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# United States: Y2K Standby Financing Facility<sup>1,2</sup>

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Yale Program on Financial Stability Case Study

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## **Abstract**

As the United States prepared for the century date change (Y2K) on January 1, 2000, uncertainty about computer functioning generated uncertainty in capital markets. The Federal Reserve (Fed) grew particularly concerned that computer malfunctioning would cause disruptions in the short-term federal funds and repurchase agreement (repo) markets. Many market participants indicated early in 1999 that they would restrict their normal trading activities in the weeks leading up to Y2K, which contributed to the Fed's concern that liquidity might dry up. To ease pressures, the Fed created two special facilities through the Open Market Trading Desk of the Federal Reserve Bank of New York (FRBNY). The Standby Financing Facility (SFF) auctioned three sets of options for overnight repos for dates around the year's end to primary dealers. The Fed created the SFF to enable primary dealers to continue market-making and normal intermediation activities in securities markets in order to sustain the liquidity of these markets around the century date change. All told, the SFF auctioned \$481 billion of options, though none were exercised. The Fed also created the Special Liquidity Facility (SLF) to provide term-collateralized funding to depository institutions around the year's end, which we describe in a separate YPFS case (see Leonard 2022).

**Keywords:** broad-based emergency liquidity, century date change, Y2K, open-market operations, repurchase agreements, repo, options, discount window

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<sup>1</sup> This case study is part of the Yale Program on Financial Stability (YPFS) selection of New Bagehot Project modules considering broad-based emergency lending programs. Cases are available from the *Journal of Financial Crises* at <https://elischolar.library.yale.edu/journal-of-financial-crises/>.

<sup>2</sup> The author would like to thank Peter Fisher and Deborah Perelmuter, who worked at the Federal Reserve Bank of New York when the SFF was operational and provided helpful comments on an early draft of this case study. Their views do not necessarily reflect those of the Federal Reserve Bank of New York or the Board of Governors.

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## Overview

As the United States prepared for the century date change (Y2K) on January 1, 2000, uncertainty about computer functioning generated uncertainty in capital markets. The Federal Reserve (Fed) grew particularly concerned that computer malfunctioning would cause disruptions in the short-term federal funds and repurchase agreement (repo) markets (Drossos and Hilton 2000, 1). In early 1999, many market participants indicated that they would restrict their normal trading activities and curtail credit in the weeks leading up to Y2K, which contributed to the Fed's anticipation that liquidity might dry up (Drossos and Hilton 2000, 1).

In anticipation of Y2K, the Fed examined "approximately 90 million lines of our own code contained in thousands of programs and had to remediate approximately 10 percent of them" (Kelley 2000). Banks prepared similarly. Ultimately, the effects of Y2K on computing systems were negligible (Kelley 2000). However, starting in October, currency in circulation increased substantially as banks prepared for a possible surge in demand (see Figure 1).

Providing liquidity around the century's end was complicated by a concurrent shift in monetary policy. Between September and November 1998, the Fed cut rates three times, including one inter-meeting cut, to anticipate spillover credit tightening from the Russian Ruble crisis and the Asian Financial Crisis (CNN Money 1998a; CNN Money 1998a). However, by spring 1999 the Fed grew concerned about overheating and initiated a tightening cycle, hiking rates in June and August 1999 (CNN Money 1999a; CNN Money 1999b).

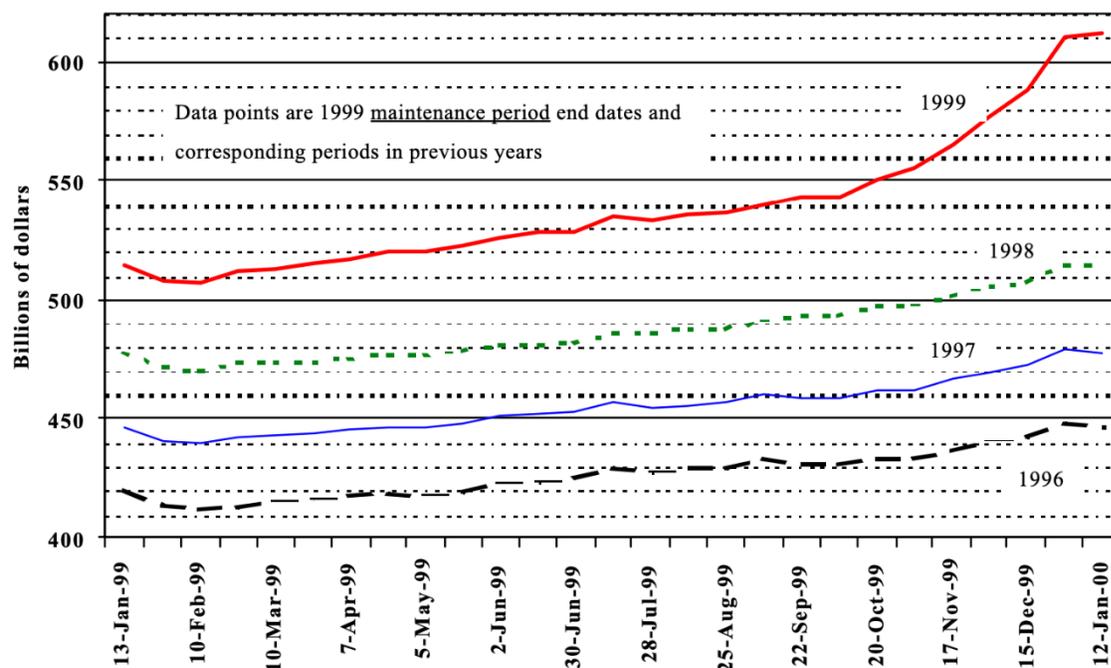
## Key Terms

Purpose: To "provide tangible encouragement to primary dealers to continue to make markets and to undertake their normal intermediation activities in securities markets, so as to sustain the liquidity of these markets around the century date change" (FRBNY 2000, 29)

Launch Dates	August 24, 1999 (Announcement)  October 20, 1999 (Operational)
Expiration Dates	December 1, 2000
Legal Authority	Section 14 of the Federal Reserve Act
Peak Outstanding	\$481 billion in option purchased, none exercised
Participants	Primary dealers
Rate	Dutch-style auction, strike price 150bps over Federal Funds Rate (FFR)
Collateral	Discount-window collateral
Loan Duration	Overnight, on exercise date
Notable Features	Unique auction/option design
Outcomes	No options exercised; market calmed

To ease market liquidity, the Fed created two special facilities through the Open Market Trading Desk of the Federal Reserve Bank of New York (FRBNY): the Special Liquidity Facility and the Standby Financing Facility (Drossos and Hilton 2000, 1).<sup>4</sup>

**Figure 1: Currency in Circulation**



Source: FRBNY 2000, 6.

The Fed created the SFF to “provide tangible encouragement to primary dealers to continue to make markets and to undertake their normal intermediation activities in securities markets, so as to sustain the liquidity of these markets around the century date change” (FRBNY 2000, 29). To do so, the SFF auctioned options on overnight repo transactions for exercise on specific days in the three weeks around the century date change (FRBNY 1999b). The SFF auctioned off overnight repo options in \$50 million increments through a Dutch-style auction (FRBNY 1999a). Options were sold in three “strips” of five consecutive days each; holders of an option could exercise the option on any date in the strip (FRBNY 1999a). The strike price—the rate charged if the option was executed—was set at 150 basis points (bps) or 250 basis points above the Federal Open Market Committee (FOMC)’s target federal funds rate (FRBNY 1999a). Eligible collateral for the SFF included all collateral typically eligible for repo with the FRBNY. The FOMC also temporarily expanded collateral eligible for

<sup>4</sup> The Fed created the Special Liquidity Facility (SLF) to provide collateralized term loans to depository institutions and “ensure that [they had] adequate liquidity to meet any unusual demands in the period around the period date change.” Notably, though, the Fed designed the facility to have a spread high enough to discourage its use, while still providing a backstop (Board of Governors 1999a; Board of Governors 1999d). (See Leonard 2022.)

repo to include certain securities issued by the government and the mortgage government-sponsored enterprises (GSEs) on August 24, 1999 (FRBNY 1999b).

The FRBNY held the first auction for the SFF on October 20, 1999. Demand exceeded the FRBNY's expectations, prompting the FRBNY to add two additional auctions on November 23 and December 1, and to increase the volume of options sold at the last few auctions (Drossos and Hilton 2000, 5).

Over seven auctions, the FRBNY sold \$114 billion worth of options on the strip covering December 23 to December 29, \$223 billion on the strip for December 30 through January 5, and \$144 billion on the strip for January 6 through January 12 (FRBNY 2000, 30). The Fed collected \$6 million in premiums from the options (Drossos and Hilton 2000, 5). (See Figure 2.)

**Figure 2: Summary of Auction Results for Options (Oct. 20, 1999–Dec. 1, 1999)**

	Auction Dates : Oct. 20	Oct. 27	Nov. 3	Nov. 10	Nov. 17	Nov. 23	Dec. 1
<b>December 23 – December 29 Strip</b>							
Total Propositions (bil. \$)	\$48	\$56	\$77	\$44	\$49	\$27	\$20
Accepted Propostions (bil. \$)	\$12	\$12	\$20	\$30	\$15	\$10	\$15
Stop-out rate (basis points)	1.5	2.5	11.0	1.0	1.0	1.5	0.5
<b>December 30 – January 5 Strip</b>							
Total Propositions (bil. \$)	\$116	\$147	\$136	\$86	\$83	\$51	\$53
Accepted Propostions (bil. \$)	\$18	\$25	\$50	\$50	\$30	\$25	\$25
Stop-out rate (basis points)	10.0	15.0	16.0	8.0	8.0	4.0	2.0
<b>January 6 – January 12 Strip</b>							
Total Propositions (bil. \$)	\$67	\$86	\$108	\$66	\$64	\$36	\$44
Accepted Propostions (bil. \$)	\$12	\$12	\$25	\$40	\$20	\$20	\$15
Stop-out rate (basis points)	3.0	5.0	11.5	2.5	2.5	2.5	4.0

Note: The quantities refer to the value of options contracts available for each day in the week covered by the strip. Dealers' propositions were submitted in basis point terms. Each basis point translated into a cost of about \$28 per day for every \$100 million worth of overnight RP option contracts. All accepted propositions were awarded at the stop-out rate.

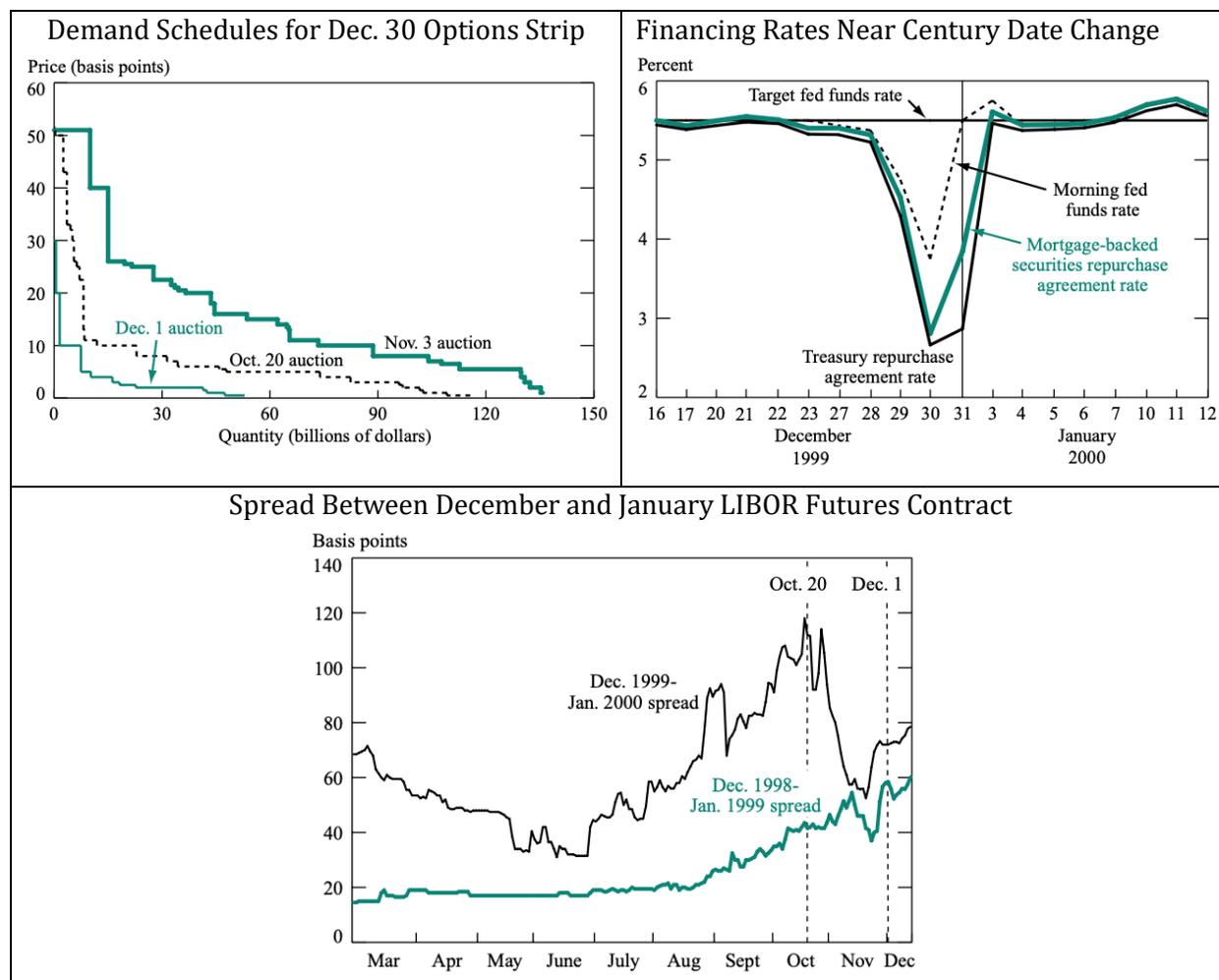
Source: FRBNY 2000, 31.

Note: total propositions are total bids for auction; accepted propositions are total bids accepted; the stop-out rate is the lowest rate on an accepted bid.

Demand for options was highest for the December 30 strip, as the Fed expected. Over the course of the auctions, the demand curve for options flattened, though all auctions attracted "a certain number of seemingly aggressive bids" (Drossos and Hilton 2000, 5). The spread between December and January LIBOR futures contrasts decreased substantially after the October 27 auction, indicating that the SFF may have calmed markets two months before the year's end (Drossos and Hilton 2000, 3). Ultimately, financing rates at the end of the year

were not elevated and none of the primary dealers exercised their SFF options (Drossos and Hilton 2000, 5).

**Figure 3: Key Rates Around the Century Date Change**



Source: Drossos and Hilton 2000.

### Summary Evaluation

Sundaresan and Wang (2006, 1) find that the SFF “contributed to the drop in the liquidity premium of Treasury securities” around Y2K. Drossos and Hilton (2000) note that “in conversations with the Desk, many dealers indicated that the options program helped ease their anxieties about prospective market conditions around the year-end” (Drossos and Hilton 2000, 6).

In the August 24, 1999, FOMC meeting, committee members anticipated that “the greatest impact [the SFF] could have is the announcement effect . . . it would be a measure of success of the program if very few of these options were exercised” (FOMC 1999, 20). In fact, none

of the options were exercised, indicating that the program primarily functioned by easing anxieties around the century date change.

During the Global Financial Crisis (GFC), the Fed implemented a facility with similar design to the SFF—the Term Securities Lending Facility Options Program (TOP) (FRBNY n.d.). The TOP offered overnight options to primary dealers to ensure “liquidity over periods of heightened collateral market pressures.” The TOP held one auction on June 3, 2009, for exercise on June 24, 2009, to ease quarter-end pressures. The Fed sold \$12 billion in options and none of the options were exercised (FRBNY n.d.).

Administrators of the SFF indicated that by selling options the Desk could provide liquidity during the century date change without permanently impacting the federal funds rate (FFR). This was especially useful in the context of a tightening cycle in monetary policy.

<b>Context: United States 1999–2000</b>	
<b>GDP (SAAR, nominal GDP in LCU converted to USD)</b>	\$9.900 trillion in 1999 \$10.436 trillion in 2000
<b>GDP per capita (SAAR, nominal GDP in LCU converted to USD)</b>	\$34,514 in 1999 \$36,335 in 2000
<b>Sovereign credit rating (five-year senior debt)</b>	Data for 1999: Moody's: Aaa S&P: AAA Fitch: AAA  Data for 2000: Moody's: Aaa S&P: AAA Fitch: AAA
<b>Size of banking system</b>	\$5.378 trillion in 1999 \$5.775 trillion in 2000
<b>Size of banking system as a percentage of GDP</b>	54.33% in 1999 55.34% in 2000
<b>Size of banking system as a percentage of financial system</b>	27.48% in 1999 29.63% in 2000
<b>Five-bank concentration of banking system</b>	Data not available Data not available
<b>Foreign involvement in banking system</b>	Data not available Data not available
<b>Government ownership of banking system</b>	0% in 1999 0% in 2000
<b>Existence of deposit insurance</b>	Yes, up to \$100,000 in 1999
<i>Sources: Bloomberg World Bank Global Financial Development Database, World Bank Deposit Insurance Dataset.</i>	

## Key Design Decisions

### **1. Purpose: The Board of Governors of the Federal Reserve created the Standby Financing Facility (SFF) to provide liquidity to primary dealers to ensure market functioning around the century date change.**

The FOMC authorized the SFF on August 24, 1999. The FOMC assigned the administration of the program to the FRBNY, which manages the discount window (FRBNY 1999b).

The purpose of the SFF was to “provide tangible encouragement to primary dealers to continue to make markets and to undertake their normal intermediation activities in securities markets, so as to sustain the liquidity of these markets around the century date change” (FRBNY 2000). Sources at FRBNY indicated that a key purpose of the FRBNY was to provide funding to financial institutions that were ineligible for discount-window loans, through the primary dealers.

At the August 24, 1999, FOMC meeting, committee members highlighted concerns that primary dealers would not be “willing to be on both sides of the market for us in some depth . . . market conditions may frustrate the Desk’s ability to add and drain reserves in the period around the year-end and to keep the funds rate trading around the Committee’s target” (FOMC 1999, 19).

### **2. Legal Authority: The SFF derived legal authority from Section 14 of the Federal Reserve Act.**

Section 14 of the Federal Reserve Act gives the Federal Reserve its legal authority to conduct domestic open market operations programs. The FOMC annually authorizes the New York Fed to execute open market transactions on the Fed’s behalf. Its directions to the New York Fed are contained in the Authorization for Domestic Open Market Operations. On August 24, 1999, the FOMC voted unanimously on a temporary addition to that document that authorized the SFF. Specifically, the FOMC added language to allow the FRBNY to sell options on repos for exercise no later than January 2000 (Board of Governors 1999b, 820). Unlike the SLF, the Federal Reserve Board did not have to revise its regulations to create the SFF (see Leonard, 2022).

### **3. Part of a Package: The SFF was announced along with other measures to enhance liquidity availability around the CDC.**

The SFF was part of the Fed’s broad, multi-year preparations for the century date change (Kelley 2000). On August 24, 1999, the FOMC agreed on a number of measures: expanded accepted collateral at the discount window, authorization to execute repurchase agreements with up to 90-day maturities, and the SFF (FRBNY 1999b). In a press release on September 8, 1999, the FRBNY announced these measures. It said their purpose was to facilitate “the smooth functioning of money and financing markets and . . . to manage banking system reserves” with respect to Y2K (FRBNY 1999b). Previously, on July 20, the Federal Reserve

Board announced the Special Liquidity Facility to provide collateralized term loans to depository institutions (Board of Governors 1999a).

**4. Management: The FOMC authorized the SFF and managed oversight of the facility.**

The FOMC directed the Trading Desk at the Federal Reserve Bank of New York (FRBNY) to administer the SFF (FRBNY 2000, 1). Disclosure and oversight for the SFF were consistent with procedures in place for the discount window and open market operations (FRBNY 2000, 4).

**5. Administration: The SFF was administered through a Dutch-style auction.**

The SFF was administered through a Dutch-style auction, wherein options were auctioned in \$50 million increments, and winners of each auction paid the rate on the lowest accepted bid (FRBNY 1999a). Auctions for the three strips were initially to be held at 2:30 p.m. on five Wednesdays, beginning October 20, 1999, and ending November 17, 1999 (FRBNY 1999a). The FRBNY added two additional auction dates on November 23 and December 1 in response to higher than expected uptake for the first five auctions (Drossos and Hilton 2000, 5).

**6. Eligible Participants: Only primary dealers were eligible for the SFF.**

Only primary dealers were eligible for the SFF (FRBNY 1999a). While the SLF provided liquidity to depository institutions, the Fed worried that a spike in rates around Y2K could place strain on primary dealers' positions and therefore limit their ability to make markets, causing liquidity to dry up. Drossos and Hilton (2000, 2) describe the potential as follows:

If cash investors at year-end refrained from lending to securities dealers except at exorbitant rates, then the dealers—including primary dealer counterparties in the Desk's monetary operations—would be compelled to pay these rates to finance their holdings of securities. Those dealers that could not pay extremely high rates could be forced to default.

**7. Funding Source: The SFF was funded through an expansion of the Fed's balance sheet.**

The SFF was funded through the Fed's balance sheet (FRB 2020).

**8. Program Size: The SFF was initially authorized to auction up to \$32 billion in options at its first auction, and to set future offerings in response to demand.**

The SFF was initially authorized to auction up to \$32 billion in options at the first auction. The term sheet indicated that for subsequent auctions, the FRBNY would offer similar or larger amounts depending on demand at the first auction (FRBNY 1999a). At the August 24 FOMC meeting, the FOMC anticipated auctioning \$200 billion in options in total (FOMC 1999, 31).

In practice, the SFF auctioned options worth \$42 billion at the first auction, \$49 billion at the second, \$95 billion at the third, \$120 billion at the fourth, \$65 billion at the fifth, \$55 billion at the sixth, and \$55 billion at the seventh (FRBNY 2000, 31). The increase in the size of the auctions was consistent with the SFF's term sheet, which said that the FRBNY could increase or decrease the volume of options at auction (FRBNY 1999a). Officials at FRBNY indicated that they preannounced the total auction size, as well as the auction size per strip.

**9. Individual Participation Limits: The SFF imposed limits on the number of bids any primary dealer could post per strip.**

The SFF limited the number of bids an eligible participant could place per strip. Specifically, a primary dealer could place at most two bids for its own account and no more than two bids for each customer per strip (FRBNY 1999a).

**10. Rate Charged: The SFF sold options through a Dutch-style auction, which, if executed, were priced 150bps above the federal funds rate.**

The SFF auctioned off overnight repo options in \$50 million increments through a Dutch-style auction (FRBNY 1999a). In Dutch auctions, the winners of the auction pay the bid of the lowest successful bidder, determined by accepting bids—starting with the highest rates bid—until the amount of accepted liquidity exhausts the amount offered. Options were sold in three sets, called “strips,” each of five days as shown in Figure 4.

**Figure 4: SFF Option Strip Dates**

<b>Strip Date</b>	<b>Dates Options Were Exercisable</b>
Dec. 23 Strip	December 23, 24, 27, 28, and 29
Dec. 30 Strip	December 30, 31, January 3, 4 and 5
Jan. 6 Strip	January 6, 7, 10, 11, 12

*Source: FRBNY 1999a.*

Options bought in a given strip could be exercised on any or all of the days covered by the strip for up to the total amount that the holder was awarded at auctions for that strip. Holders of a strip could exercise all or part of the strip as a term repo, covering two, three, four, or five business days, but had to pre-announce exercise on subsequent days (FRBNY 1999a). For example, a holder of \$100 million in Dec. 30 strip options could have exercised \$50 million on December 30 and \$50 million on December 31 but had to pre-announce the exercise of options on December 31.

The strike price for options was set at 150 basis points above the FOMC's target federal funds rate as of 10:00 a.m. on the exercise date (FRBNY 1999a). Additionally, options in the December 30 strip could be exercised after 10:00 a.m. and before 11:30 a.m. with a strike price of 250 basis points above the FOMC's target federal funds rate as of 11:30 a.m. on the exercise date (FRBNY 1999a).

In discussing the proposal at the August 24, 1999, FOMC meeting, committee members highlighted that “a range of 150 basis points is considerably wider than the range in which

normal arbitrage takes place” and argued that the facility would offer primary dealers “market disaster insurance to get them more comfortable intermediating within that range” (FOMC 1999, 29). Sources at the FRBNY indicated that they chose an auction format to ensure that options were sold at a market-clearing price rather than as a stigma-limiting measure.

**11. Eligible Collateral: Eligible collateral for the SFF included all collateral typically eligible for repo with the FRBNY, as well as expanded collateral that the FOMC approved at its August 24, 1999, meeting.**

Eligible collateral for the SFF included all collateral typically eligible for repo with the FRBNY, as well as additional collateral that the FOMC approved at its August 24, 1999, meeting. Expanded collateral included pass-through mortgage securities of the Government National Mortgage Association (Ginnie Mae), Federal Home Loan Mortgage Corporation (Freddie Mac) and Federal National Mortgage Association (Fannie Mae); STRIP (Separate Trading of Registered Interest and Principal of Securities) securities of the US Treasury; and “stripped” securities of other government agencies (FRBNY 1999b). Stripped securities are coupon bonds that have been transformed into zero-coupon bonds.

The FRBNY established triparty settlement agreements with two clearing banks to value and accept delivery of collateral for repo. The FRBNY stated that “as a practical matter, triparty agreements were needed to facilitate the pricing and valuing of mortgage-based securities on” repos (FRBNY 2000, 4).

**12. Loan Duration: Options, if exercised, bore overnight maturities, though participants could also select to exercise the option as a term repo with a duration between two and five days.**

The SFF sold options on overnight repurchase agreements (repos), that therefore had overnight maturities. However, holders of an option could also exercise the option as a “term repo, covering two, three, four, or five business days, by pre-announcing the exercise of subsequent days” (FRBNY 1999a).

**13. Other Conditions: The FRBNY imposed minimum bids and price-bid increments.**

The minimum price a dealer could bid was set at 0.5 basis points (FRBNY 1999a). Minimum increments were set at 0.5 basis points as well (FRBNY 1999a).

**14. Impact on Monetary Policy Transmission: The FRBNY developed strategies for limiting the impact of the SFF on reserves, in the event that options were exercised.**

In creating the program, the FRBNY developed strategies for offsetting the impact of SFF options on the level of reserves. The Desk planned “to offset the impact of reserves created through the exercise of options...by cutting back on the supply of reserves provided through ordinary RPs...[or entering] the market to drain reserves later in the day” (FRBNY 2000, 30). If strong upward rate pressures triggered a broad exercise of SFF options, the Desk was

“prepared to abandon its normal reserve management...and to accept a super-abundance of reserves created by the options as useful for countering market stress” (FRBNY 2000, 30). Sources at the FRBNY indicated that by selling options the Desk could provide liquidity during the century date change without permanently impacting the federal funds rate (FFR).

**15. Other Options: The Fed also created the SLF to provide liquidity to depository institutions.**

The Fed also created the SLF, a facility that operated through the discount window to provide liquidity to depository institutions (see Leonard, 2022).

**16. Similar Programs in Other Countries: Some other countries also took special measures.**

Although some other countries also took special measures in anticipation of the century date change, Sundaresan and Wang (2006, 22) could not find an example of another central bank that sold options like the Fed’s SFF. Other programs undertaken by other central banks varied. The Bank of Canada issued Y2K options to depository institutions without a premium. The Bank of Canada also expanded the range of collateral accepted, like the Fed. The Bank of England issued special Treasury bills that matured on December 31, 1999; expanded the range of repo maturities to 90 days; and expanded the range of accepted collateral (Sundaresan and Wang 2006, 22).

**17. Communication: Preparations for the century date change began in late June 1995. Chairman Alan Greenspan discussed the facilities and the century date change generally on September 17, 1999.**

In late 1995, the Fed created the Century Date Change (CDC) project to coordinate Y2K readiness across the Federal Reserve system. As part of this plan, the CDC project reviewed every bank by mid-1998 to assess readiness (Kelley 1997). Between 1997 and 1999, the Fed published contingency planning guides, brochures on bank readiness, and press releases explaining the impact of the century date change (Board of Governors 1999c).

On September 17, 1999, the Fed held a Year 2000 Summit to discuss the century date change event, and the actions that the financial sector and the Fed had taken to prepare for the event. Chairman Greenspan noted that while the financial sector had generally taken the necessary steps to prepare and that “the technical breakdowns that might occur as a consequence of the CDC are readily containable,” there was evidence that borrowers and lenders were building up liquid assets to reduce reliance on credit markets. He said that the SLF and the SFF “should help to ensure an ample supply of liquidity and relieve funding pressures” (Greenspan 1999).

**18. Disclosure: The FRBNY published the volume of bids, the range of prices submitted, and the lowest accepted bid.**

In the original term sheet published October 7, 1999, the FRBNY indicated that the day following each auction it would publish the volume of bids submitted and accepted, the range of prices submitted, and the lowest accepted bid (stop-out rate). It also indicated that it would publish the volume of options exercised shortly after the deadline for notice (FRBNY 1999a).

On October 8, 1999, the FRBNY expanded the information it publicly disclosed to make the SFF “more transparent” (FRBNY 2000, 4). Specifically, the FRBNY additionally published the weighted average rate on accepted propositions (FRBNY 2000, 4).

**19. Stigma Strategy: In discussing the proposal for the facility, FOMC committee members did not comment on stigma strategy.**

At the August 24, 1999, meeting wherein selling Y2K options was first proposed, FOMC members did not explicitly discuss stigma associated with the facility. Rather, committee members discussed the price mechanism for the facility so that the price was “low enough so that we are making insurance available to the market to calm it down but high enough to provide some constraint on demand,” indicating that they anticipated primary dealer uptake (FOMC 1999, 32).

Sources at FRBNY indicated that the facility was designed as an auction to ensure that liquidity was offered at market rates, which would destigmatize borrowers. However, the program also charged a penalty rate and a fee to limit overuse.

**20. Exit Strategy: The SFF was announced with a pre-announced end date, as it held only a few auctions.**

The SFF held only a few auctions, and all options expired by January 12, 2000 (FRBNY 1999a).

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