with rising short-term interest rates and lower average SOMA domestic securities holdings.

**SOMA NET INCOME**

SOMA income—income directly attributable to the SOMA portfolio—was \$120.1 billion in 2021, up \$17.4 billion from the prior year, due primarily to a sharp increase in interest income on Treasury securities from rising Treasury security holdings, which was modestly offset by a decrease in interest income on agency MBS holdings. The decrease in MBS interest income is attributable to reinvestment of principal payments into lower-coupon new issuance, which was partially offset by the additional interest income from the net growth in MBS holdings. SOMA income also reflected a modest decrease in interest expense on reverse repos on SOMA securities (primarily reflecting lower interest expense on the FIMA reverse repo pool) and a loss resulting from the revaluation of foreign currency-denominated asset holdings at current exchange rates.

SOMA net income, a measure that recognizes the total cost of funding SOMA assets on the Federal Reserve's balance sheet—inclusive of the assumed cost of interest-bearing, non-SOMA liabilities—totaled \$114.8 billion, a \$20 billion increase from 2020. This increase primarily reflects higher total SOMA income and to a lesser extent the modest decrease in interest costs of the non-SOMA liabilities (**Table 4**).

**FEDERAL RESERVE REMITTANCES**

The Federal Reserve remits excess earnings to the U.S. Treasury on a weekly basis, after providing for the cost of operations, payment of dividends, and any amount necessary to maintain aggregate Reserve Bank capital surplus up to a specified limit. The Federal Reserve remitted a total of \$109.0 billion to the U.S. Treasury during 2021, up from \$86.9 billion in 2020. The \$22.1 billion increase in remittances stemmed primarily from a rise in SOMA net income (**Chart 28**).

**OPEN MARKET OPERATIONS DURING 2021**

Table 4  
**SOMA Net Income**  
Billions of U.S. Dollars

	2021	2020
<b>Interest income</b>		
Repurchase agreements	–	0.7
Treasury securities	92.6	67.5
Agency debt	0.1	0.1
Agency MBS	29.6	32.3
Other	–	0.5
	122.3	101.2
<b>Interest expense</b>		
Reverse repurchase agreements		
Overnight and term RRP	(0.3)	(0.0)
FIMA reverse repo pool	(0.1)	(0.7)
Other	0.0	0.0
	(0.4)	(0.7)
<b>Non-interest income (loss)</b>		
Foreign currency translation gains (losses)	(1.9)	1.5
Other	–	0.7
	(1.9)	2.2
<b>SOMA income</b>	<b>120.1</b>	<b>102.7</b>
<b>Assumed funding cost</b>	<b>(5.3)</b>	<b>(7.9)</b>
<b>SOMA net income</b>	<b>114.8</b>	<b>94.8</b>

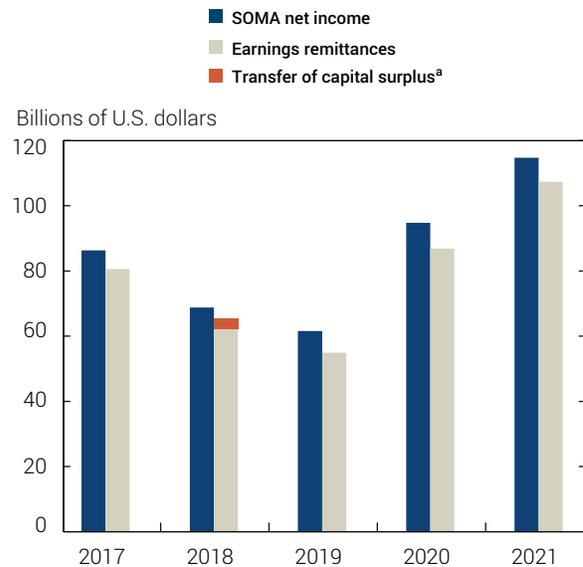
Sources: Federal Reserve Bank of New York; Board of Governors of the Federal Reserve System.

Notes: Assumed funding cost represents interest expense on interest-bearing, non-SOMA liabilities (reserves and certain other deposits) assumed to be associated with SOMA assets. Actual interest expense on all non-SOMA interest-bearing liabilities of the Federal Reserve, including reserves and term deposits, totaled \$5.3 billion for 2021 and \$7.9 billion for 2020. These liabilities fund non-SOMA assets of the Federal Reserve in addition to SOMA net assets.

## SOMA UNREALIZED GAINS AND LOSSES

The market value of the SOMA securities portfolio fluctuates with changes in the prevailing level of interest rates. During 2021, due to an increase in market interest rates across the yield curve, the portfolio's unrealized gain position declined to \$128 billion from the record high of \$354 billion at

Chart 28  
**SOMA Net Income and Federal Reserve Remittances to the U.S. Treasury**



Sources: Federal Reserve Bank of New York; Board of Governors of the Federal Reserve System.

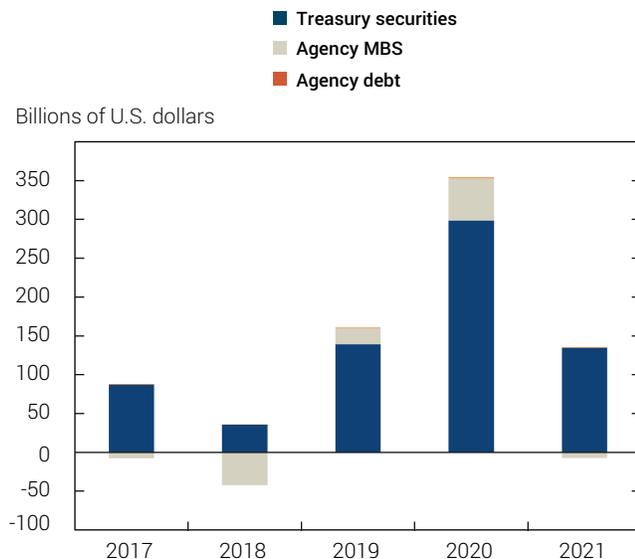
<sup>a</sup>Represents the transfer of capital from Federal Reserve Banks to comply with the statutory limit on the aggregate Federal Reserve surplus. The limit was reduced in 2018 from \$10 billion to \$7.5 billion and then to \$6.825 billion. In 2021, the limit was reduced further to \$6.785 billion by the National Defense Authorization Act for 2021, resulting in a \$40 million transfer by Reserve Banks from their capital surplus. Given the scale of the chart, the 2021 transfer is not visible.

year-end 2020, which had occurred in an environment of lower market rates on Treasury securities and agency MBS and record growth in portfolio holdings (**Chart 29**). The Treasury securities portfolio's unrealized gain position decreased to roughly \$135 billion from \$299 billion at the end of 2020, and the agency MBS portfolio moved to a loss of roughly \$7 billion at the end of 2021 from a gain of \$54 billion at the end of 2020. Unrealized gains on the foreign portfolio decreased to \$68 million at the end of 2021 from \$170 million at the end of 2020.

Unrealized gains and losses are calculated as the difference between the market value of the portfolio and its book value (which reflects amortized cost). The SOMA's unrealized gain or loss position has no effect on net income or Federal Reserve remittances to the U.S. Treasury unless assets are sold and those

## OPEN MARKET OPERATIONS DURING 2021

Chart 29  
**SOMA Domestic Portfolio Unrealized Gains and Losses**



Source: Board of Governors of the Federal Reserve System.

Note: Figures are as of year-end.

gains or losses are realized. When securities are held to maturity, their unrealized gains or losses fall to zero over time as their price reverts to par at maturity. Unrealized gains and losses do not affect the ability of the Federal Reserve to implement monetary policy.

## PROJECTIONS

In the last quarter of 2021, the FOMC began to slow the pace of its net asset purchases, which were conducted to foster accommodative financial conditions and smooth market functioning. At its January 2022 meeting, the Committee decided to continue its ongoing reduction in the monthly pace of net asset purchases, bringing them to an end in early March, and issued Principles for Reducing the Size of the Balance Sheet, providing information on its planned approach for significantly reducing the size of the Federal Reserve's balance sheet. At the May meeting, the Committee issued its Plans for Reducing the Size of the Federal Reserve's Balance Sheet (Plans). The projections presented here incorporate these Plans, illustrating a possible path for the SOMA

portfolio in coming years. The outlook for the balance sheet remains uncertain and the projections are meant to be purely illustrative. The projections demonstrate the overall contours of the path of the portfolio and the balance sheet under one set of assumptions. The actual path of the portfolio will depend primarily on Committee judgments about ample reserves and policy decisions. The projections also include portfolio income and market value gains and losses under a baseline interest rate scenario and under alternative interest rate scenarios. In addition to Committee communications, the assumptions underlying the projections also reflect market participant expectations from the results of the Desk's Surveys of Primary Dealers and Market Participants (Desk Surveys) and simple rules used to proxy the evolution of Federal Reserve liabilities.<sup>42</sup>

Based on these assumptions, the projections suggest that the SOMA portfolio will decline in a predictable manner over coming years, at a pace roughly twice that of the previous episode of balance sheet runoff during 2017 through 2019, as proceeds from principal payments are only reinvested to the extent that they exceed monthly caps. As part of its Plans, the Committee intends to slow and then stop the decline in the balance sheet when reserve balances are somewhat above the level it judges to be consistent with ample reserves. Once balance sheet runoff has ceased, reserve balances will likely continue to decline for a time, until the Committee judges that reserve balances are at an ample level. When reserve balances reach an ample level, the portfolio is projected to resume growth through reserve management purchases.

In addition to providing an illustrative path for the SOMA portfolio, the projections also indicate an illustrative path for portfolio income, as well as potential unrealized gains and losses on portfolio holdings. Under the assumed path, interest rates rise over the projection horizon and the portfolio's net income is projected to decline substantially from recent levels. Additional scenarios that consider alternate interest rate paths show that net income could be higher or lower than the projected path and net income could turn negative for a short period of time.

The unrealized gain position at year-end 2021 turned negative in early 2022 and this loss is projected to grow with the projected

### OPEN MARKET OPERATIONS DURING 2021

increases in market rates for Treasury securities and agency MBS. Alternate scenarios shown suggest that the unrealized gain or loss position of the portfolio could vary widely depending upon the path of market rates. Unrealized gains or losses do not impact the Federal Reserve's ability to implement monetary policy.

## ASSUMPTIONS

This section reviews the assumptions about portfolio runoff, liabilities, and interest rates that are used for the projections; a complete list of key assumptions can be found in Appendix 4.

## BALANCE SHEET

### Assets

The projections assume that the portfolio will evolve in three phases: portfolio reduction, portfolio maintenance, and portfolio growth. Starting in June 2022, monthly principal payments from Treasury coupon securities and agency securities are reinvested only to the extent that they exceed monthly redemption caps. The redemption caps are initially set at \$30 billion and \$17.5 billion per month for Treasury and agency securities, respectively, and after three months, rise to \$60 billion and \$35 billion, respectively. Treasury coupon principal payments are redeemed up to the monthly Treasury cap, and Treasury bills are redeemed when coupon principal payments are less than the monthly cap, with bill redemptions equal to the remainder under the cap.

In discussion at the March 2022 FOMC meeting, Committee participants generally agreed that agency MBS sales would be considered after balance sheet runoff was well underway in order to make suitable progress toward a portfolio composed primarily of Treasury securities. However, these projections assume that reductions in the portfolio are achieved only through redemptions of maturing securities without asset sales, as no plans have been established for such a program.

Consistent with the Plans, the decline in the portfolio slows and then stops when reserves are above the level assumed to be consistent with an ample reserves regime. The amount of reserves needed in an ample reserves regime is highly uncertain, and the projection shows just one illustrative path for the portfolio. The projection assumes that the

level of reserves needed in an ample reserves regime is equivalent to the average level of reserves in December 2019 as a share of nominal GDP (NGDP), or 8 percent, in line with the projection assumptions in *Open Market Operations during 2020*.

Consistent with the plans to slow and then stop the decline in the portfolio before reserves reach this level, redemption caps are reduced when reserves reach 10 percent of NGDP and full reinvestments resume when reserves reach 9 percent of NGDP, resulting in a stable SOMA portfolio. After this point, caps are removed and all principal payments—including those from agency MBS holdings—are reinvested into Treasury securities, in line with the FOMC's stated objective of holding a portfolio primarily composed of Treasury securities in the longer run. The portfolio is assumed to enter the growth phase when reserve balances reach 8 percent of NGDP, at which point purchases of Treasury securities resume at a pace that maintains reserves at an ample level.

### Liabilities and Capital

Demand for most Federal Reserve liabilities is anticipated to grow over time. Accordingly, most non-reserve liabilities and capital are assumed to begin at their average February 2022 levels and grow over the projection horizon in line with nominal GDP; the nominal rate of growth for GDP is set based on median responses to the March Desk Surveys. The median projected long-run growth rates of real GDP and headline personal consumption expenditures (PCE) price inflation were 1.9 percent and 2.0 percent, respectively, implying a long-run level of nominal GDP growth of 3.9 percent.<sup>43</sup>

There are two exceptions to this approach. First, ON RRP balances are assumed to decline to a minimal level over time. This would be consistent with overnight market interest rates rising relative to IORB as the size of the portfolio declines. Second, the TGA is assumed to rise to \$700 billion by the end of the second quarter of 2022, a level in line with the cash balance guidance provided in the Treasury's February 2022 Quarterly Refunding Statement. Thereafter, the TGA is assumed to grow with nominal GDP, similar to other liabilities.

As discussed above, the level of reserves needed to maintain ample conditions is assumed to be 8 percent of GDP for the purposes of these projections. There is substantial uncertainty about the level

of reserves needed to maintain ample conditions in the long run, and as such these projections are merely illustrative.

**INTEREST RATES**

The baseline paths for the federal funds rate and longer-term interest rates are drawn from responses to the March Desk Surveys. In these surveys, the median expected level of the effective federal funds rate is assumed to rise to 2.625 percent by year-end 2024 and to fall to 2.25 percent in the longer term. In the surveys, the ten-year Treasury yield and thirty-year fixed primary mortgage rates rise to 2.5 percent and 4.4 percent, respectively, in the longer run.

The projection exercise also considers a range of outcomes assuming lower and higher interest rates. The charts below also show income and the market value of the portfolio in scenarios where interest rates are 100 basis points higher or lower than the values obtained from the March Desk Surveys. The data files for this report also include scenarios where interest rates are 200 basis points higher or lower than the values obtained from the March Desk Surveys.

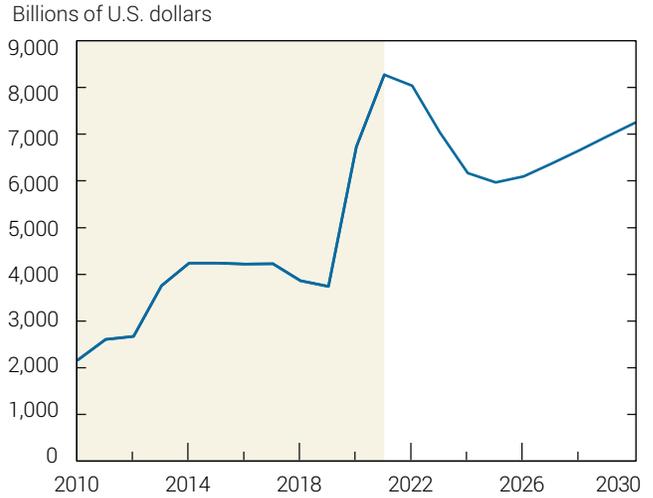
The IORB rate is assumed to be set 10 basis points below the top of the target range and the ON RRP offering rate is assumed to be set 5 basis points above the bottom of the target range. These assumptions for the administered rates are consistent with the FOMC’s March 2022 Implementation Note.

**PROJECTION RESULTS**

**PATH OF PORTFOLIO HOLDINGS AND RESERVE BALANCES**

Starting with the SOMA domestic securities portfolio as of February 2022 and incorporating the assumptions described above results in the projected path of the SOMA through 2030 shown in **Chart 30**. The portfolio declines through mid-2025 as maturing principal payments are allowed to run off, subject to caps, starting in mid-2022. The pace of decline is more rapid early in the projection period, with monthly declines averaging roughly \$80 billion through 2024, after which the pace slows as the caps are reduced. After declining by about \$2.5 trillion from the peak size reached in the first half of 2022, the portfolio stops declining in mid-2025, at which point it is held constant at \$5.9 trillion, about 22 percent of GDP, for roughly one year (**Chart 31**); meanwhile,

Chart 30  
**Projected SOMA Domestic Securities Holdings**

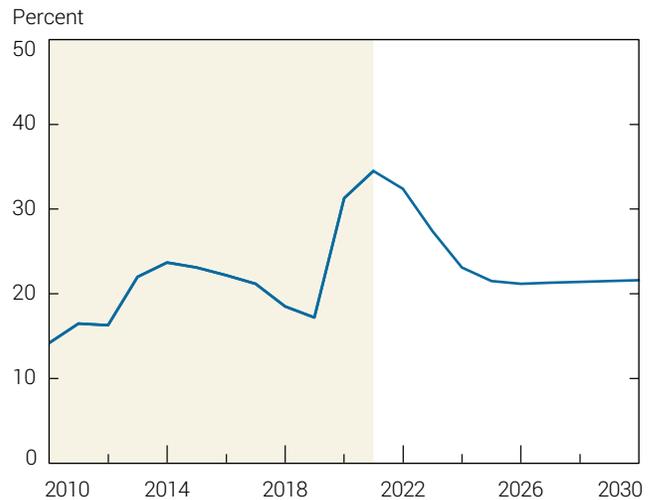


Source: Federal Reserve Bank of New York.

Notes: Figures are as of year-end, and projected figures are rounded. Figures for 2010-21 are shaded and represent historical balances. Although not discernible here, the SOMA is held constant from roughly the middle of 2025 through the middle of 2026.

Projections assumptions are based on publicly available information further detailed in Appendix 4 of this report.

Chart 31  
**Projected SOMA Domestic Securities Holdings as a Share of GDP**



Source: Federal Reserve Bank of New York.

Notes: Figures are as of year-end, and projected figures are rounded. Figures for 2010-21 are shaded and represent historical data.

Projections assumptions are based on publicly available information further detailed in Appendix 4 of this report.

OPEN MARKET OPERATIONS DURING 2021

Chart 32  
Projected Reserve Balances

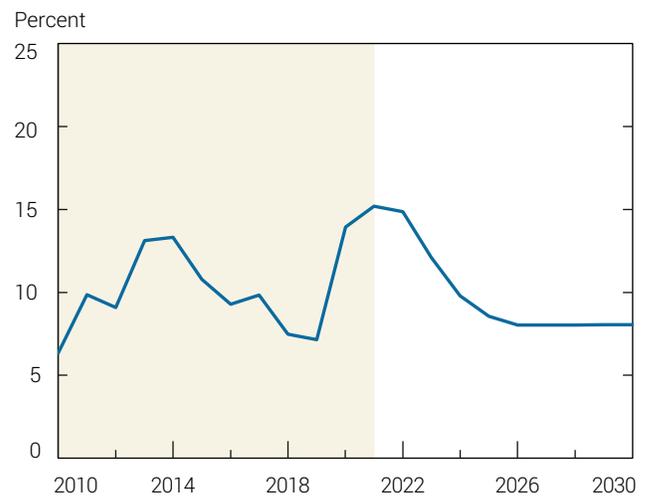


Source: Federal Reserve Bank of New York.

Notes: Figures are as of year-end, and projected figures are rounded. Figures for 2010-21 are shaded and represent historical data.

Projections assumptions are based on publicly available information further detailed in Appendix 4 of this report.

Chart 33  
Projected Reserve Balances as a Share of GDP



Source: Federal Reserve Bank of New York.

Notes: Figures are as of year-end, and projected figures are rounded. Figures for 2010-21 are shaded and represent historical data.

Projections assumptions are based on publicly available information further detailed in Appendix 4 of this report.

reserves continue to decline as most other liabilities continue to grow. Once reserves reach the assumed long-run level, the portfolio resumes growth in mid-2026 to match the assumed growth in demand for Federal Reserve liabilities (**Charts 32 and 33**). By 2030, the SOMA totals \$7.2 trillion, or 22 percent of GDP. While the precise level of the SOMA and reserves in the long run is uncertain due to inherent uncertainty in demand for Federal Reserve liabilities, the dynamics shown here illustrate the broad contours expected to prevail in the coming years.

## PORTFOLIO COMPOSITION

As the SOMA portfolio declines in coming years through the redemption of maturing securities under the caps, the composition of the portfolio is roughly unchanged. Through 2025, the portfolio is composed of roughly 68 percent Treasury securities and 32 percent agency securities. During the period when the portfolio is held constant and resumes growth, the projection assumes that all principal payments from agency MBS are reinvested into Treasury securities—consistent with the Committee’s intention to return to a portfolio composed

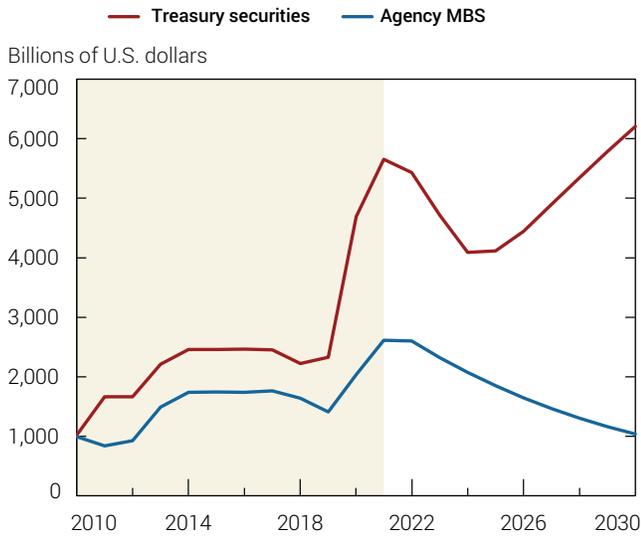
primarily of Treasury securities—and principal payments from Treasury securities are reinvested at auction. When the portfolio resumes growth, new reserve management purchases are assumed to be conducted in Treasury securities. As a result, the proportion of the portfolio allocated to agency securities gradually declines starting in 2025. By 2030, the portfolio is composed of 86 percent Treasury securities and 14 percent agency securities (**Chart 34**).

## SOMA NET INCOME AND REMITTANCES

As discussed earlier in this report, the Federal Reserve remits excess earnings to the U.S. Treasury after providing for the cost of operations, the payment of dividends, and any amount necessary to maintain an aggregate Reserve Bank capital surplus up to a specified limit. SOMA net income—a measure that reflects income and interest expense associated with the SOMA portfolio, including its assumed funding costs—is the primary driver of Federal Reserve remittances. Income reflects coupon income from SOMA holdings, while interest expenses reflect those from interest-bearing

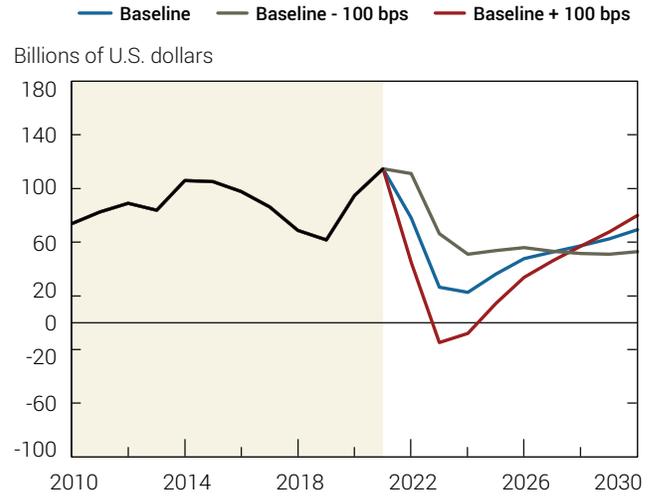
### OPEN MARKET OPERATIONS DURING 2021

Chart 34  
**Projected SOMA Domestic Securities Holdings by Asset Class**



Source: Federal Reserve Bank of New York.  
 Notes: Figures are as of year-end, and projected figures are rounded. Figures for 2010-21 are shaded and represent historical data.  
 Projections assumptions are based on publicly available information further detailed in Appendix 4 of this report.

Chart 35  
**Projected SOMA Net Income**



Source: Federal Reserve Bank of New York.  
 Notes: Figures are as of year-end, and projected figures are rounded. Figures for 2010-21 are shaded and represent historical data.  
 Projections assumptions are based on publicly available information further detailed in Appendix 4 of this report.

liabilities, including reserves and ON RRP. A substantial portion of Federal Reserve liabilities are not remunerated, including currency and the Treasury General Account.

In this projection exercise, SOMA net income is projected to decline notably in the portfolio reduction phase through 2024 (Chart 35).<sup>44</sup> Funding costs associated with reserve balances and the ON RRP increase sharply as a result of interest rate increases, while coupon income declines modestly as the size of the portfolio is reduced. Then, in the reinvestment phase, net income begins to increase as funding costs decrease, in line with the continued decline in reserves, and as reinvestments into higher-yielding securities resume.

To illustrate the sensitivity of SOMA net income to alternative interest rate paths, Chart 35 also shows the outcomes for net income assuming short- and long-term interest rates that are 100 basis points higher and lower than in the baseline. When

interest rates are 100 basis points higher than indicated in the March Desk Surveys, net portfolio income is negative for a short time due to higher funding costs of interest paid on reserves.<sup>45</sup> If interest rates were to rise 200 basis points higher than indicated in the March Surveys, the net portfolio income would be negative for roughly two to three years.<sup>46</sup>

Remittances to the U.S. Treasury are not shown here. However, the projections for net income in higher interest rate scenarios would likely result in the cessation of remittances to the U.S. Treasury for a period of time, and a deferred asset recorded on the Federal Reserve’s balance sheet, reflecting the accumulated net loss.<sup>47</sup> As net income gradually increases above zero, the deferred asset is reduced, and remittances resume once the deferred asset is extinguished.

In the scenarios where interest rates are lower, funding costs fall relative to the baseline, resulting in materially higher net income early in the projection horizon.

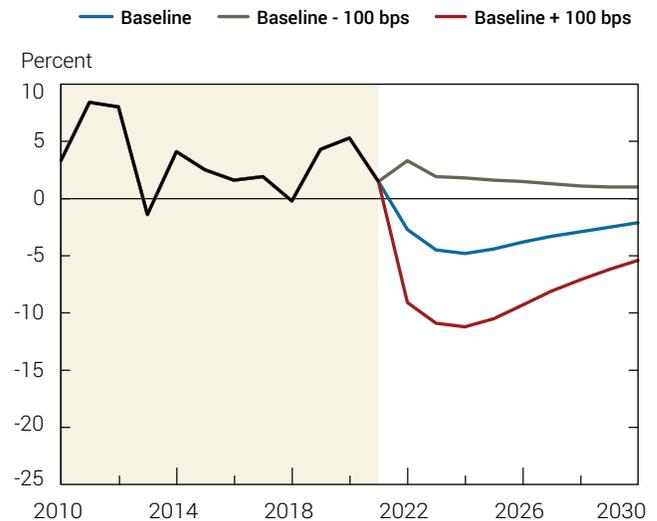
OPEN MARKET OPERATIONS DURING 2021

## SOMA UNREALIZED GAINS AND LOSSES

The market value of securities holdings—and, accordingly, the portfolio's unrealized gains or losses—fluctuates with changes in the prevailing level of market rates for Treasury and agency securities. Importantly, the SOMA portfolio's unrealized gain or loss position does not affect the ability of the Federal Reserve to meet its financial obligations and does not reflect the expected evolution of SOMA net income.<sup>48</sup> Assuming the baseline path of market rates, the current unrealized loss on the portfolio, calculated as the difference between the market value of the portfolio and its book value (which reflects amortized cost), continues to decline through 2023, reaching roughly \$300 billion, or about 5 percent of the par value of the SOMA portfolio (**Chart 36**). This pattern follows the path of assumed Treasury and agency rates, which rise sharply over the period. Toward the end of the horizon, as these rates reach their long-run levels, the unrealized loss begins to decrease as rates stay steady while the portfolio ages.<sup>49</sup>

Similar to the sensitivity of net income, when interest rates are 100 basis points higher than indicated in the March Desk Surveys, the unrealized loss on the portfolio reaches nearly \$800 billion (roughly 11 percent of the portfolio). If interest rates were to rise 200 basis points higher than indicated in the March Desk Surveys, the unrealized loss would be much higher.<sup>50</sup> These figures are included in the data file associated with this report. As noted earlier, the Federal Reserve's earnings, gains, or losses have no impact on its ability to fulfill its financial obligations or implement monetary policy in pursuit of its statutory goals.

Chart 36  
Projected SOMA Unrealized Gains and Losses as a Share of the SOMA Portfolio



Source: Federal Reserve Bank of New York.

Notes: Figures are as of year-end, and projected figures are rounded. Figures for 2010-21 are shaded and represent historical data.

Projections assumptions are based on publicly available information further detailed in Appendix 4 of this report.

### OPEN MARKET OPERATIONS DURING 2021

# COUNTERPARTIES

The New York Fed relies on a robust network of trading counterparties to supply the necessary operational capacity to execute domestic and foreign open market operations. This network of counterparties is diverse and geographically dispersed to ensure that the New York Fed can continue to conduct open market operations in a range of scenarios.<sup>51</sup> From time to time, the Desk revisits its counterparty policies to ensure that they promote a fair and competitive marketplace and that they continue to support effective implementation of monetary policy.

## PRIMARY DEALERS

Primary dealers are trading counterparties of the New York Fed in its implementation of monetary policy and are expected to participate consistently and competitively in open market operations. They are also expected to make markets for the New York Fed on behalf of its official account holders as needed, and to bid on a pro rata basis in all Treasury auctions at reasonably competitive prices.<sup>52</sup> The New York Fed also expects primary dealers to provide ongoing insight into market developments in the daily market monitoring activities that the Desk conducts to support the formulation and implementation of monetary policy. As of December 31, 2021, there were twenty-four primary dealers. Although the total number of primary dealers remained unchanged from 2020, one primary dealer switched its dealership from its U.S. broker-dealer to a U.S. bank branch.

## AGENCY CMBS COUNTERPARTIES

For its CMBS operations, the Desk used a diverse set of counterparties, including primary dealers and a range of other broker-dealers including minority-, women-, or

veteran-owned firms, all of which helped ensure effective execution of CMBS operations.<sup>53</sup> In 2021, the New York Fed approved three additional agency CMBS counterparties. As noted previously, the FOMC terminated its directive to purchase agency CMBS in November.

## REVERSE REPURCHASE AGREEMENT COUNTERPARTIES

To enhance its ability to support the monetary policy objectives of the FOMC, the New York Fed has arrangements with an expanded set of counterparties with whom the Desk can conduct reverse repo transactions. These counterparties—which include money market funds, GSEs, and banks—augment the existing set of primary dealer counterparties with which the New York Fed can conduct reverse repos. In April, to allow for broader participation in its ON RRP operations, the Desk adjusted its RRP counterparty criteria by eliminating minimum thresholds for GSEs and reducing net asset value and reverse repo balance thresholds for MMFs. The changes to counterparty eligibility criteria are designed to make the ON RRP facility more accessible, in line with the New York Fed's efforts to ensure that its counterparty policies both support effective policy implementation and promote a fair and competitive marketplace. During 2021, the Desk added nine ON RRP counterparties, increasing the diversity of the counterparty base. As of December 31, 2021, there were 129 expanded RRP counterparties, comprising ninety-nine money market funds from twenty-nine investment management firms, fifteen GSEs, and fifteen banks.

## STANDING REPURCHASE AGREEMENT FACILITY COUNTERPARTIES

In addition to primary dealers, participation in the SRF is open to depository institutions that meet current eligibility requirements. On December 17, the New York Fed announced the addition of three depository institution SRF counterparties.

## FOREIGN EXCHANGE COUNTERPARTIES

Foreign exchange counterparties are trading counterparties of the New York Fed in its foreign exchange operations conducted on behalf of the Federal Reserve and the U.S. Treasury. These counterparties are expected to provide competitive two-way pricing, as needed, to support the Desk's periodic foreign exchange operations as well as service the Desk's transactions that relate to the currency needs of the New York Fed's official account holders and agencies of the U.S. government. In addition, the New York Fed relies on its foreign exchange counterparties for ongoing insight into global financial market developments as it conducts daily market monitoring activities to support the formulation and implementation of policy by U.S. monetary authorities. As of December 31, 2021, there were twenty-one foreign exchange counterparties.

## FOREIGN RESERVES MANAGEMENT COUNTERPARTIES

The New York Fed transacts with foreign reserves management counterparties to invest the foreign currency reserves of the Federal Reserve and the U.S. Treasury. These counterparties are expected to participate consistently and competitively in the Desk's periodic investment operations. As of December 31, 2021, there were twenty-four foreign reserves management counterparties, representing sixteen parent financial firms.

## EMERGENCY CREDIT AND LIQUIDITY FACILITIES COUNTERPARTIES

The emergency credit and liquidity facilities launched in 2020 in response to the COVID-19 pandemic included a wide range of counterparties. In 2021, the New York Fed continued to add counterparties to support certain of these facilities. Nine additional firms were onboarded in 2021, including eight new counterparties for the SMCCF and one new dealer for the CPFF.<sup>54</sup> Over the life of these facilities, counterparties encompassed a diverse set of firms by size, business model, and ownership profile, including minority-, women-, or veteran-owned broker-dealers, regional bank-affiliated broker-dealers, independent broker-dealers, and broker-dealers affiliated with electronic trading platforms. The addition of these counterparties helped support effective trade execution, including the sales of the SMCCF's portfolio holdings that took place from June to August 2021.

### OPEN MARKET OPERATIONS DURING 2021

Box 2

## INDUSTRY TRANSITION AWAY FROM USD LIBOR AND TOWARD SOFR

Following a multiyear effort prompted by concerns that continued use of LIBOR posed financial stability risks, 2021 marked a key year in the transition away from LIBOR. Publication of a range of LIBOR tenors, including less frequently used one-week and two-month U.S. dollar (USD) LIBOR tenors, ceased immediately after December 31, 2021. In addition, while the publication of remaining USD LIBOR tenors is set to cease immediately after June 30, 2023, their continued publication is primarily intended to allow legacy contracts to mature naturally and is not intended to support the use of USD LIBOR in new contracts after the end of 2021. Specifically, U.S. supervisory guidance encouraged banks to cease entering into new contracts that use USD LIBOR as a reference rate by December 31, 2021, noting that use after that date posed safety and soundness risks.<sup>a</sup>

The Alternative Reference Rates Committee (ARRC) is the industry body convened by the Federal Reserve Board and the New York Fed to help ensure a

successful transition from USD LIBOR. It has recommended SOFR as its preferred alternative to USD LIBOR. The ARRC released a progress report in late 2021 that noted considerable progress in the transition away from USD LIBOR to SOFR in cash and derivatives markets heading into the 2021 year-end deadline.<sup>b</sup> Areas of progress highlighted in the report included sharp growth in SOFR swaps volumes, further consolidation of SOFR use in debt and mortgage markets, and growth in the issuance of SOFR-linked loans. Looking forward, the ARRC indicated that it would be monitoring the further adoption of SOFR, including the shift out of Eurodollar futures and into SOFR futures, and that it would continue to support the transition of legacy contracts ahead of mid-2023, including work to support legislative solutions for legacy contracts. Overall, the ARRC noted that “the momentum now underway from USD LIBOR towards SOFR will put the global financial system on a more stable and enduring foundation, with a rate

that is transparent, well-designed, and grounded in market transactions.”

In July 2021, the New York Fed, in connection with its role as benchmark administrator for SOFR, published a statement of its compliance with the International Organization of Securities Commissions (IOSCO) Principles for Financial Benchmarks.<sup>c</sup> As a matter of policy, the New York Fed is committed to administering SOFR and other benchmarks in a manner consistent with the principles.

With respect to its own market operations, the New York Fed worked with its counterparties to amend its relevant counterparty contracts to remove any existing references to LIBOR and to replace them with references to alternative benchmark rates, specifically to forms of SOFR. Making these changes was consistent with the goal of the industry transition away from LIBOR to more robust benchmark reference rates, both in order to reduce vulnerabilities associated with LIBOR and to promote sustained global financial stability.

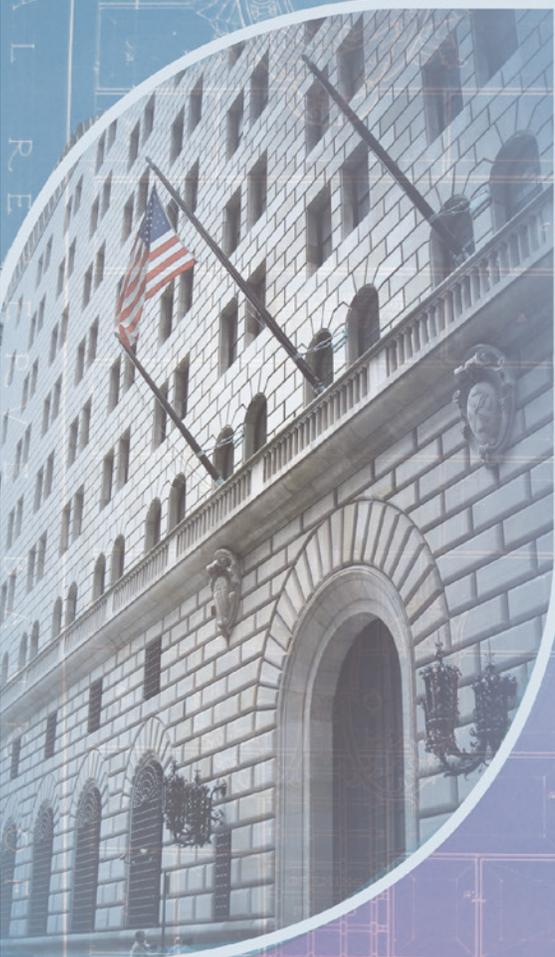
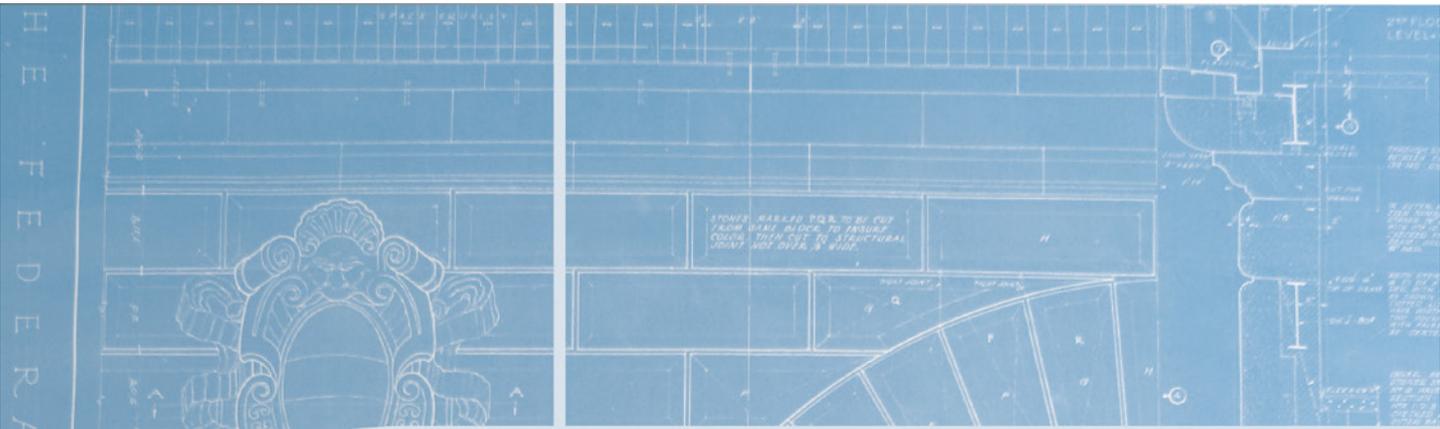
<sup>a</sup> See Federal Reserve Board, “Agencies Issue Statement on LIBOR Transition,” November 30, 2020, at <https://www.federalreserve.gov/newsevents/pressreleases/bcreg20201130a.htm>.

<sup>b</sup> See Alternative Reference Rates Committee, “Year-End Progress Report: The Transition from U.S. Dollar LIBOR,” December 2021, at <https://www.newyorkfed.org/medialibrary/Microsites/arrc/files/2021/20211216-ARRC-Press-Release-Year-End-Progress-Report.pdf>.

<sup>c</sup> See <https://www.newyorkfed.org/medialibrary/media/markets/IOSCO-statement-of-compliance-jul2021>.

### OPEN MARKET OPERATIONS DURING 2021

THE FEDERAL RESERVE



# OPERATIONAL FLEXIBILITY AND RESILIENCY

Over the course of 2021, the New York Fed remained in its predominantly work-from-home posture that began in 2020 and continued efforts to enhance its operational flexibility and resiliency by maintaining a robust and geographically dispersed network of counterparties (as described in the previous section) and operational capabilities. The New York Fed's remote capabilities ensured that the Desk was able to conduct operations to implement monetary policy in accordance with FOMC directives throughout 2021. In addition, the Desk continued to undertake operational readiness exercises and initiatives to enhance cyber resiliency.

## OPERATIONAL READINESS

The Desk continued its practice of conducting small-value transaction exercises of certain domestic and foreign SOMA operations for the purpose of maintaining operational readiness. During these exercises, transactions were conducted end-to-end, from trade execution through settlement, and were modest in size. These exercises test the operational capability to execute a range of operation types that may be required to effectively implement future policy directives; however, conducting these operations should not be interpreted as a signal about the future timing or direction of changes in policy.

The Desk also conducts small-value exercises as part of its contingency preparedness efforts, using backup tools for certain ongoing critical operations. These exercises test the Desk's ability to execute these critical operations under a scenario in which primary tools such as the proprietary FedTrade electronic trading platform are unavailable. In 2021, testing of backup tools covered ON RRP, overnight repos, and securities lending operations.

The benefit of conducting small-value exercises and undertaking other planning exercises to maintain operational readiness was especially evident in recent years as the Desk expeditiously implemented policy directives to address market stress related to the COVID-19 pandemic. Looking ahead, these activities will remain important components of the Desk's efforts to maintain operational readiness to respond to evolving policy environments.

Consistent with the Authorization for Domestic Open Market Operations approved by the FOMC, the aggregate par value of domestic outright operations conducted for the purpose of testing operational readiness did not exceed the limit of \$5 billion per calendar year, and the outstanding amount of repo and reverse repo transactions conducted for this purpose did not exceed \$5 billion at any given time. Domestic small-value exercises were announced in advance and the operation results were posted on the New York Fed's website (**Table 5**). The aggregate amount of foreign currency operations conducted for the purpose of testing operational readiness did not exceed the limit of \$2.5 billion per calendar year (**Table 6**) specified in the Authorization for Foreign Currency Operations. The results of small-value central bank liquidity swap transactions were posted on the New York Fed's website.

## OPERATIONAL AND CYBER RESILIENCY

The Federal Reserve, its counterparties, and its customers operate in an increasingly complex environment in which trading and payment systems and an information infrastructure of growing sophistication open up new opportunities to obtain and manage information, conduct business, and communicate. During 2021,

Table 5

**Small-Value Exercise Results in 2021: Domestic Operations**

Operation Type	Time Frame	Operation Amount (Millions of U.S. Dollars)
Treasury outright sales	First half	25
	Second half	25
Agency MBS outright sales	First half	168
	Second half	83
Agency MBS coupon swaps	First half	20
	Second half	20
Overnight repurchase agreement with back-up tool	First half	46
Overnight reverse repurchase agreement with back-up tool	First half	77
Securities lending with back-up tool	First half	67
	Second half	63

Source: Federal Reserve Bank of New York.

Notes: Figures may be rounded. Further details for each small-value exercise are available on the [Federal Reserve Bank of New York's website](#).

the impact of the pandemic continued to present significant operational challenges, as the Federal Reserve and the majority of its service providers, counterparties, and customers maintained a full or partial work-from-home posture. In the latter half of 2021, the New York Fed implemented a partial “return to the office” program. This approach provided additional technology and operational assurance since some portions of Desk operations were conducted from the office. The New York Fed’s near-term objective is to operate a hybrid model with staff working remotely and at the office, which enhances overall resilience and flexibility as COVID-19-related health risks and safety protocols evolve.

As part of a long-standing commitment to proactively manage security risks, the Federal Reserve has continually invested in initiatives to improve physical and information security while also enhancing operational resilience, including collecting and analyzing threat intelligence, implementing defensive measures, and augmenting its detective and reactive capabilities. In recent years, the New York Fed has enhanced the resiliency of its operational infrastructure through initiatives that have added

protections for key transactional systems to address risks posed by cyber threats. Relatedly, the New York Fed continues to annually attest to the SWIFT Customer Security Programme (CSP) rolled out in 2017. Cyber resilience remained at the forefront of risk management during 2021 with media reporting numerous cyber events at a range of institutions and industries. The New York Fed continues to progress on its Cyber Security Strategy by articulating strategic choices and prioritizing investments to enhance its resiliency against cyberattacks.

## GEOGRAPHIC RESILIENCY

In the event of wide-scale disruptions in large metropolitan areas (in particular, the New York region, where many market participants are located), the Federal Reserve must continue to conduct open market operations and settlement activities. In 2021, the Desk continued to maintain its operational flexibility and resiliency by maintaining a robust, geographically dispersed network of counterparties and operating capabilities to support Desk operations.

### OPEN MARKET OPERATIONS DURING 2021

Table 6

**Small-Value Exercise Results in 2021: Foreign Operations**

Operation Type	Time Frame	Operation Amount
Euro-denominated repurchase agreements	First half	€6.0 million
	Second half	€3.0 million
Euro-denominated sovereign debt sales	First half	€2.4 million
	Second half	€1.2 million
Euro-denominated sovereign debt purchases	First half	€2.4 million
	Second half	€1.2 million
Early liquidation of euro-denominated term deposit at official institution	Second half	€2.0 million
Yen-denominated sovereign debt sales	First half	¥600 million
	Second half	¥300 million
Yen-denominated sovereign debt purchases	First half	¥600 million
	Second half	¥300 million
U.S. dollar liquidity swaps with standing swap line central banks	Second half	\$222,000
Foreign currency liquidity swaps		
Swiss National Bank	First half	CHF 51,000
Bank of Canada	First half	CAD 51,000
Bank of England	Second half	£51,000
European Central Bank	First half	€ 10,000
Bank of Japan	Second half	¥51,000

Source: Federal Reserve Bank of New York.

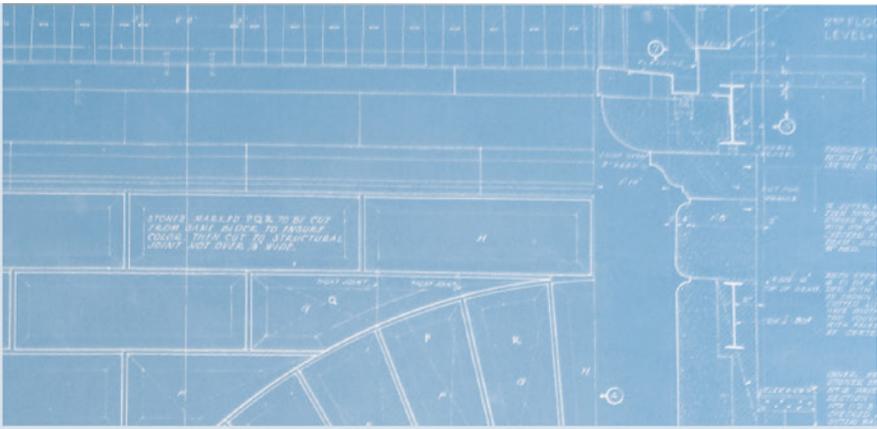
Notes: Figures may be rounded. Further details for each small-value exercise are available on the [Federal Reserve Bank of New York's website](#).

To sustain the resiliency of the Desk's operations, the New York Fed operates alternative sites for trading and settlement of open market operations in other Reserve Bank locations across the Federal Reserve System. These arrangements ensure that the Desk has the resources needed to carry out critical operational and analytical activities

should a contingency scenario affect the greater New York area. Similarly, all primary dealers have established and regularly tested geographically dispersed primary and secondary locations to ensure that robust end-to-end participation in open market operations would still be possible amid any wide-scale disruption.

## OPEN MARKET OPERATIONS DURING 2021

THE FEDERAL RESERVE



# APPENDIX 1:

## Terms for Desk Operations

The following tables summarize the key terms for Desk operations as they were implemented in 2021. For more information on each open market operation, including

frequently asked questions (FAQs), visit the Markets & Policy Implementation page of the New York Fed's website, at <https://www.newyorkfed.org/markets>.

### Overnight Reverse Repurchase Agreements

For more information, visit the FAQs at [https://www.newyorkfed.org/markets/rrp\\_faq](https://www.newyorkfed.org/markets/rrp_faq).

Term	Overnight
Eligible securities	U.S. Treasury securities
Counterparties	Primary dealers, eligible 2a-7 money market funds, government-sponsored enterprises (GSEs), and banks
Aggregate operation limit	These operations were limited by the value of Treasury securities held outright in the SOMA that was available for such operations.
Frequency	Daily
Per counterparty limit	One proposition per counterparty in an amount not to exceed the per counterparty limit <ul style="list-style-type: none"> <li>• January 1 to March 17: \$30 billion</li> <li>• March 18 to September 22: \$80 billion</li> <li>• September 23 to December 31: \$160 billion</li> </ul>
Maximum offer rate	January 1 to June 16: 0 percent June 17 to December 31: 0.05 percent
Offer submission	Counterparty proposition not to exceed offering rate
Awards	The ON RRP facility is conducted as a fixed-price, single-price auction. If the total amount of propositions received was less than or equal to the amount of available securities, all awards were made at the specified offer rate to all counterparties that submitted propositions. In the highly unlikely event that the value of propositions received exceeded the amount of available securities, awards would be made at the rate at which this size limit was achieved (the stop-out rate), with all propositions below this rate awarded in full and all propositions equal to this rate awarded on a pro rata basis.
Execution platform	FedTrade, the Desk's proprietary trading platform

#### OPEN MARKET OPERATIONS DURING 2021

## Repurchase Agreements

### Overnight and Term Repurchase Agreements

For more information, visit the FAQs at <https://www.newyorkfed.org/markets/domestic-market-operations/monetary-policy-implementation/repo-reverse-repo-agreements>.

Term	Overnight (until July 28, 2021) 28 day (until February 9, 2021)
Eligible securities	U.S. Treasury securities, agency debt securities, and agency MBS
Counterparties	Primary dealers
Aggregate operation limit	\$500 billion
Frequency	Overnight: daily until July 28, 2021 Term: weekly until February 9, 2021
Per counterparty limit	Two propositions up to \$20 billion per eligible security type
Minimum bid rate	Overnight: IOER (IORB) plus 5 basis points Term: IOER plus 10 basis points
Awards	Repo operations are auctions conducted in a multiple-price format. If the total amount bid in an individual operation was less than or equal to the aggregate operation limit, all propositions were accepted at their submitted rates. If the aggregate amount bid exceeded the aggregate operation limit, bids were accepted at their submitted rates starting with the highest rate bid relative to the benchmark rate set internally for each collateral type and working down until the aggregate operation limit was reached. After that, individual propositions were either partially awarded or not awarded based on their proximity to those benchmark rates for each security type.
Execution platform	FedTrade, the Desk's proprietary trading platform

### Standing Repurchase Agreement Facility (effective July 29, 2021)

For more information, visit the FAQs at <https://www.newyorkfed.org/markets/repo-agreement-ops-faq>.

Term	Overnight
Eligible securities	U.S. Treasury securities, agency debt securities, and agency MBS
Counterparties	Primary dealers and eligible depository institutions
Aggregate operation limit	\$500 billion
Frequency	Daily
Per counterparty limit	Two propositions of up to \$20 billion per eligible security type at rates no lower than the minimum bid rates

## OPEN MARKET OPERATIONS DURING 2021

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Minimum bid rate	0.25 percent
Awards	SRF operations are auctions conducted in a multiple-price format. If the total amount bid in an individual operation was less than or equal to the aggregate operation limit, all propositions were accepted at their submitted rates. If the aggregate amount bid exceeded the aggregate operation limit, propositions were accepted at their submitted rates starting with the highest-rate bid relative to the benchmark rate set internally for each security type and working down until the aggregate operation limit was reached. After that, individual propositions were either partially awarded or not awarded based on their proximity to those benchmark rates for each security type.
Execution platform	FedTrade, the Desk's proprietary trading platform

## Central Bank Liquidity Swaps

For more information, visit the FAQs at <https://www.federalreserve.gov/newsevents/pressreleases/swap-lines-faqs.htm>.

Maturity	Up to 88 days
Counterparties	<ul style="list-style-type: none"> <li>Foreign central banks with standing swap line arrangements</li> <li>Foreign central banks with temporary swap line arrangements (expired December 31, 2021)</li> </ul>
Frequency	<p>The central bank liquidity swap counterparties hold U.S. dollar liquidity-providing operations according to a schedule pre-approved by the Chair of the FOMC.</p> <p>For participating standing swap central banks, one-week maturity operations were offered weekly throughout 2021. Three-month maturity operations were conducted weekly from January 1 through June 30.</p>
Per counterparty limit	<ul style="list-style-type: none"> <li>Standing swap central banks: no per counterparty limit is specified</li> <li>Temporary swap central banks: up to \$60 billion each for the Reserve Bank of Australia, the Banco Central do Brasil, the Bank of Korea, the Banco de México, the Monetary Authority of Singapore, and the Sveriges Riksbank; \$30 billion each for the Danmarks Nationalbank, the Norges Bank, and the Reserve Bank of New Zealand</li> </ul>
Price	For pricing details of liquidity swap operations for standing and temporary swap counterparties, see operation results at <a href="https://www.newyorkfed.org/markets/desk-operations/central-bank-liquidity-swap-operations">https://www.newyorkfed.org/markets/desk-operations/central-bank-liquidity-swap-operations</a> .

### OPEN MARKET OPERATIONS DURING 2021

## Outright Treasury Purchases

### Treasury Security Asset Purchases

For more information, visit the FAQs at <https://www.newyorkfed.org/markets/treasury-reinvestments-purchases-faq.html>.

Counterparties	Primary dealers
Eligible securities	All outstanding U.S. Treasury securities
Operation size and frequency	The Desk published a tentative schedule of operations each month, detailing operation dates and times, the security types and maturity range, and maximum purchase amount for each operation.
Holdings limits	SOMA holdings were limited to a maximum of 70 percent of the total outstanding amount of any individual Treasury security.
Excluded securities	Securities trading with heightened scarcity value in the repo market for specific collateral, newly issued nominal coupon securities, securities that were cheapest to deliver into active Treasury futures contracts, cash management bills, TIPS with one year or less to maturity, other securities with four weeks or less to maturity, STRIPS, and securities trading in the when-issued market. The specific issues excluded from consideration were announced at the start of each operation.
Offer submission	Counterparties were allowed to submit nine propositions per security across the range of eligible securities for an operation.
Awards	Offers were evaluated based on their proximity to prevailing market prices at the close of the multiple-price auction, as well as measures of relative value. Relative value measures were calculated using the New York Fed's proprietary model.
Execution platform	FedTrade, the Desk's proprietary trading platform

### Reinvestments of Treasury Securities

For more information, visit the FAQs at <https://www.newyorkfed.org/markets/treasury-rollover-faq.html>

Counterparties	U.S. Treasury
Eligible securities	All securities issued at auction by the U.S. Treasury
Operation size and frequency	The value of all maturing Treasury securities was rolled over at each auction into newly issued securities. Reinvestments were allocated proportionally across new issues by the announced offering amounts.
Holdings limits	SOMA holdings were limited to a maximum of 70 percent of the total outstanding amount of any individual Treasury security.
Bid submission	The Desk places noncompetitive bids for the SOMA portfolio at Treasury auctions equal in par amount to the value of holdings maturing on the issue date of the securities being auctioned. These bids were treated as add-ons to announced auction sizes.

## OPEN MARKET OPERATIONS DURING 2021

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Awards	Noncompetitive bidders receive the stop-out rate, yield, or discount margin determined by the competitive auction process.
Execution platform	TAAPs, the New York Fed's auction platform for issuance of Treasury securities

### Securities Lending

For more information, visit the FAQs at [https://www.newyorkfed.org/markets/sec\\_faq.htm](https://www.newyorkfed.org/markets/sec_faq.htm)

Term	Overnight
Eligible securities	U.S. Treasury securities (for securities loaned and collateral received)
Counterparties	Primary dealers
Aggregate operation limit	The value of Treasury and agency debt securities held outright in the SOMA that was available for such operations
Frequency	Daily
Aggregate lending limit	Ninety percent of each Treasury and agency debt security owned by the SOMA with a maturity of greater than thirteen days was available for lending each day ("theoretical amount" available to borrow).
Per counterparty limit	Maximum of 25 percent of theoretical supply available to borrow per issue and \$5 billion total par in outstanding securities loans at any one time.
Per issue bid limit	Up to two bids per issue
Fee	Primary dealers bid a fee to borrow the security; the fee is economically equivalent to a spread between the overnight general collateral repo rate and the overnight specials rate for the borrowed security. The minimum fee is 5 basis points.
Awards	Based on competitive bidding in a multiple-price auction held for each security at noon each business day
Execution platform	FedTrade, the Desk's proprietary trading platform

## OPEN MARKET OPERATIONS DURING 2021

## Agency MBS

### Asset Purchases including Reinvestment Purchases

For more information, visit the FAQs at <https://www.newyorkfed.org/markets/ambs-treasury-faq>

Counterparties	Primary dealers that transact in the agency MBS market
Eligible securities	MBS guaranteed by Fannie Mae, Freddie Mac, and Ginnie Mae
Operation size and frequency	The Desk published a tentative schedule of planned agency MBS operations approximately every two weeks, detailing operation dates and times, the type of securities to be purchased (including agency, term, and coupon), and the maximum purchase amounts.
Excluded securities	No specific exclusions
Offer submission	Counterparties were allowed to submit up to ten offers per TBA security across the range of eligible securities in a multiple-price auction, meaning that each offer at or below the stop-out rate was transacted at the offer rate.
Awards	Offers were evaluated based on their proximity to prevailing market prices at the auction close.
Execution platform	FedTrade, the Desk's proprietary trading platform

### Dollar Rolls

Term	One month
Eligible securities	Agency MBS
Counterparties	Primary dealers that transact in the agency MBS market
Operation size	As appropriate to facilitate settlement associated with the Federal Reserve's agency MBS transactions
Frequency	As appropriate to facilitate settlement associated with the Federal Reserve's agency MBS transactions
Counterparty limits	Not applicable
Bid submission	Request for quote from dealers for dollar amount financed
Awards	Best price
Execution platform	Tradeweb, a commercial trading platform

## OPEN MARKET OPERATIONS DURING 2021

## Agency CMBS (terminated November 4, 2021)

For more information, visit the FAQs at <https://www.newyorkfed.org/markets/domestic-market-operations/monetary-policy-implementation/agency-commercial-mortgage-backed-securities/agency-commercial-mortgage-backed-securities-faq>.

Counterparties	Subset of primary dealers and other approved broker-dealers
Eligible securities	Fannie Mae DUS, Freddie Mac K Series, Ginnie Mae Project Loans
Operation size and frequency	The Desk published a tentative schedule of planned agency CMBS operations approximately every one to two weeks, detailing operation dates and times, the type of securities to be purchased, and the maximum purchase amounts.
Offer submission	No specific limitation
Excluded securities	Re-securitization of real estate mortgage investment conduits (Re-REMICS), interest-only certificates, principal-only certificates, and residual certificates
Awards	Operations are conducted using a multiple-price auction. Offers were evaluated based on their relative value to market prices. Relative value measures were calculated by evaluating risk characteristics and competitiveness of offers compared to market pricing.
Execution platform	BlackRock Financial Markets Advisory executed trades with approved counterparties on behalf of the Desk.

## Foreign Reserves Management

For more information, see <https://www.newyorkfed.org/markets/international-market-operations/foreign-reserves-management>.

Counterparties	Foreign Reserves Management counterparties
Eligible assets	The SOMA's foreign currency reserves may be invested on an outright basis in German, French, Dutch, and Japanese government securities, as well as in deposits at the Bank for International Settlements and at foreign central banks such as the Deutsche Bundesbank, Banque de France, De Nederlandsche Bank, and Bank of Japan.
Execution platform	Tradeweb and Bloomberg, commercial trading platforms; voice trading.

### OPEN MARKET OPERATIONS DURING 2021

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## APPENDIX 2:

### Governing Documents

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#### AUTHORIZATION FOR DOMESTIC OPEN MARKET OPERATIONS

On January 26, 2021, by unanimous vote, the FOMC voted to reaffirm the Authorization for Domestic Open Market Operations.

[https://www.federalreserve.gov/monetarypolicy/files/FOMC\\_RulesAuthPamphlet\\_202101.pdf](https://www.federalreserve.gov/monetarypolicy/files/FOMC_RulesAuthPamphlet_202101.pdf)

*See page 50: Authorization for Domestic Open Market Operations*

#### GUIDELINES FOR THE CONDUCT OF SYSTEM OPEN MARKET OPERATIONS IN FEDERAL-AGENCY ISSUES

The Guidelines for the Conduct of System Open Market Operations in Federal-Agency Issues, which were temporarily suspended on January 27, 2009, remained suspended throughout 2021.

[https://www.federalreserve.gov/monetarypolicy/files/FOMC\\_FederalAgencyIssues.pdf](https://www.federalreserve.gov/monetarypolicy/files/FOMC_FederalAgencyIssues.pdf)

#### DOMESTIC POLICY DIRECTIVES ISSUED TO THE FEDERAL RESERVE BANK OF NEW YORK

In 2021, the FOMC authorized and directed the Open Market Desk at the Federal Reserve Bank of New York to execute transactions in the SOMA in accordance with domestic policy directives. The following is a list of links to the domestic policy directives issued by the FOMC from January 1 to December 31.

##### Open Market Operations from January 1 to January 27

The FOMC issued the following domestic policy directive on December 16, 2020.

<https://www.federalreserve.gov/newsevents/pressreleases/monetary20201216a1.htm>

##### Open Market Operations from January 28 to March 17

The FOMC issued the following domestic policy directive on January 27, 2021.

<https://www.federalreserve.gov/newsevents/pressreleases/monetary20210127a1.htm>

##### Open Market Operations from March 18 to April 28

The FOMC issued the following domestic policy directive on March 17, 2021.

<https://www.federalreserve.gov/newsevents/pressreleases/monetary20210317a1.htm>

##### Open Market Operations from April 29 to June 16

The FOMC issued the following domestic policy directive on April 28, 2021.

<https://www.federalreserve.gov/newsevents/pressreleases/monetary20210428a1.htm>

##### Open Market Operations from June 17 to July 28

The FOMC issued the following domestic policy directive on June 16, 2021.

<https://www.federalreserve.gov/newsevents/pressreleases/monetary20210616a1.htm>

##### Open Market Operations from July 29 to September 22

The FOMC issued the following domestic policy directive on July 28, 2021.

<https://www.federalreserve.gov/newsevents/pressreleases/monetary20210728a1.htm>

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#### OPEN MARKET OPERATIONS DURING 2021

### Open Market Operations from September 23 to November 3

The FOMC issued the following domestic policy directive on September 22, 2021.

<https://www.federalreserve.gov/newsevents/pressreleases/monetary20210922a1.htm>

### Open Market Operations from November 4 to December 15

The FOMC issued the following domestic policy directive on November 3, 2021.

<https://www.federalreserve.gov/newsevents/pressreleases/monetary20211103a1.htm>

### Open Market Operations from December 16 to December 31

The FOMC issued the following domestic policy directive on December 15, 2021.

<https://www.federalreserve.gov/newsevents/pressreleases/monetary20211215a1.htm>

### STANDING REPURCHASE AGREEMENT FACILITY RESOLUTION

On July 27, 2021, by unanimous vote, the FOMC voted to

establish the Standing Repurchase Agreement Facility. The public announcement was on the following day.

[https://www.federalreserve.gov/monetarypolicy/files/FOMC\\_StandingRepoFacilityResolution.pdf](https://www.federalreserve.gov/monetarypolicy/files/FOMC_StandingRepoFacilityResolution.pdf)

### STANDING FIMA REPURCHASE AGREEMENT RESOLUTION

On July 27, 2021, the FOMC voted to establish the Standing FIMA Repurchase Agreement Facility. The public announcement was on the following day.

[https://www.federalreserve.gov/monetarypolicy/files/FOMC\\_StandingFIMAREpoResolution.pdf](https://www.federalreserve.gov/monetarypolicy/files/FOMC_StandingFIMAREpoResolution.pdf)

### AUTHORIZATION FOR FOREIGN CURRENCY OPERATIONS AND FOREIGN CURRENCY DIRECTIVE

On January 26, 2021, by unanimous vote, the FOMC voted to reaffirm without change the Authorization for Foreign Currency Operations and the Foreign Currency Directive.

[https://www.federalreserve.gov/monetarypolicy/files/FOMC\\_RulesAuthPamphlet\\_202101.pdf](https://www.federalreserve.gov/monetarypolicy/files/FOMC_RulesAuthPamphlet_202101.pdf)

See: *Page 52: Authorization for Foreign Currency Operations*  
*Page 56: Foreign Currency Directive*

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## APPENDIX 3:

### Operations Disclosures

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The following table summarizes the types of information disclosed by the Desk about various SOMA operations. To access the data listed in the table, visit the Markets Data Dashboard on the

New York Fed's website, at <https://www.newyorkfed.org/markets/data-hub>. For Treasury data, see [https://www.treasurydirect.gov/instit/annceresult/annceresult\\_query.htm](https://www.treasurydirect.gov/instit/annceresult/annceresult_query.htm).

#### OPEN MARKET OPERATIONS DURING 2021

## Operations Disclosures

Operation Type	Operation Schedule	Operation Results	Additional Operations Data <sup>a</sup>	Transaction Data <sup>b</sup>
<b>Domestic open market operations</b>				
Overnight repo	✓	✓	✓	✓
Term repo	✓	✓	✓	✓
Standing Repo Facility (SRF)	c	✓	✓	✓
Overnight reverse repo	c	✓	✓	✓
Treasury outright purchases	✓	✓	✓	✓
Treasury rollovers		✓ <sup>d</sup>		
Treasury rollovers with bills		✓ <sup>d</sup>		
Treasury securities lending	c	✓	✓	✓
Agency MBS outright purchases	✓	✓	✓	✓
Agency MBS dollar rolls		✓	✓	✓
Agency CMBS purchases	✓	✓	✓	✓
<b>Foreign open market operations</b>				
Foreign sovereign debt purchases				✓
Central bank liquidity swaps			✓ <sup>e</sup>	
<b>Small-value exercises</b>				
Repos	✓	✓	✓	✓
Reverse repos	✓	✓	✓	✓
Treasury outright sales	✓	✓	✓	✓
Securities lending	✓	✓		✓
Agency MBS outright sales	✓	✓	✓	✓
Agency MBS coupon swaps	✓	✓	✓	✓
Foreign sovereign debt sales				✓
Foreign sovereign debt purchases				✓
Foreign currency repos <sup>f</sup>				✓
<b>Foreign deposit liquidation</b>				

Source: Federal Reserve Bank of New York.

<sup>a</sup>Additional data could include details about types of counterparties, pricing, and higher-frequency transaction data.

<sup>b</sup>The New York Fed discloses transaction data with market counterparties on a quarterly basis with a two-year lag, in accordance with the Dodd-Frank Act. Details include: the date and amount of the transaction; the counterparty to the transaction; the price, interest rate, or exchange rate at which the transaction was conducted; other relevant terms; and for certain types of transactions, information about the collateral.

<sup>c</sup>Since overnight RRP, SRF, and Treasury securities lending are daily facilities, a regular calendar is not released; schedule changes are typically announced at least one business day prior to the operation. Note the SRF was established in July 2021 (see <https://www.federalreserve.gov/newsevents/pressreleases/monetary20210728b.htm>).

<sup>d</sup>SOMA awards are released by the U.S. Treasury after each auction.

<sup>e</sup>Transactions between the New York Fed and foreign central bank counterparties are reported weekly by the New York Fed; foreign central banks' operation results are reported immediately after the completion of their respective auctions.

<sup>f</sup>In the Dodd-Frank Act transaction data disclosures for foreign currency repos and foreign currency reverse repos, the transaction category is reclassified to match the perspective of the New York Fed's counterparty.

### OPEN MARKET OPERATIONS DURING 2021

## APPENDIX 4:

### Summary of Projection Assumptions

The assumptions underlying the scenarios for the SOMA portfolio and the SOMA net income projection exercise are presented below. Sources for these assumptions include the March 2022 Surveys of Primary Dealers and Market Participants.

#### INTEREST RATE ASSUMPTIONS:

- ◆ The following interest rates are set based on combined responses to the March 2022 Surveys of Primary Dealers and Market Participants:
  - the effective federal funds rate,
  - the ten-year Treasury yield, and
  - the thirty-year fixed primary mortgage rate.
- ◆ The IORB rate is set 10 basis points below the top of the target range.
- ◆ The ON RRP offering rate is set 5 basis points above the bottom of the target range.
- ◆ In alternate interest rate scenarios, the interest rates are bounded below by 0 percent.

#### BALANCE SHEET ASSUMPTIONS:

- ◆ Projections start with the Federal Reserve balance sheet as of February 28, 2022.
- ◆ Asset-related assumptions:
  - Combined responses to the March 2022 Surveys of Primary Dealers and Market Participants for the timing of an end to reinvestments

- The terminal size and phase in period of caps is drawn from the Minutes from the March FOMC Meeting. The terminal caps for Treasuries and agency securities are set at \$60 billion and \$35 billion per month respectively and are phased in over a three-month period. Treasury bills are redeemed only when Treasury coupon maturities fall below the monthly cap.
- When the pace of portfolio decline decreases, all reinvestments are allocated to Treasury securities.
- Once reserve balances reach their assumed long-run level (see below), reserve management purchases are conducted in Treasury securities to keep up with the growth in liabilities and capital, while principal payments on MBS are reinvested into Treasury securities.

#### ◆ Liability-related assumptions:

- Longer-run levels of non-reserve liabilities and capital (excluding the TGA and ON RRP) are based on their average February 2022 level and grow over the projection horizon in line with nominal GDP, where the nominal GDP growth is based on combined responses to the March 2021 Surveys of Primary Dealers and Market Participants.
- The long-run level of reserves is set such that the ratio of reserves to GDP equals 8 percent.
- The TGA rises to \$700 billion by end Q2 2022 and grows with nominal GDP starting in Q3 2022 to \$965 billion by end 2030.
- Take-up in the ON RRP is assumed to gradually decline to 0 by 2025.
- Currency grows to \$3.1 trillion by end 2030.
- FIMA Reverse Repo Pool grows to \$373 billion by end 2030.
- DFMU balances grow to \$322 billion by end 2030.

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## APPENDIX 5:

### Reference Web Pages

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Policies, communications, and data discussed in this document can be found online at the websites for the Board of Governors of the Federal Reserve System and the Federal Reserve Bank of New York. Below, we provide the primary web pages where this source material can be found.

#### FEDERAL RESERVE BOARD

*FOMC rules and authorizations*

[https://www.federalreserve.gov/monetarypolicy/rules\\_authorizations.htm](https://www.federalreserve.gov/monetarypolicy/rules_authorizations.htm)

*FOMC statements, implementation notes, minutes, and information about policy normalization*

<http://www.federalreserve.gov/monetarypolicy/fomccalendars.htm>

<https://www.federalreserve.gov/monetarypolicy/policy-normalization.htm>

*Background on reserve requirements, interest on reserves, and IORB*

<https://www.federalreserve.gov/monetarypolicy/reservereq.htm>

<http://www.federalreserve.gov/monetarypolicy/reqresbalances.htm>

*Detailed transaction information about discount window lending to depository institutions and historical open market operations*

<https://www.federalreserve.gov/regreform/discount-window.htm>

[https://www.newyorkfed.org/markets/omo\\_transaction\\_data](https://www.newyorkfed.org/markets/omo_transaction_data)

*Federal Reserve System financial reports*

[https://www.federalreserve.gov/monetarypolicy/bst\\_fedfinancials.htm](https://www.federalreserve.gov/monetarypolicy/bst_fedfinancials.htm)

*Operational results, announcements, and other details regarding the Term Deposit Facility*

<https://www.federalreserve.gov/monetarypolicy/tdf.htm>

*Federal Reserve System COVID-19 Resources*

<https://www.federalreserve.gov/covid-19.htm>

#### FEDERAL RESERVE BANK OF NEW YORK

*Markets & Policy Implementation*

<https://www.newyorkfed.org/markets/index.html>

*Electronic version of this report and the underlying data for the charts and tables*

[https://www.newyorkfed.org/markets/annual\\_reports.html](https://www.newyorkfed.org/markets/annual_reports.html)

#### OPERATIONAL POLICIES, FAQs, OPERATION RESULTS, AND OTHER DETAIL REGARDING:

*Domestic market operations*

<https://www.newyorkfed.org/markets/domestic-market-operations>

*Repurchase and reverse repurchase agreements*

[https://www.newyorkfed.org/markets/rrp\\_op\\_policies.html](https://www.newyorkfed.org/markets/rrp_op_policies.html)

<https://apps.newyorkfed.org/markets/autorates/temp>

*Treasury open market and securities lending operations*

<https://www.newyorkfed.org/markets/domestic-market-operations/monetary-policy-implementation/treasury-securities>

<http://nyapps.newyorkfed.org/markets/pomo/operations/index.html>

<https://www.newyorkfed.org/markets/domestic-market-operations/monetary-policy-implementation/securities-lending>

*Agency MBS open market operations*

<https://www.newyorkfed.org/markets/domestic-market-operations/monetary-policy-implementation/agency-mortgage-backed-securities>

<https://www.newyorkfed.org/markets/ambms/operations/results>

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#### OPEN MARKET OPERATIONS DURING 2021

*Agency CMBS open market operations*

<https://www.newyorkfed.org/markets/domestic-market-operations/monetary-policy-implementation/agency-commercial-mortgage-backed-securities>

<https://www.newyorkfed.org/markets/domestic-market-operations/monetary-policy-implementation/agency-commercial-mortgage-backed-securities/agency-commercial-mortgage-backed-securities-operations>

*International market operations*

<https://www.newyorkfed.org/markets/international-market-operations>

*Foreign currency operations, including foreign reserves management, central bank liquidity swaps, and foreign exchange quarterly reports*

<https://www.newyorkfed.org/markets/international-market-operations/foreign-reserves-management>

<https://www.newyorkfed.org/markets/international-market-operations/central-bank-swap-arrangements>

[https://www.newyorkfed.org/markets/quar\\_reports.html](https://www.newyorkfed.org/markets/quar_reports.html)

*New York Fed counterparties for market operations*

<https://www.newyorkfed.org/markets/counterparties>

*System Open Market Account holdings*

<https://www.newyorkfed.org/markets/soma-holdings>

*Consolidated list of statements and operating policies across all Desk open market operations*

[https://www.newyorkfed.org/markets/op\\_policies.html](https://www.newyorkfed.org/markets/op_policies.html)

*Desk statement regarding small-value exercises*

<https://www.newyorkfed.org/markets/operational-readiness>

*Desk surveys of primary dealers and market participants*

[https://www.newyorkfed.org/markets/primarydealer\\_survey\\_questions](https://www.newyorkfed.org/markets/primarydealer_survey_questions)

[https://www.newyorkfed.org/markets/survey\\_market\\_participants](https://www.newyorkfed.org/markets/survey_market_participants)

*FR 2420 Report of Selected Money Rates*

<https://www.newyorkfed.org/markets/reference-rates>

<https://apps.newyorkfed.org/markets/autorates/obfr>

<https://www.newyorkfed.org/markets/obfrinfo>

<https://www.newyorkfed.org/medialibrary/media/markets/EFFR-technical-note-070815.pdf>

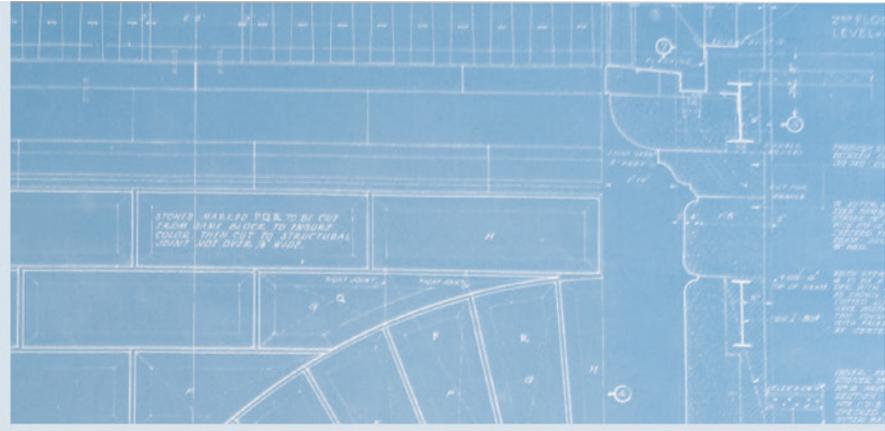
*Services for central banks and international institutions*

<https://www.newyorkfed.org/markets/central-bank-and-international-account-services>

*New York Fed actions related to COVID-19*

<https://www.newyorkfed.org/markets/new-york-fed-actions-related-to-covid-19>

THE FEDERAL RESERVE



## ENDNOTES

<sup>1</sup> On June 2, 2021, the Board announced its approval of a final rule amending Regulation D that covers reserve requirements of depository institutions. The rule, effective July 29, 2021, eliminates references in Regulation D to the interest on required reserves (IORR) and IOER rates and replaces them with a single interest on reserve balances (IORB) rate. View the press release at <https://www.federalreserve.gov/newsevents/pressreleases/bcreg20210602a.htm>. For additional information about Regulation D, see <https://www.federalregister.gov/documents/2021/06/04/2021-11758/regulation-d-reserve-requirements-of-depository-institutions>.

<sup>2</sup> See Federal Open Market Committee, “Statement on Longer-Run Goals and Monetary Policy Strategy,” as reaffirmed effective January 25, 2022, at [https://www.federalreserve.gov/monetarypolicy/files/fomc\\_longerrungoals.pdf](https://www.federalreserve.gov/monetarypolicy/files/fomc_longerrungoals.pdf). This statement is identical to the statement the FOMC reaffirmed on January 26, 2021, and adopted on August 27, 2020, after an extensive review.

<sup>3</sup> Pursuant to the Federal Reserve Act, the Board has authority over setting the interest rate paid on deposits and the FOMC has authority over rates for repurchase transactions.

<sup>4</sup> See Federal Reserve Board, “Senior Financial Officer Survey,” November 2021, at <https://www.federalreserve.gov/data/sfos/files/senior-financial-officer-survey-202111.pdf>, for views from banks on reserve management experiences, expectations for balance sheet management, and wholesale funding market activity, among other topics.

<sup>5</sup> For more on the standing FIMA repo facility, see [https://www.federalreserve.gov/monetarypolicy/files/FOMC\\_StandingFIMAREpoResolution.pdf](https://www.federalreserve.gov/monetarypolicy/files/FOMC_StandingFIMAREpoResolution.pdf).

<sup>6</sup> For technical details on swap arrangements, see <https://www.newyorkfed.org/markets/international-market-operations/central-bank-swap-arrangements>.

<sup>7</sup> Separately, the Desk also maintains reciprocal currency arrangements of \$2 billion with the Bank of Canada and \$3 billion with Banco de México. These arrangements were established in 1994 under the North American Framework Agreement to promote orderly currency exchange markets. See <https://www.newyorkfed.org/markets/international-market-operations/central-bank-swap-arrangements>.

<sup>8</sup> The Federal Reserve also established temporary swap lines with these nine central banks during the global financial crisis of 2008 via announcements on two separate dates: September 2008 (<https://www.federalreserve.gov/newsevents/pressreleases/monetary20080924a.htm>) and October 2008 (<https://www.federalreserve.gov/newsevents/pressreleases/monetary20081029b.htm>).

<sup>9</sup> The announcements detailing the discontinuation of the three-month U.S. dollar operations can be found at the following links: European Central Bank: [https://www.ecb.europa.eu/press/pr/date/2021/html/ecb.pr210423\\_1~d99570068c.en.html](https://www.ecb.europa.eu/press/pr/date/2021/html/ecb.pr210423_1~d99570068c.en.html) Bank of Japan: [https://www.boj.or.jp/en/announcements/release\\_2021/rel210423a.pdf](https://www.boj.or.jp/en/announcements/release_2021/rel210423a.pdf) Bank of England: <https://www.bankofengland.co.uk/markets/market-notices/2021/april/changes-to-the-provision-of-us-dollar-repo-operations-from-july-2021-market-notice-april> Swiss National Bank: [https://www.snb.ch/en/mmr/reference/pre\\_20210423/source/pre\\_20210423.en.pdf](https://www.snb.ch/en/mmr/reference/pre_20210423/source/pre_20210423.en.pdf).

<sup>10</sup> In a U.S. dollar liquidity swap, a foreign central bank (FCB) transfers a specified amount of its currency to the New York Fed in exchange for U.S. dollars at the prevailing market exchange rate. At the same time, the New York Fed and the FCB agree that the transfer will unwind on a specified future date at the same exchange rate as the initial transaction. At the conclusion of the second transaction, the FCB compensates the New York Fed at a market-based interest rate. The foreign currency liquidity swap lines also provide the Federal Reserve with the capacity to offer liquidity in foreign currencies to U.S. financial institutions should the FOMC judge that such actions are appropriate.

<sup>11</sup> Results of central bank liquidity swap operations can be found at <https://www.newyorkfed.org/markets/desk-operations/central-bank-liquidity-swap-operations>.

<sup>12</sup> Bids by SOMA at auctions of Treasury securities are placed as noncompetitive tenders and are treated as add-ons to announced auction sizes.

<sup>13</sup> The New York Fed is authorized by the FOMC to intervene in the foreign exchange market by executing foreign exchange transactions for the SOMA as directed by the FOMC and in its capacity as fiscal agent of the United States for the Treasury's Exchange Stabilization Fund.

<sup>14</sup> Further details can be found in the New York Fed's Treasury and Federal Reserve Foreign Exchange Operations quarterly reports. See [https://www.newyorkfed.org/markets/quar\\_reports.html](https://www.newyorkfed.org/markets/quar_reports.html).

<sup>15</sup> The Treasury used funds appropriated to the Exchange Stabilization Fund (ESF) through the Coronavirus Aid, Relief, and Economic Security (CARES) Act for certain of the equity contributions to facility SPVs.

<sup>16</sup> See information on the credit and liquidity facilities at <https://www.federalreserve.gov/funding-credit-liquidity-and-loan-facilities.htm>.

<sup>17</sup> Bond holdings as of December 31, 2020, were presented at amortized cost and ETFs at fair market value.

<sup>18</sup> In conjunction with the SMCCF, the Federal Reserve had also established the Primary Market Corporate Credit Facility (PMCCF), whose authorization to purchase eligible assets also expired on December 31, 2020.

<sup>19</sup> Of the \$75 billion equity commitment, \$25 billion was allocated to the SMCCF; \$50 billion was allocated to the Primary Market Corporate Credit Facility (PMCCF).

<sup>20</sup> The State of Illinois prepaid the entire balance of its remaining note in January 2022. The Metropolitan Transportation Authority prepaid the outstanding balance for one of its two remaining notes in March 2022, leaving just one \$2.9 billion note maturing in December 2023 outstanding.

<sup>21</sup> The outstanding balance of \$13.4 billion as of December 31, 2021, reflects the gross balance of \$15.4 billion less an allowance for loan losses of \$2.0 billion.

<sup>22</sup> In connection with the industry phaseout of LIBOR, lenders

may request loan modifications to use an alternative reference rate. The Boston Fed will approve one-month and three-month term SOFR at specified spreads and consider lender requests for use of other reference rates on a case-by-case basis. For specific detail, see item J.11. in the Boston Fed's Frequently Asked Questions at <https://www.bostonfed.org/-/media/Documents/special-lending-facilities/mslp/legal/frequently-asked-questions-faqs-post-termination.pdf?la=en>.

<sup>23</sup> Other assets includes the portion of the SPV equity from the U.S. Treasury invested in nonmarketable Treasury instruments. It does not reflect the portion of the equity that was held in cash deposits at Reserve Banks because such amounts are eliminated upon consolidation of the SPVs' accounting balances with those of Federal Reserve Banks.

<sup>24</sup> Since agency MBS purchases are conducted in the TBA market, a gap exists between the purchase date and the settlement date; there is a similar but shorter gap between purchase and settlement dates for agency CMBS. Figures for the domestic portfolio size include settled agency MBS and agency CMBS purchase amounts, unless otherwise stated. As of year-end 2021, net unsettled commitments to purchase agency MBS totaled \$99 billion, while for agency CMBS this value was \$0.

<sup>25</sup> Further information can be found at <https://www.treasurydirect.gov/govt/reports/pd/mspd/2021/opds122021.pdf>.

<sup>26</sup> The \$576 billion increase in agency MBS outstanding is on a settled basis. It includes \$195 billion in trades executed in 2020 that settled in 2021 and excludes \$99 billion in trades executed in 2021 that had not settled by year-end.

<sup>27</sup> As a result of the UMBS program, some securities held in the SOMA consisted of mortgages guaranteed by both Fannie Mae and Freddie Mac; however, for purposes here, such mortgages are counted as being guaranteed by their most recent guarantor.

<sup>28</sup> The weighted average life of an MBS refers to the expected time outstanding until the underlying mortgage principal is repaid. This calculation is dependent on a model of future prepayments and is therefore subject to some uncertainty and model sensitivity.

<sup>29</sup> "Modified duration" is used to calculate the duration of Treasury and agency debt securities, while "effective duration" is employed to measure the duration of MBS. Modified duration approximates the percentage change in the price of a fixed-income security given a 100 basis point parallel shift in the yield curve and is most applicable to securities with fixed cash flows, such as Treasury and agency debt securities. Effective duration,

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which accounts for the potential alterations in cash flows as interest rates change, is suitable for capturing the duration of MBS because it is affected by mortgage borrowers' decisions to exercise or forgo their prepayment option. Duration measures of the portfolio throughout this report are calculated on a par-weighted average basis.

<sup>30</sup> Due to the relatively small size of CMBS holdings, they are excluded from summary risk statistics.

<sup>31</sup> Homeowners' option to prepay their mortgage at any time without penalty adds uncertainty to the agency MBS holder's expected cash flows. In general, lower mortgage rates encourage homeowners to refinance their loans, thereby shortening the duration of the MBS securitizing these loans, while higher mortgage rates discourage homeowners from refinancing, thereby lengthening the duration of MBS.

<sup>32</sup> The ten-year equivalent is calculated using end-of-day prices for ten-year Treasury securities and current time to maturity, a change from past practice. Previous ten-year equivalent calculations assumed prices equal to par value and constant ten-year time to maturity, resulting in a reported \$3.56 trillion in ten-year equivalents at the end of 2020, as shown in the "Portfolio Risk Metrics" section of *Open Market Operations during 2020*.

<sup>33</sup> Macaulay duration is the weighted average time of future cash flows.

<sup>34</sup> Reserve balances are composed of balances held by eligible institutions for many reasons, including the need to meet intraday payments, to manage liquidity risk, and to help meet associated regulatory requirements.

<sup>35</sup> In this discussion, Federal Reserve notes outstanding are net of the holdings of Federal Reserve Banks. The Federal Reserve pays no interest on notes; however, Reserve Banks pay expenses incidental to the issuance and retirement of currency (such as costs related to manufacturing, shipping, educational services, and research and development). These expenses do not vary with the level of interest rates, unlike those associated with some other liabilities. Currency costs were \$1 billion in 2021.

<sup>36</sup> More than 99 percent of all U.S. currency in circulation is in the form of Federal Reserve notes; the remainder includes United States notes, national bank notes, and silver certificates, all of which remain legal tender.

<sup>37</sup> For a detailed discussion of factors affecting the amount of currency outstanding, see Thomas Haasl, Sam Schulhofer-Wohl,

and Anna Paulson, "Understanding the Demand for Currency at Home and Abroad," *Chicago Fed Letter* 396, 2018, <https://www.chicagofed.org/publications/chicago-fed-letter/2018/396>.

<sup>38</sup> Upon initiation of the transaction, each participant has an undivided interest, proportional to its investment, in a pool of securities from the SOMA that has been allocated to the FIMA reverse repo pool.

<sup>39</sup> For a detailed discussion of the evolution of Treasury cash management, see Paul J. Santoro, "The Evolution of Treasury Cash Management during the Financial Crisis," Federal Reserve Bank of New York *Current Issues in Economics and Finance* 18, no. 3, 2012, [https://www.newyorkfed.org/medialibrary/media/research/current\\_issues/ci18-3.pdf](https://www.newyorkfed.org/medialibrary/media/research/current_issues/ci18-3.pdf).

<sup>40</sup> For details, see U.S. Department of the Treasury, "Quarterly Refunding Statement of Acting Assistant Secretary for Financial Markets Seth B. Carpenter," May 6, 2015, at <https://home.treasury.gov/news/press-releases/jl10045>, and U.S. Department of the Treasury, "Quarterly Refunding Statement of Deputy Assistant Secretary for Federal Finance Brian Smith," February 2, 2022, at <https://home.treasury.gov/news/press-releases/jy0581>.

<sup>41</sup> A financial market utility may be designated as systematically important by the Financial Stability Oversight Council under Title VIII of the Dodd-Frank Wall Street Reform and Consumer Protection Act of 2010 (Dodd-Frank Act). Title VIII of the Dodd-Frank Act also allows these designated financial market utilities to establish and maintain Reserve Bank accounts.

<sup>42</sup> The assumptions for this report are drawn from results of the March 2022 Surveys of Primary Dealers and Market Participants.

<sup>43</sup> This assumes that GDP and PCE inflation evolve similarly, and that both PCE inflation and the growth rate of the GDP deflator imply an equivalent rate of growth of nominal GDP.

<sup>44</sup> All net income figures presented here assume that securities are held to maturity and that asset sales are not conducted. Any losses (gains) from sales would result in lower (higher) net income.

<sup>45</sup> Interest rate increases and decreases are modeled as parallel shocks, with rates floored at zero for negative shocks. If upward rate shocks were instead modeled such that rates increased more at the short end, net income would decline further than shown here. This is because interest costs associated with IORB are one of the prominent drivers of net income over the redemption period.

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<sup>46</sup> Data associated with the 200 basis point shocks are included in the data file that accompanies this report.

<sup>47</sup> For further information, see Sections 11.96 and 60.55 of the Financial Accounting Manual for Federal Reserve Banks. <https://www.federalreserve.gov/aboutthefed/files/bstfinaccountingmanual.pdf>.

<sup>48</sup> For further discussion of the impact of unrealized losses, see “SOMA’s Unrealized Loss: What Does It Mean,” a *FEDS Note* prepared by Brian Bonis, Lauren Fiesthumel, and Jamie Noonan, at <https://www.federalreserve.gov/econres/notes/feds-notes/somas-unrealized-loss-what-does-it-mean-20180813.htm>.

<sup>49</sup> The market value of securities converges to par value at maturity, thus resulting in the gradual reduction of unrealized losses.

<sup>50</sup> Interest rate increases and decreases are modeled as parallel shocks, with rates floored at zero for negative shocks. A non-parallel shock where shocks to longer-term rates are smaller than shocks to shorter-term rates would have a smaller effect on the unrealized gains and losses on the portfolio. This is because the gains and losses on the portfolio are largely driven by gains and losses on longer-dated holdings whose market value is more sensitive to changes in interest rates.

<sup>51</sup> For details about the New York Fed policy on counterparties for market operations and links to additional information on counterparties, see <https://www.newyorkfed.org/markets/counterparties/policy-on-counterparties-for-market-operations>.

<sup>52</sup> The U.S. Treasury promulgates rules and provides guidelines for Treasury auctions that are applicable to primary dealers and other bidders. Primary dealers are expected to bid their pro rata share of each auction, an amount that is determined as the total amount auctioned, divided by the number of primary dealers at the time of the auction.

<sup>53</sup> See <https://www.newyorkfed.org/markets/domestic-market-operations/monetary-policy-implementation/agency-commercial-mortgage-backed-securities/agency-commercial-mortgage-backed-securities-counterparties>.

<sup>54</sup> For additional information on CPFF and SMCCF counterparties, see <https://www.newyorkfed.org/markets/commercial-paper-funding-facility/commercial-paper-funding-facility-dealers> and <https://www.newyorkfed.org/markets/secondary-market-corporate-credit-facility/secondary-market-corporate-credit-facility-eligible-sellers>.

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