DOMESTIC OPEN MARKET OPERATIONS DURING 1999

February 2000

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FEDERAL RESERVE BANK OF NEW YORK, MARKETS GROUP

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I. IMPLEMENTATION OF MONETARY POLICY IN 1999

A. Directives of the Federal Open Market Committee

In 1999, the directives issued by the Federal Open Market Committee (FOMC) instructed the Trading Desk at the Federal Reserve Bank of New York to foster conditions in reserve markets consistent with maintaining the federal funds rate at an average around a specified rate, which is commonly referred to as the federal funds rate target. The FOMC raised the federal funds target three times during the year, each time by 25 basis points at a scheduled meeting (Table 1). On the last two of these dates, the Board of Governors approved increases of equal size to the discount rate. The public announcement released after the conclusion of the May FOMC meeting was the first to indicate the bias the Committee adopted in its directive. But the bias that is outstanding at any point in time has no direct implications for the daily selection of open market operations.

B. Overview of Operating Procedures and Practices

The Desk used open market operations to align the supply of deposit balances held by depository institutions at the Federal Reserve with the level of demand believed consistent with maintaining the funds rate around its target level. Each morning, the Desk considered whether open market operations were needed based on estimates of the supply and demand for balances, and any operation designed to alter balances that same day was typically arranged shortly afterwards. Estimated needs for balance adjustments in upcoming days and weeks, an assessment of possible forecast errors, and current and anticipated trading conditions in the federal funds markets were all considered when selecting the type and size of operations.

The ability of depository institutions to average their holdings of balances at the Fed over two-week maintenance periods to meet their reserve and clearing balance requirements gives them some flexibility in managing their accounts from day to day. This ability to average is an important source of elasticity in banks' daily demands for balances, limiting the volatility in rates that can develop when the Desk misestimates either the supply of or demand for balances. Nonetheless, the funds rate will firm if the level of balances falls so low that some banks have difficulty finding sufficient funds to cover late-day deficits in their Fed accounts. On the other hand, the rate will soften if there are so many balances that some banks risk ending a period holding unusable excess reserve balances. The Desk weighs these possibilities every day when deciding what level of balances to leave in place. As depositories have found ways to avoid incurring reserve requirements, the degree of elasticity across days has diminished, and the Desk has had to pay increasing attention to daily fluctuations in the supply of and demand for balances.

Adapted from a report to the Federal Open Market Committee by Peter R. Fisher, Executive Vice President of the Federal Reserve Bank of New York and Manger of the System Open Market Account. Spence Hilton was primarily responsible for the preparation of this report, with the assistance of many other members of the Markets Group.

Table 1

Changes in the Federal Funds Rate Specified in the FOMC Directive

Date of Change	Expected Federal Funds Rate (Percent)	Associated Discount Rate (Percent)
11/17/98	4 ¾	4 ½
6/30/99	5	4 ½
8/24/99	5 ¼	4 ¾
11/16/99	5 ½	5

The effectiveness of the Desk's operating procedures for maintaining control over the federal funds rate rests on the existence of liquid short-term financing markets. Trading in the overnight federal funds market is a critical mechanism through which the supply of balances at the Fed is distributed among banks, while the Desk intervenes in the short-term market for repurchase agreements to make most of its adjustments to the supply of these balances. These two markets must be functioning efficiently for the current operating procedures to work effectively.

In advance of the year-end, there was concern about whether levels of trading and intermediation in the financing markets around the century date change (CDC) would be sufficient for the Desk's usual operating procedures to work effectively, because some market participants had expressed a reluctance to maintain normal levels of activity in financing markets at that time. The Desk also felt that the large projected reserve deficiencies around the year-end potentially could strain its ability to meet reserve demands with its existing practices. How the Desk prepared for and carried out open market operations in the months leading up to and in the days immediately surrounding the rollover date is a major focus of this report.

C. New Developments in 1999

Several modifications were made to the practices and procedures used in the conduct of monetary operations. Most of these changes were designed at least in part to maintain the Desk's ability to control effectively the funds rate around the century date change.

On April 5, the Desk moved up its normal market entry time for arranging temporary operations by about one hour. Since that date, these operations were usually arranged within an approximate 10 minute interval surrounding 9:30 a.m., with the exact entry time randomly chosen. The acceleration of the entry time was made after the compilation of data and preparation of forecasts for reserve factors were placed on an earlier schedule. The earlier entry time allows the Desk to arrange its operations at a time of day when financing markets are more active and liquid. The Desk has always been prepared to depart from its normal entry time when circumstances warranted.

An important innovation that altered the institutional framework within which open market operations were conducted was made on July 20, when the Federal Reserve Board voted to establish a Century Date Change Special Liquidity Facility (SLF) for lending to depository institutions from October 1, 1999 through April 7, 2000. The facility was designed to help ensure that depository institutions in sound financial condition would have adequate liquidity to meet any unusual demand in the period around the century date change. The interest rate charged on loans from the special facility was set at 150 basis points above the FOMC's target federal funds rate. Collateral requirements were identical to those on regular discount window loans, but there were no restrictions on the use and duration of SLF loans over the life of the facility, and borrowers were not required to seek funds elsewhere first. Subsequently, the Federal Reserve Banks expanded the range of collateral accepted for discount window purposes.

At its August 24 meeting, the FOMC adopted four proposals, listed below, whose purposes were to ensure the Desk's ability to counter potential liquidity strains in money and financing markets in the period surrounding the century date change and to position the Desk to meet reserve shortages that potentially could far exceed the large seasonal deficiencies that normally arise around each year-end. Each listed proposal required an amendment to the Desk's authorization for domestic open market operations, which is reprinted in Appendix A.

- The maximum maturity of repurchase agreements (RPs) and matched sale-purchase transactions (MSPs) was permanently extended to 90 days, from the previous 60 day limit.

- A temporary expansion of the securities eligible as collateral on the Desk's repurchase agreements was approved through April 2000. To implement this decision, the FOMC voted to suspend until April 30, 2000 several provisions of its "Guidelines for the Conduct of System Operations in Federal Agency Issues," which impose restrictions on transactions in federal agency transactions. The principal effect was the inclusion of pass-through mortgage securities of the Government National Mortgage Association, Freddie Mac, and Fannie Mae, and of stripped securities of the U.S. Treasury and other government agencies.

- The Desk was granted authority through April 30, 2000 to use reverse repurchase agreements in addition to matched sale-purchase transactions to absorb reserves on a temporary basis.

- The FOMC authorized the Desk to provide a temporary Standby Financing Facility (SFF) through the auction of options on repurchase agreements, reverse repurchase agreements, and matched sale-purchase transactions with the Desk for exercise no later than January 2000. Under this authority, the Desk sold options on overnight repurchase agreements for the period December 23, 1999 through January 12, 2000.

The Desk established triparty settlement arrangements with two clearing banks for valuing and accepting delivery of collateral on its repurchase agreements. The Desk has the discretion to use whatever settlement procedure best meets its purposes. But, as a practical matter, triparty agreements were needed to facilitate the pricing and valuing of mortgage-backed securities on RPs.

On October 8, the Desk expanded the information it publicly disclosed immediately following each temporary open market operation in order to make these operations more transparent. The Desk began to release data on the total volume of propositions submitted (in addition to total accepted propositions which was already released), the weighted average rate on accepted propositions, the high and low rates submitted, and the stop-out rate.

II. FACTORS AFFECTING THE SUPPLY OF AND REQUIRED DEMANDS FOR FEDERAL RESERVE BALANCES

The specific open market operations selected by the Desk are driven mostly by the behavior of factors that affect the supply of balances held by depository institutions at the Federal Reserve, and by the levels of these balances that depository institutions are required to hold each two-week maintenance period. The difference between the supply of balances and their demand is a prime determinant of the federal funds rate, and open market operations are used actively to maintain an appropriate supply of balances relative to demand. Large permanent changes in the supply of or demand for balances at the Fed typically have been addressed with outright transactions made in the market which permanently affected the size of the System Open Market Account portfolio. Shorter-term movements in the supply of or demand for balances are mostly addressed with temporary operations, with the expected duration and degree of uncertainty about these shorter-term movements being important determinants of the maturity mix of temporary operations.

A. The Behavior of Factors Affecting the Supply of Federal Reserve Balances

In 1999, the levels of several factors—currency, the Treasury balance at the Fed, and the foreign RP pool—were profoundly affected by temporary demands associated with the century date change. These CDC influences lifted the values of these factors at the year-end well above their corresponding levels of one year earlier, but these effects were temporary. Apart from currency, permanent movements in factors were relatively modest in absolute terms (Table 2).

Changes in currency in circulation during 1999

Over 1999, currency in circulation, which includes both currency in the hands of the public and banks' vault cash holdings, expanded by nearly $100 billion, measured by the change from the final maintenance period of 1998 to the final period in 1999, far surpassing any previous annual change (Chart 1). By comparing the level of currency at each point in time in 1999 to its level at the corresponding time in the

Table 2

Factors Affecting the Supply of and Demand for Balances at the Fed

(billions of dollars)

				Impact of Change on the Supply or Demand for Balances at the Fed 1998	1999
Factors affecting the Supply of Balances	Levels on the final day of the year: Dec. 31, 1997	Dec 31, 1998	Dec 31, 1999		
Currency in Circulation	482.4	517.5	628.1	-35.1	-110.6
Foreign Currency	16.6	17.5	14.4	0.9	-3.0
SDRs	9.2	9.2	6.2	0.0	-3.0
Foreign RP Pool	17.0	20.9	39.2	-3.9	-18.3
Float & FRSA	0.6	1.8	-0.2	1.1	-2.0
Treasury Balance	5.4	6.1	28.4	-0.6	-22.3
All Other Items	--	--	--	4.4	1.0
Net Changes in factors affecting supply	--	--	--	-33.3	-158.9
Factors affecting the Demand for Balances	Averages for the maintenance period ending: Dec. 31, 1997	Dec 30, 1998	Dec 29, 1999		
Required Reserves	47.4	44.0	40.9	3.4	-3.1
Required Clearing Balances	6.7	6.6	7.4	0.0	0.8
Applied Vault Cash	37.7	36.7	37.3	0.9	-0.6
memo: Total Required Balances	16.4	13.9	11.0	-2.5	-2.9

Note: Changes in factors affecting the supply of balances are expressed in terms of their impact on supply. Most as-of adjustments are treated as a supply factor in the "Other" category in this table, except float related as-ofs (FRSA). Changes in factors affecting the demand for balances are expressed in terms of their impact on demand.

preceding year, seasonal effects normally experienced around each year-end largely disappear, and the portion of currency growth in 1999 linked to the century date change versus other factors can be approximated (Chart 2).[1] Through the first nine months of the year, currency in circulation rose steadily at a pace slightly above that of one year earlier. The accelerated growth in currency during this time appears to have occurred too far ahead of the year-end to have been significantly influenced by CDC-related concerns. Instead, it seems to have reflected continued strong underlying growth in demand.

Beginning in October, CDC-related demands appear to have become pronounced, and currency in circulation began to rise more rapidly above the levels of one year earlier. Most of the acceleration in October and November was in currency held in bank vaults, and not in currency held by the public. Banks began a gradual buildup of their holdings in anticipation of a possible surge in the public's demand in the final weeks of the year. The run-up in currency in circulation continued right up to the eve of the year-end, then quickly began to reverse. Holdings of currency by the public did surge very late in the year, but not by

[1] The values in Chart 2 are averages over dates that correspond to two-week computation periods that end on the indicated date; contemporaneous values of vault cash and public holdings of currency are not available on a maintenance period basis.

Chart 1
CURRENCY IN CIRCULATION
levels; maintenance period averages

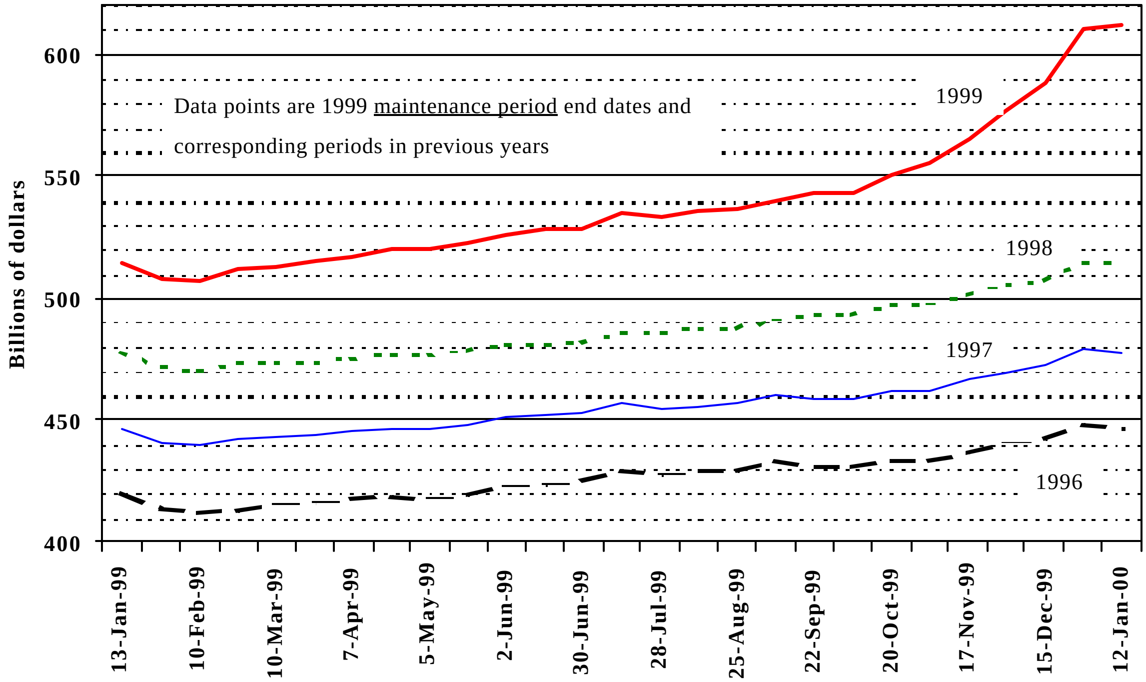
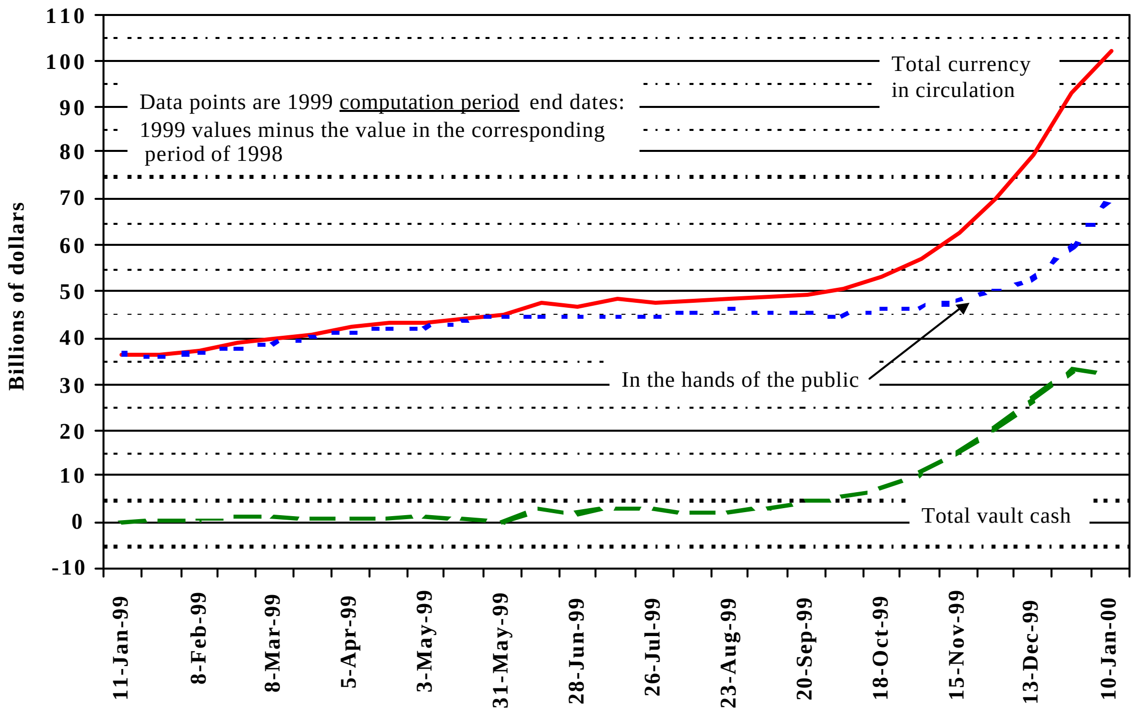


Chart 2
CURRENCY: TOTAL, HELD BY THE PUBLIC, AND VAULT CASH
differences from one year earlier; computation period averages



as much as originally thought possible. The increase in currency from September 30, 1999 through its seasonal peak on December 30, 1999 was $60 billion greater than the change from September 30, 1998 to the seasonal peak (on December 29, 1998) during the previous year. To facilitate forecasting of currency, starting in early December the Cash Departments at the Federal Reserve Banks, which closely monitor the daily inflows and outflows of currency, began to provide the Desk with advance estimates of these flows for use in preparing currency forecasts.

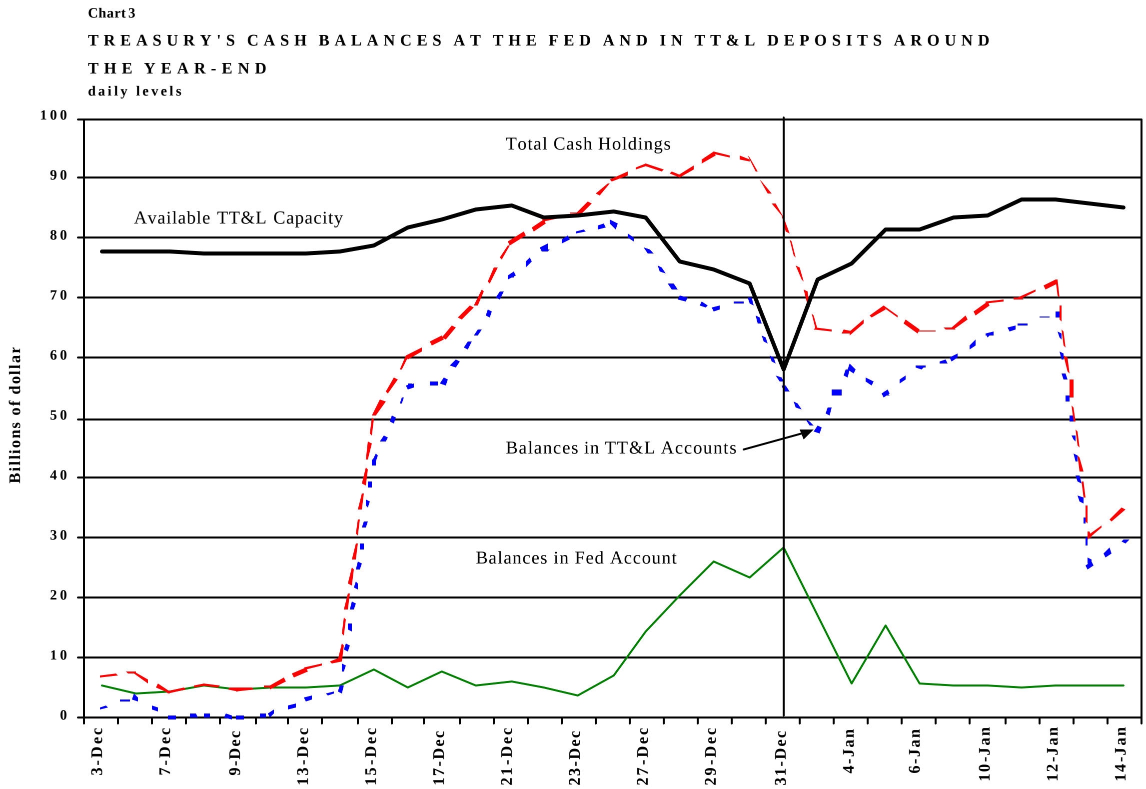
Temporary changes in the Treasury balance and the foreign RP pool around the century date change

While currency in circulation was on its final ascent in the days leading up to the year-end, the Treasury balance at the Fed and the internal foreign RP investment pool also rose sharply, then quickly receded in the days immediately after the year-end.

In August, the Treasury first announced its intention to target an above-normal level of total cash balance holdings on the year-end, for precautionary purposes to meet potential fiscal obligations. The initial year-end target balance was $80 billion (later pared to $70 billion), a level that is roughly twice the normal level of holdings on year-end dates. The Treasury built up its cash position over the final months of the year by issuing several cash management bills and increasing the sizes of its regularly issued bills, and it ended the year with total cash holdings of $83 billion.

Under normal circumstances, Treasury staff works with the Desk to target a cash balance of about $5 billion in its account at the Fed and of about $7 billion on and following important tax dates. Remaining cash is kept on deposit in special collateralized Treasury Tax & Loan (TT&L) accounts at commercial banks. However, many participants in the TT&L program routinely cut their maximum TT&L capacity by withdrawing eligible collateral ahead of important financial statement dates and on occasions when they anticipate receiving high levels of funding from other sources. In the week leading up to this year-end, cuts in available TT&L capacity amounted to nearly $25 billion (Chart 3). These capacity cuts, combined with high levels of the Treasury's total cash holdings, helped push up the size of the Treasury's Fed balance in the days leading up to the year-end, thereby draining reserves.

The Desk anticipated these developments, although there was always considerable uncertainty about the timing and magnitudes of the various cash flows that could affect the size of the Treasury's balance at the Fed on any given day. As a general rule, the size of the Treasury balance at the Fed is more predictable when at least a modest portion of TT&L capacity remains unused. Unused capacity is available to absorb some of the unanticipated portion of Treasury's net cash inflows which would otherwise spill over into the Fed account and thereby unexpectedly drain reserves. To maintain a greater degree of predictability in the daily levels of the Treasury's Fed account, in the week leading up to the year-end, the Desk worked closely with Treasury staff to target a level of balances in the Treasury's Fed account that would preserve a



protective cushion of unused TT&L capacity. Roughly $5 billion of TT&L capacity remained unused during these days. In the absence of this approach, the actual Treasury balance at the Fed might have been several billion dollars less on these days but, more critically from the Desk's perspective, those levels would have been less predictable. The Treasury's total cash holdings peaked on December 29 at a level of $94 billion (higher than the year-end level) while the highest balance reached in the Fed account was $28 billion on December 31.[2]

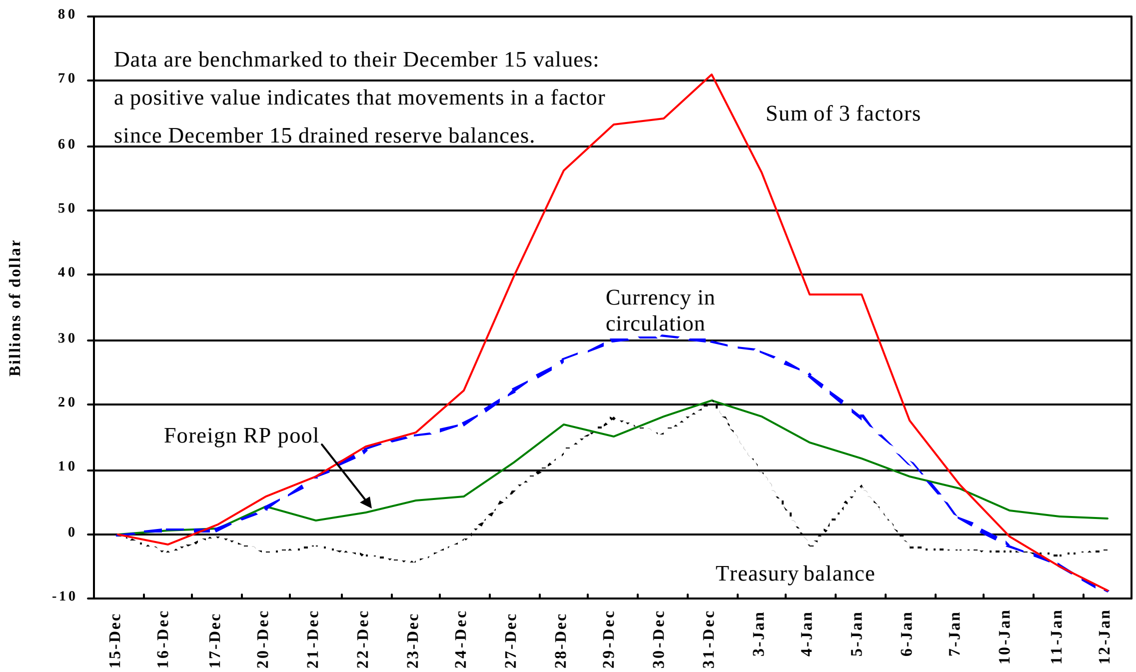
The foreign RP pool, an overnight investment facility that the New York Fed offers to foreign central banks and international institutions, also increased sharply ahead of the year-end as many participating accounts placed above-normal cash balances with the Fed temporarily for precautionary purposes. The total size of the RP pool fluctuated through most of the year in a range around $17 billion, but in the final days it rapidly rose to a record high of $39 billion on the year-end, draining reserves, before quickly receding. To improve the predictability of the daily RP pool, the New York Fed made some temporary changes in the administration of this facility in anticipation of heightened participation around year-end. It tightened its requirements for advance notification of investments by foreign customers and left itself more scope to

[2] Neither was a record. Higher cash positions had been reached during previous April tax seasons. Treasury's highest total cash position was $100 billion reached in April 1998 (with a $42 billion balance at the Fed the same day), and the highest-ever Fed balance was $54 billion reached in April 1997 (with a $89 billion total balance the same day). The Treasury's maximum Fed balance over the April 1999 tax season was a fairly unremarkable $10 billion, with a peak general balance of $76 billion.

Chart 4

IMPACT OF MOVEMENTS OF KEY FACTORS FROM DECEMBER 15 ON RESERVE DEFICIENCIES

daily levels



choose between investing unexpected placements in the RP pool, which would drain reserves, or in alternative facilities that would be reserve neutral.

Over the last two weeks of the year, the climactic run-up in currency, rise in the Treasury balance and increase in the foreign RP pool combined to create an unprecedented drain on reserve supplies in a condensed time frame, but one that unwound just as quickly. Between December 15 and December 31, movements in these factors drained $70 billion from the supply of balances (Chart 4). This drain came on top of the huge reserve deficiencies that had already been created by seasonal and CDC-related movements in currency over the preceding two months. But by mid-January, most of these movements had been reversed, and currency remained on a sharply downward path.

Foreign currency and SDRs

Declines in these two categories over the year combined to drain about $6 billion of balances. On March 18, the Fed’s holdings of foreign currency fell by a net $3.3 billion, reflecting the sale of about $4.8 billion of euros to the Treasury’s Exchange Stabilization Fund (ESF) in exchange for yen and dollars. This re-balancing of foreign currency portfolios was designed to make the dollar values of the euro and yen holdings of the Fed and the ESF approximately equal. Also during 1999, the ESF redeemed $3 billion of Special Drawing Rights (SDR) certificates it had issued to the Fed.

Table 3

Maintenance Period Revisions to Initial Estimates of Key Determinants of Reserve Balance Supply

average absolute revisions to initial estimates of maintenance period average values
(millions of dollars)

	1997	1998	1999 excluding 12/29 period	1999
Factors Affecting Supply of Reserve Balances				
Currency in circulation	361	500	619	793
Treasury balance	1002	506	296	383
Foreign RP Pool	500	381	506	608
Float	227	312	331	341
Net Factor Revision*	1413	885	1073	1463

Note: Projection errors are based on New York staff estimates.
* Net revisions to all factors that affect the supply of reserves. Data prior to 1999 also includes revisions to initial estimates of applied vault cash.

Volatility and predictability of key factors affecting supply

Excluding the final maintenance period of 1999 (period ended December 29), the revisions to initial period-average estimates of currency tended to be somewhat greater in absolute terms than in previous years, reflecting the large and uncertain movements in that factor related to the CDC (Table 3). Average revisions to other key factors for most of the year were closer to levels experienced in previous years, and in the case of the Treasury balance, smaller. But the revisions to the initial period average estimates of several key factors in the final maintenance period ahead of the year-end were very large, which significantly raised the yearly average revisions for several factors.

Daily volatility of currency was higher in 1999, again largely reflecting CDC-related developments, whereas daily movements in other factors averaged about the same or were lower than in the preceding year (Table 4). Daily forecast misses, even for currency, were not remarkably different in 1999 from the preceding year. However, over the two maintenance periods that surrounded the year-end, covering the days from December 16 through January 12, movements in most factors were much higher than at other times during 1999. The efforts to improve the predictability of currency and the Treasury balance did not prevent some deterioration in the daily forecast misses for these factors, although the increase in the misses was proportionally much smaller than the rise in volatility for each of these factors around the CDC. For currency, the uncertainty about its behavior in the days immediately after the year-end centered on the pace at which it would be returned to the Fed, which generally proved to be much faster than first anticipated.

B. Required Demands for Federal Reserve Balances

Total required balances is an accounting yardstick that measures the two-week average level of balances depository institutions must hold at the Federal Reserve in a maintenance period to meet all of their requirements. Total required balances is the sum of required reserve balances plus required clearing

Table 4

Daily Changes and Forecast Misses in Key Determinants of Reserve Balance Supply

Average and maximum of absolute values

(millions of dollars)

	1997		1998		1999		12/16/99-1/12/00	
	average	**max.**	**average**	**max.**	**average**	**max.**	**average**	**max.**
Daily Change								
Currency in circulation	679	2,474	709	2,788	896	5,379	3,548	8,087
Treasury balance	1,484	17,393	1,413	22,571	887	7,446	4,226	11,323
Foreign RP Pool	542	6,989	500	6,193	572	6,049	2,383	6,049
Float	548	4,605	791	5,449	693	6,217	619	1,600
Net value	1,896	18,366	1,751	23,727	1,946	17,629	7,875	20,188
Daily Forecast Miss								
Currency in circulation	200	980	217	999	234	1,361	585	1,648
Treasury balance	726	5,969	620	3,407	608	3,284	1,127	2,439
Foreign RP Pool	203	1,433	150	935	224	1,817	198	497
Float	312	3,433	383	2,386	393	4,274	336	700
Net value	848	5,991	744	3,664	878	5,005	1,135	2,482

Note: Forecast misses are based on New York staff estimates. "Net value" reflects offsetting movements and forecast misses of the aggregate of the four factors listed.

balances, and required reserve balances is defined as the portion of reserve requirements not met with applied vault cash.[3] Total required balances represent the principal source of banks' demand for balances at the Fed. Total required balances also is used to calculate excess reserves, which is measured as the difference between the aggregate supply of balances at the Fed and total required balances.[4]

In recent years, movements in the level of total required balances have been relatively modest in absolute terms, and so have not had much influence on the size of the System Open Market Account portfolio. Since the reversion to lagged reserve accounting in 1998, the possibility of revisions to reserve requirements and applied vault cash also has ceased to be an important consideration in the selection of specific temporary open market operations. However, declines in total required balances over recent years have accumulated to the point where the typical end-of-day level of balances that the Desk has aimed to provide through its open market operations has become a consideration in its deliberations. The implications of low levels of total required balances for excess reserve demands and for the behavior of the

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[3] As-of adjustments also affect the level of balances depository institutions must hold in their Fed account to meet maintenance period requirements, but their influence is usually relatively small and is not reflected in this definition of total required balances. Instead, they are treated in the conventional manner as a factor affecting the supply of reserves in this report.

[4] For the calculation of reserve measures, required clearing balances is scored negatively against nonborrowed reserves, while applied vault cash is counted positively towards nonborrowed reserves. Thus, excess reserves may also be (and usually is) calculated as the total supply of reserves minus reserve requirements.

federal funds rate have been discussed in past reports, and new developments for 1999 are presented in Section IV.A of this report.

Required Reserve Balances: Required Reserves less Applied Vault Cash

Required reserve balances have been on a declining trend in recent years as programs by depository institutions to “sweep” reservable liabilities into nonreservable liabilities have led to a significant decrease in required reserves, while levels of applied vault cash have remained fairly steady. In 1999, sweep programs continued to expand, but at a less rapid pace than in 1998.[5] Most of the associated decline in required reserves was concentrated at banks whose required reserve balance already was zero (i.e. “nonbound” institutions), or at some larger institutions that preserved a small positive required reserve balance by taking steps to reduce their applied vault cash level in a parallel fashion. As a result, through much of the year sweep activity had only a small net impact on the absolute level of required reserve balances, although the decline represented a significant portion of the remaining total (Chart 5).[6]

Late in the year, applied vault cash rose, reflecting the buildup in total vault cash ahead of the century date change. In absolute terms, the rise in applied vault cash was small measured against the size of the buildup in total vault cash, because most of this buildup in total vault cash occurred at nonbound banks that already met their reserve requirements with vault cash holdings (Chart 6). But again, the associated decline in required reserve balances, while modest in absolute terms, represented a significant share of the total level. By late in the year, required reserve balances had fallen to historic lows of under $4 billion, compared to levels of $7 billion late in 1998 and over $10 billion in year-end periods just three years ago.

Required Clearing Balances and Total Required Balances

Required clearing balances have been relatively steady in recent years, so changes in total required balances have tracked changes in required reserve balance levels (Chart 7). In recent months, the balances banks hold to meet clearing balance requirements, which are not counted as reserves, routinely surpassed the amounts held to meet reserve requirements.

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[5] In the twelve months ending in December 1999, the additional amount of deposits initially swept by banks totaled $50 billion, which was mostly accounted for by banks expanding existing sweep programs. The increase over the prior twelve-month period was $64 billion. Sweeps expanded by $114 billion over the twelve months ending December 1996, the largest change over any calendar year.

[6] The values for vault cash shown in Charts 5 and 6 are two-week maintenance period average holdings eligible to be used to meet reserve requirements. Under lagged reserve accounting rules, these vault cash levels were held about four weeks earlier than the date indicated. The total and surplus vault cash values in Chart 6 correspond to data from the H.3 release, which excludes holdings by institutions that had no reserve requirements. For these reasons, the vault cash data in these charts are not directly comparable to the vault cash values plotted in Chart 2.

Chart 5

REQUIRED RESERVE BALANCES:

REQUIRED RESERVES LESS APPLIED VAULT CASH

levels; maintenance period averages

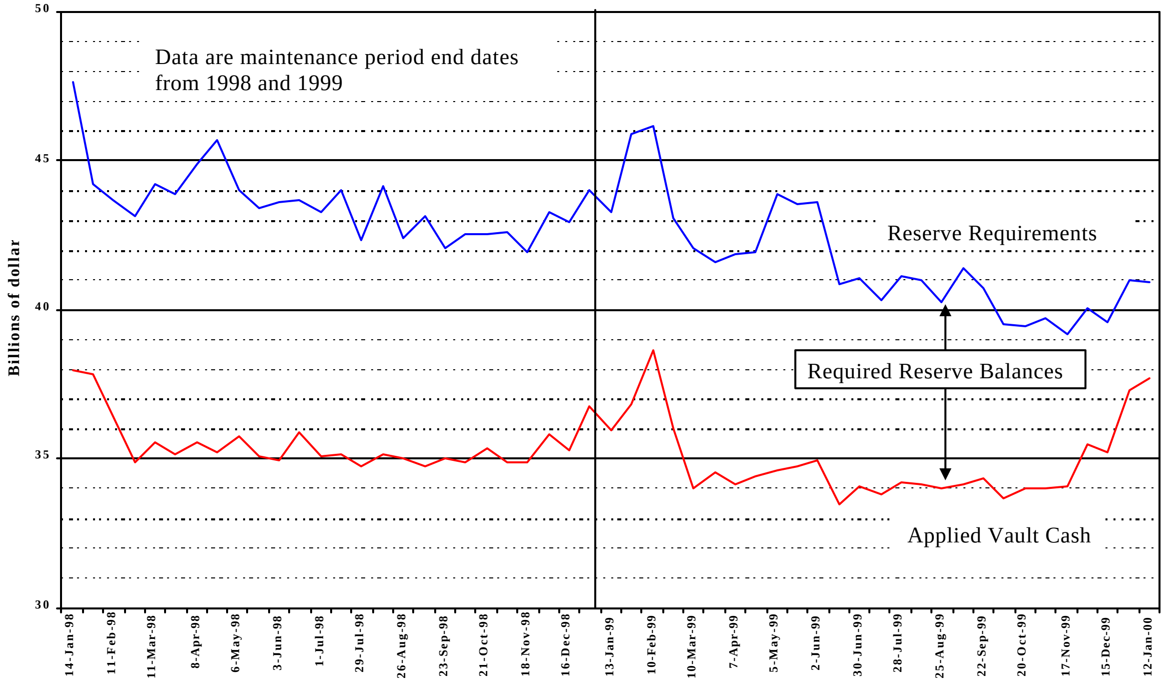


Chart 6

VAULT CASH: TOTAL, APPLIED, AND SURPLUS

levels; maintenance period averages

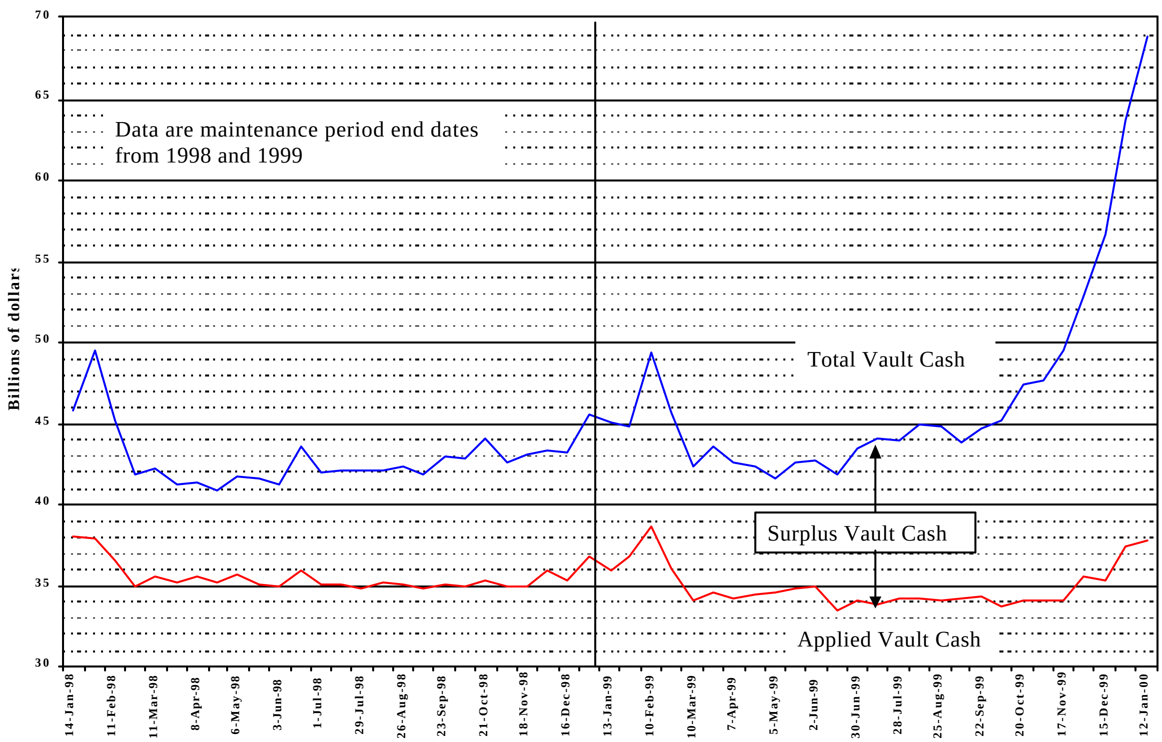
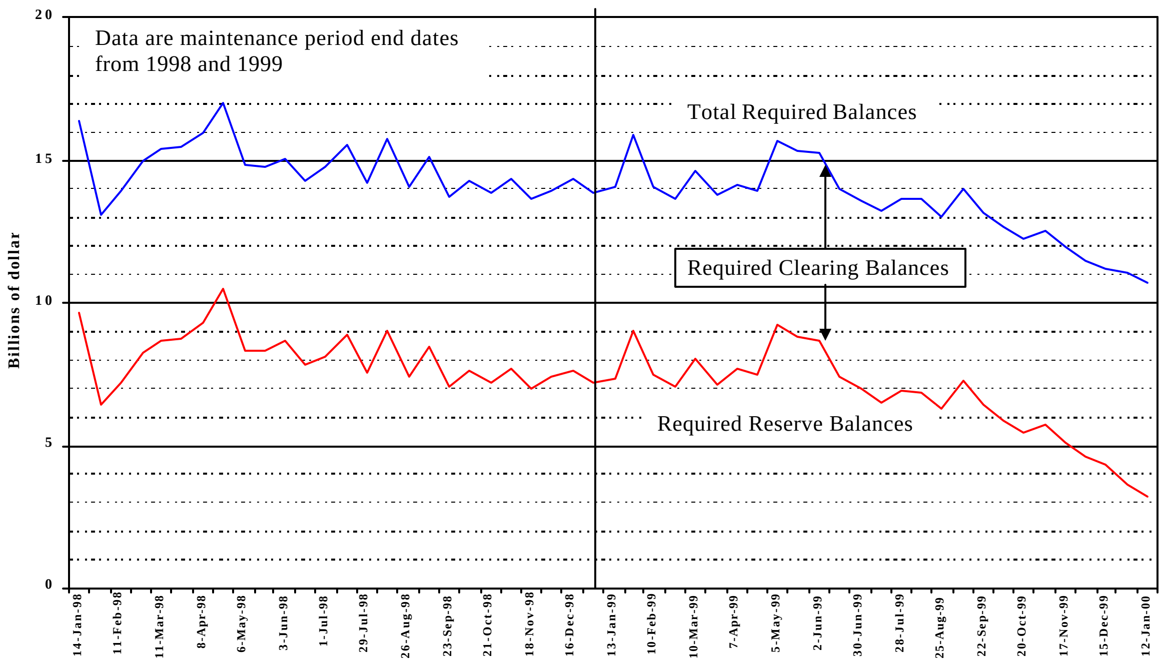


Chart 7

TOTAL REQUIRED BALANCES:

REQUIRED RESERVE BALANCES PLUS REQUIRED CLEARING BALANCES

levels; maintenance period averages



III. SUMMARY OF OPEN MARKET OPERATIONS IN 1999

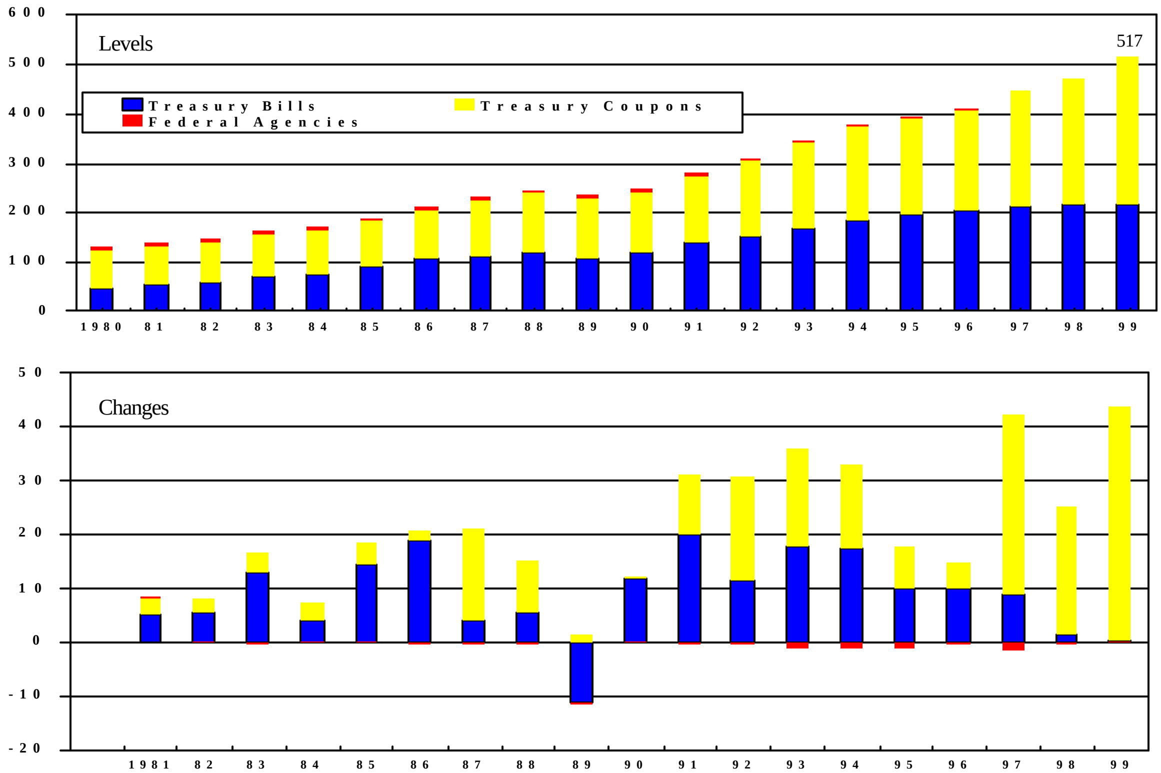
A. Desk Activity Affecting the System Open Market Account Portfolio

In 1999, the portfolio of domestic securities in the System Open Market Account (SOMA) expanded by a record $44 billion, surpassing the previous record of $41 billion set in 1997. At the end of the year, the SOMA stood at $517 billion (Chart 8).[7] All of the expansion was achieved though outright purchases of Treasury securities in the market; there were no purchases made from foreign accounts. In total, the Desk bought $45 billion (par value) of securities in the market in 1999. Redemption activity was small, and there were no sales of securities.

As has been the case for several years, the expansion of the SOMA portfolio in 1999 was needed largely to offset the drain to the supply of balances in depositories' Fed accounts created by the growth of currency over the year. The Desk's outright market purchases were timed to keep pace with the rapid, permanent portion of the expansion of currency that was evident throughout the year. Outright activity was not heavily influenced by the temporary buildup in currency linked to century date change demands that came

[7] All figures on SOMA holdings in this report are par values unless otherwise stated and exclude any securities held on RPs outstanding. Reported Treasury bill holdings include those sold to foreign accounts under matched-sale purchase agreements. Reported changes and levels of Treasury coupon securities do not include the accrual of compensation for the effects of inflation on the principal of inflation-indexed issues. At the end of 1999, these accruals totaled $228 million, up from $79 million at the end of 1998.

Chart 8
SOMA PORTFOLIO OF TREASURY AND FEDERAL AGENCY SECURITIES
year-end values
Billions of dollars



late in the year (Chart 9). Through the first half of the year, outright market purchases totaled $30 billion, a record amount for any first half-year period, while total purchases in the final quarter of the year were not remarkable by comparison to past years.[8]

The Desk continued to segment its market purchases of Treasury coupon issues into separate tranches covering different portions of the yield curve, with one operation restricted to all outstanding Treasury inflation-indexed securities (TIIS). Altogether, 51 different market operations were arranged in 1999 (on 45 different days). For the second consecutive year, the Desk purchased no bills in the market because it felt that SOMA holdings already represented a significant share of the total outstanding supply of bills.

A portion of the original maturity 7-year notes held in the SOMA portfolio that matured in 1999 was redeemed. The Desk held $2.9 billion of such notes that matured during the year, all on dates when new Treasury inflation-indexed securities settled. Maturing notes equal in value to 5 percent of TIIS issued

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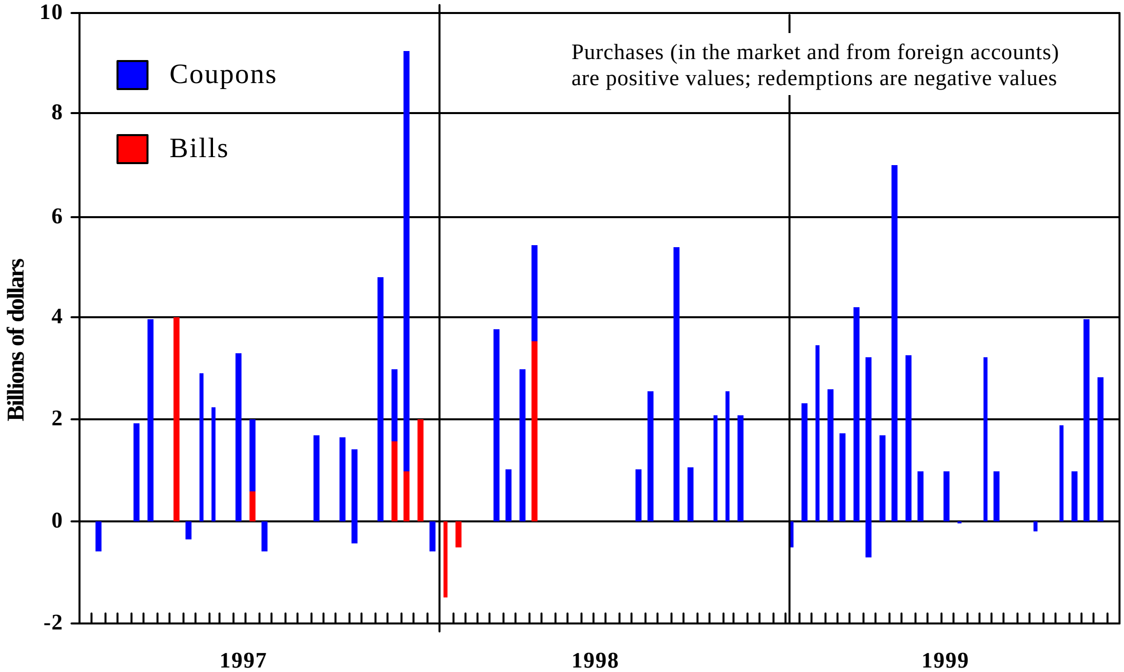
[8] The $8 billion of long term RPs arranged in December 1998 that matured shortly after that year-end contributed to the need for outright activity early in 1999.

Chart 9
PURCHASES AND REDEMPTIONS OF TREASURY COUPONS AND BILLS
maintenance period totals



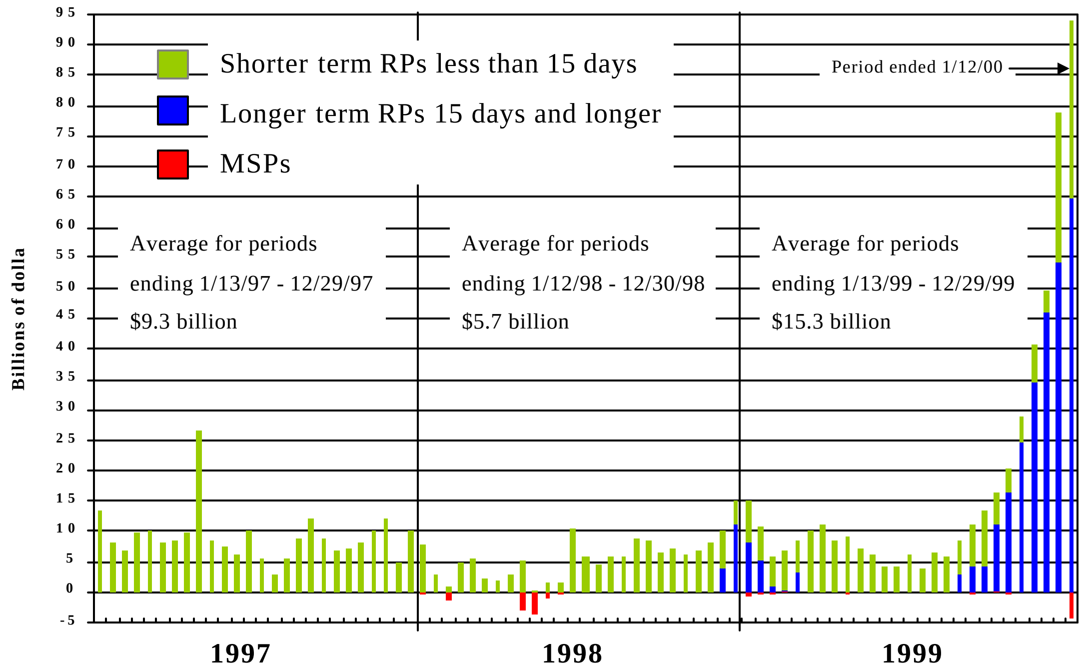
were exchanged for TIIS, and the remainder of maturing notes, totaling $1.4 billion, was redeemed. With the exception of these maturing 7-year notes, all maturing Treasury coupon securities were exchanged for new notes issued on the corresponding maturity date. On each such date when more than one Treasury auction settled, the maturity distribution of newly acquired issues was proportional to the total amounts issued. As it has done since mid-1997, the Desk redeemed all maturing holdings of federal agency securities, $157 million altogether, which left $181 million of agency holdings in the SOMA at the end of the year.

The buildup in holdings of Treasury coupon securities brought the average maturity of all Treasury issues in the SOMA portfolio up to 50 months by the end of 1999, 3 months higher than one year earlier. The percentage of all outstanding Treasury coupon issues that were held in the SOMA portfolio increased to 12 percent, from 10 percent one year earlier, reflecting the large expansion in the value of coupon issues in the SOMA portfolio and declining net Treasury coupon issuance. The percentage of total outstanding Treasury bills held in the SOMA portfolio at year-end slipped to 29 percent, from 32 percent a year earlier. But this decline largely reflected the increased supply of bills issued by the Treasury to build up temporarily its cash holdings for over the year-end.

Chart 10

RESERVE IMPACT OF TEMPORARY OPERATIONS

levels, maintenance period averages



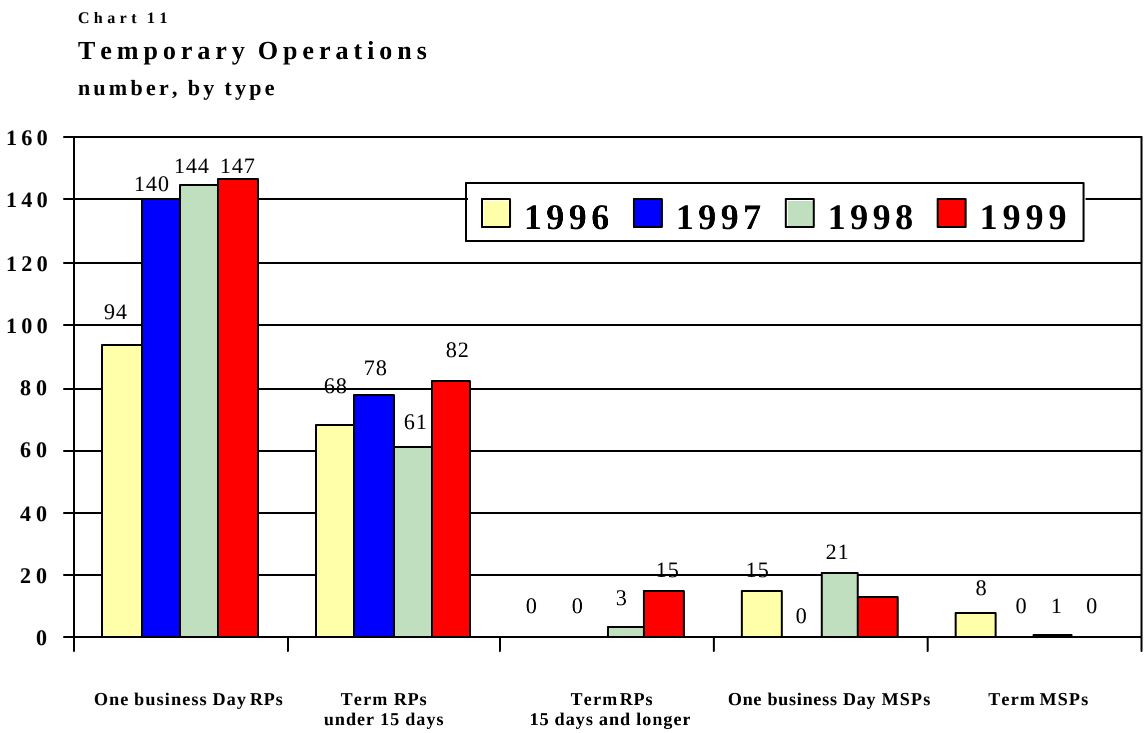
B. Temporary Open Market Operations

Frequency of temporary open market operations

In size and in frequency, the Desk greatly expanded its use of temporary operations in 1999. To a large degree, this increased usage reflected the extraordinary reserve deficiencies the Desk faced linked to the century date change that were expected to be temporary in nature. The value of RPs outstanding in the maintenance periods of 1999 averaged $15 billion, compared to $6 billion in the previous year and $9 billion in 1997 (Chart 10).[10] But the huge levels of outstanding RPs in the final months of the year accounted for much of the increase in this average in 1999; RPs outstanding through September averaged $8 billion. The number of RPs arranged in 1999 totaled 244, also up from the previous year, then a record, of 208 (Chart 11). Because of the Desk’s longstanding preference to leave reserve shortages that must be addressed with RPs after accounting for outright activity, the Desk used matched sale-purchase agreements relatively infrequently.

The most commonly chosen maturity on all RPs remained one business day (which includes RPs that also cover a weekend or holiday), of which 147 were arranged in 1999. This maturity is particularly useful for addressing marginal changes in reserve supply and demand from day to day, and for dealing with the

[10] This average covers the twenty-six maintenance periods ending on December 29, 1999. The first part of the period ending January 13, 1999 includes some dates from 1998, and average RPs outstanding from the first few periods of 1999 reflects the reserve impact of some long-term RPs arranged in December 1998.



uncertainty inherent in the forecasts. The Desk has relied on these single business day RPs over the past three years much more than it had previously. [11]

One significant innovation in 1999 was the Desk's increased reliance on longer term RPs. While any maturity division between long-term and short-term RPs may be somewhat arbitrary, a convenient distinction can be drawn at fifteen days, because the reserve impact of RPs with this maturity or longer by definition must fall in more than one maintenance period. Operations that carry a maturity of 14 days or less have almost always been used to address reserve shortages within a single maintenance period. In December 1998, three such long-term operations were arranged, to help address large seasonal reserve deficiencies around that year-end period.[12] In 1999, a total of fifteen such long-term operations were arranged, twelve of them in the final quarter of the year and maturing in January or February 2000.

The Desk's practice remained to arrange temporary operations at one preset time of day, moving this normal market entry time up by one hour to around 9:30 a.m. in April. Longer term RPs were usually arranged at 8:30 a.m. There was no need to await a complete set of reserve estimates before executing

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[11] In recent years, the Desk has greatly curtailed its use of withdrawable term RPs, and in 1999 none were arranged.

[12] Until November 1998, the FOMC only authorized RPs of fifteen days or less. At that time the maximum maturity was increased to sixty days, and in August 1999 to ninety days.

theses long-term RPs, because they usually were not used to meet all of the reserve shortage expected for the day on which they were arranged. The Desk always remained prepared to adapt to circumstances and depart from these standard practices as needed, which in particular it often did in the period around the year-end. On several occasions, shorter term RPs were arranged earlier in the morning, while some long-term RPs were arranged at the usual market entry time.

Six RPs with forward settlement dates were arranged in 1999. A 3-day forward RP executed in June to cover the June quarter-end was the first forward operation arranged since December 1990. The remaining five operations were arranged in December 1999 and put reserves in place over the year-end. Each of these operations covered a date when a very large reserve need was anticipated, but one for which the Desk was not confident it would receive enough propositions if it were to wait until that day to arrange operations to cover the entire estimated reserve deficiency. Forward RPs also were used to help establish a visible market presence ahead of days when rate pressures in financing markets might be expected to be particularly intense, with the intent to reduce some of the market's uncertainty about the Desk's commitment to provide adequate liquidity. Use of these operations, however, remained limited by the uncertainty associated with advance reserve projections.

The Desk arranged two RPs that matured on Good Friday (April 2), a day that financing markets are traditionally closed, because of a large projected decline in reserve needs that day from the preceding day. Dealer participation was minimal, and the Desk was not able to arrange operations of the desired size. Similarly, the Desk arranged an RP on December 24, a date for which the Bond Market Association had recommended financing markets be closed. Dealer participation was again low, but because of the proximity of the date to the year-end and the Desk's advance indication of its possible desire to arrange an operation on that day, propositions were sufficient to cover the desired size of the operation.

The Desk sold options on overnight RPs to dealers as part of its century date change reserve management strategy. As it turned out, financing rates did not reach levels that triggered the exercise of any of the options. Consequently, they had no impact on the number of RPs arranged during the year or on reserve supplies. The detailed structure of the options and the role they played in the Desk's reserve management strategy around year-end are described in Section IV.B.

Triparty RPs with the Expanded Pool of Eligible Collateral

On October 6, the Desk began arranging RPs that accepted the expanded pool of collateral under its temporary authorization and that settled under triparty arrangements established at two clearing banks. All RPs subsequently arranged in 1999 took this form.

Accepting a broader pool of collateral and settling RPs under triparty agreements had several benefits. Expanding the types of securities accepted as collateral on RPs, most importantly to include mortgage-backed pass-through securities, helped ensure that the Desk could address reserve shortages of even larger sizes. On triparty operations, dealers can substitute collateral on outstanding RPs on a daily basis (within a given collateral class as described below), whereas rights of substitution are limited on the Desk's delivery versus payment operations.[13] Finally, propositions on triparty RPs are valued in money amounts, not par amounts as is the case on delivery-versus-payment operations. This change effectively eliminated the reserve projection error associated with the difference between the money and par amounts of selected propositions.

Reflecting these advantages, the total coverage ratio—the ratio of total propositions to accepted propositions—on triparty RPs averaged 6-to-1, compared to an average ratio of 4-to-1 on delivery-versus-payment RPs arranged over the preceding year, even as the size of outstanding RPs grew significantly over the fourth quarter.[14] Over the past five years, there were only a handful of occasions when the Desk wanted to add more reserves than it was able to because of insufficient propositions by dealers, but the expanded collateral pool combined with the earlier entry time, and attractiveness of triparty operations for dealers, have minimized this risk. There were no occasions in 1999, apart from the RPs that matured on Good Friday, when total propositions on an RP fell short of the intended size of the operation.

Structurally, almost all RPs executed after October 6 were arranged as three separate, simultaneous operations, each distinguished by the class of collateral accepted. On one operation, only Treasury collateral could be submitted, on a second operation straight agency debt could be pledged (in addition to Treasury collateral), and on the third operation mortgage-backed collateral (in addition to the other two types) could be submitted. But for purposes of this report, these separate operations are counted as different tranches of a single RP. Only three exceptions were made to this practice in 1999: in late December three forward triparty RPs were arranged that included just one tranche on which all collateral types were eligible.

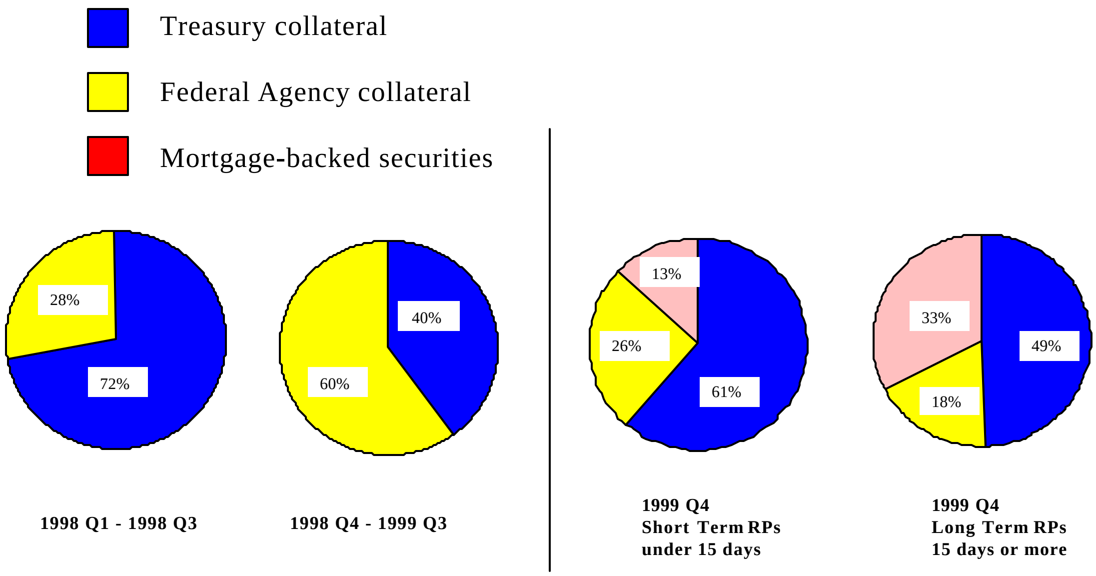
The multi-tranche approach gave the dealers the opportunity to price separately their repo propositions according to the type of collateral involved. In determining what mix of collateral among the three types to accept, the Desk used a relative cost method. It used market quotes on current RP rates of the relevant term

[13] The Desk offers no right of substitution on delivery-versus-payment RPs with terms under 15 days, one right of substitution on RPs with terms of 15 to 30 days, and two rights of substitution on RPs above 30 days.

[14] All RPs that crossed the year-end date, including all forward and long-term RPs, were excluded from this calculation to eliminate any possible influence of year-end distortions on the level of propositions. Still, shifting reserve and financing conditions make this comparison only suggestive.

Chart 12

DISTRIBUTION OF COLLATERAL ACCEPTED ON DESK RPS



Each chart shows the average of the distributions of accepted collateral on all operations during the corresponding time period. Data from 1999 Q4 for short-term operations excludes forward RPs and operations that crossed the year-end.

for each of the three different collateral types as benchmarks for assessing the relative value of the propositions it received. Thus, for each RP, the allocation of accepted propositions among the three collateral categories was "market neutral" with respect to then-existing market rates.

Previously, under the delivery-versus-payment settlement format, the Desk made no distinction between Treasury and federal agency debt in its selection procedures. Given the modestly higher RP rates at which agency securities are typically financed, these propositions had begun to crowd out Treasury securities on RPs, placing those dealers who had been seeking to finance Treasury securities with the Desk at a comparative disadvantage.

Technical limitations in existing processing systems make it impractical for the Desk to execute two multi-tranche operations with different maturities simultaneously. As a result, when the Desk wanted to arrange two RPs with different maturities around the same time, in the announcement sent to dealers soliciting propositions on the first operation, the Desk also indicated its intention to arrange a second operation as soon as the selection process for the first operation was completed.

The expansion of types of collateral accepted on Desk operations and changes in selection methodology altered the distribution of collateral held under RPs (Chart 12). For many years, dealers had delivered mostly Treasury securities on Desk RPs. In October 1998, the rate at which federal agency securities could be financed in the RP market rose far above the financing rate for Treasury collateral, reflecting relative risk preferences in the market at the time. This gap made many dealers aware of the advantages of delivering agency collateral on Desk RPs because the Desk did not differentiate between collateral types in its selection and pricing. As a result, the relative proportion of agency securities held by the Desk on outstanding RPs jumped in the final quarter of 1998, and it remained high even after relative agency and Treasury financing rates returned to normal levels.

When the Desk started to accept mortgage-backed securities on its RPs in the fourth quarter of 1999, it also adopted its market neutral relative price method for selecting propositions according to the type of collateral pledged. This change in selection procedure likely contributed to an increase in the proportion of Treasury collateral accepted on Desk RPs relative to what it had been over the preceding year (but still below where it had been in earlier year), even with the wider pool of eligible collateral. On long-term RPs, the proportion of Treasury securities pledged as collateral during the fourth quarter, most of which spanned the year-end, was less than the proportion accepted on short-term RPs. This disparity partly reflected dealers' caution about committing Treasury collateral for terms over the year-end amid expectations that Treasury collateral could become relatively scarce at that time, and their desire to secure long-term financing first for their non-Treasury holdings.

IV. RESERVE MANAGEMENT, EXCESS RESERVES AND THE FEDERAL FUNDS RATE

A. General Developments in 1999

In recent years, declines in the level of total required balances had been linked to somewhat greater volatility in the federal funds rate and higher levels of excess reserves. In 1999, volatility of the federal funds rate was not appreciably greater, and there was no sign of a need for increased period-average levels of excess reserves, despite the further declines in total required balances.

General patterns of daily volatility in the federal funds rate in 1999--measured by median and average values of daily absolute deviations of effective rates from target and median values of intraday standard deviations in rates--were qualitatively similar to those observed over the first three quarters in 1998 and in other recent years (Table 5). Data from the fourth quarter of 1998 are excluded from these comparisons because of temporary developments at that time that were inflating reported measures of daily rate volatility.

There was, however, some indication that on days when actual levels of balances were at their lowest levels of the year, the possibility that intraday volatility in rates and adjustment borrowing from the discount window might become more elevated was perhaps marginally higher than on other days. In 1999, the actual level of balances--excluding those balances created through adjustment or SLF borrowing—fell

Table 5

Deviations of the Daily Effective Federal Funds Rate from Target and the Daily Standard Deviation of the Funds Rate

(in basis points)

	1997 Entire Year	**1998** Entire Year	**1998** Jan.1- Sep. 28	**1998** Sep.29- Dec. 31	**1999** Entire Year	**CDC** Dec. 16, 1999- Jan. 12,2000
Median of Standard Deviations	9	12	10	22	9	17
Median of Absolute Deviations of the Effective Rate from Target	6	8	6	16	7	11
Average of Absolute Deviations of the Effective Rate from Target	11	13	10	22	11	28

below $11 billion for the first time, doing so on 17 days.[15] The lowest balance was $9.9 billion recorded on January 8.[16] To gauge the impact that operating at the lowest levels of balances realized in recent years may have had on the behavior of the federal funds rate, daily data from the past two years were ranked by the level of balances, and the funds rate behavior on the lowest 25 dates (all but two of which fell in 1999) was compared with its behavior on other days. To control for the influence of other factors that often elevate rate volatility even in the presence of higher levels of balances, days following the second weekend of each maintenance period, high payment flow days, and dates from the final quarter of 1998 were excluded from these calculations.

The distribution of observations in Chart 13 does not point to a compelling, systematic link between lower balances and higher daily rate volatility as measured here. The average values of the intraday standard deviation and of borrowing (indicated in the table inserted in Chart 13) were higher, although median values were not much different (and even slightly lower). These higher averages largely resulted from a few days when volatility and borrowing levels were significantly elevated, suggesting that the probability that pronounced upward rate pressures and heightened borrowing will develop is marginally higher when operating balances are low.[17]

[15] These calculations exclude the balances created by adjustment and SLF borrowing at the discount window because these balances were not available to banks during the trading day. Balances created by seasonal borrowing were not removed from this measure, because banks could better anticipate the balances that would be created by their borrowing under the seasonal lending program.

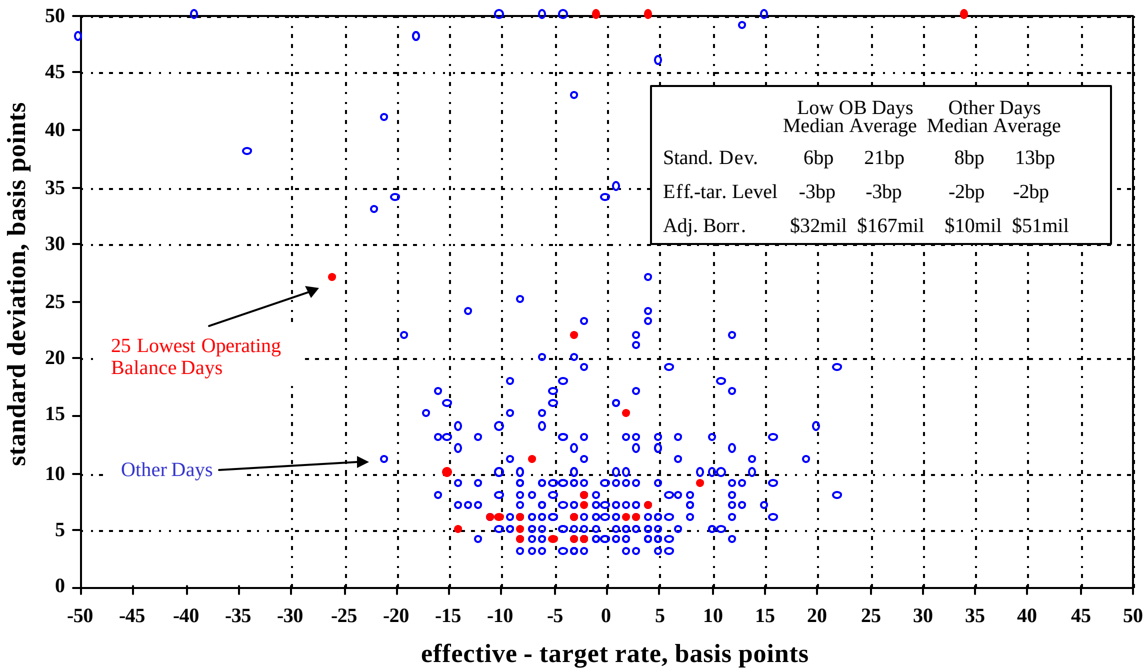
[16] In early 2000, even lower balances were reached given the levels to which total required balances had by then fallen and the Desk's efforts to work off the high excess positions accumulated around the year-end. These data are not included in the exercise described in this section.

[17] Bootstrap tests confirm that the differences for the averages reported here were statistically significant.

Chart 13

Deviations of the Daily Effective Federal Funds Rate from Target and the Daily Standard Deviations of the Funds Rate

25 Lowest Operating Balance Days vs. Other Comparable Days in 1998 and 1999



Maintenance period average levels of excess reserves showed a marked decline in 1999 from the levels that prevailed over most of the previous year, suggesting that total required balances had not reached a critically low level that would trigger needs for higher levels of excess reserves (Chart 14). In fact, excess reserve levels fell sharply early in the year from the higher levels provided in the fourth quarter of 1998, a time when the Desk was aggressively combating bouts of firmness in the federal funds rate. Over the balance of 1999, the Desk did not find it necessary to provide higher levels of excess reserves on any systematic basis even as the level of total required balances slipped further.

Maintenance period average deviations of the effective funds rate from target through the first three quarters of 1999 were similar to average deviations in prior years (Chart 15). The Desk's reserve management efforts during the fourth quarter of the year, described in Section IV.B, contributed to some persistent softness in that quarter, much like during the corresponding quarter of 1998.

Intraperiod patterns of excess reserve levels in 1999 conformed to historical benchmarks. The distribution of daily excess levels continued to reflect banks' preference for holding lower excess levels early in a

Chart 14

EXCESS RESERVE HOLDINGS BY BANK CATEGORY

maintenance period averages

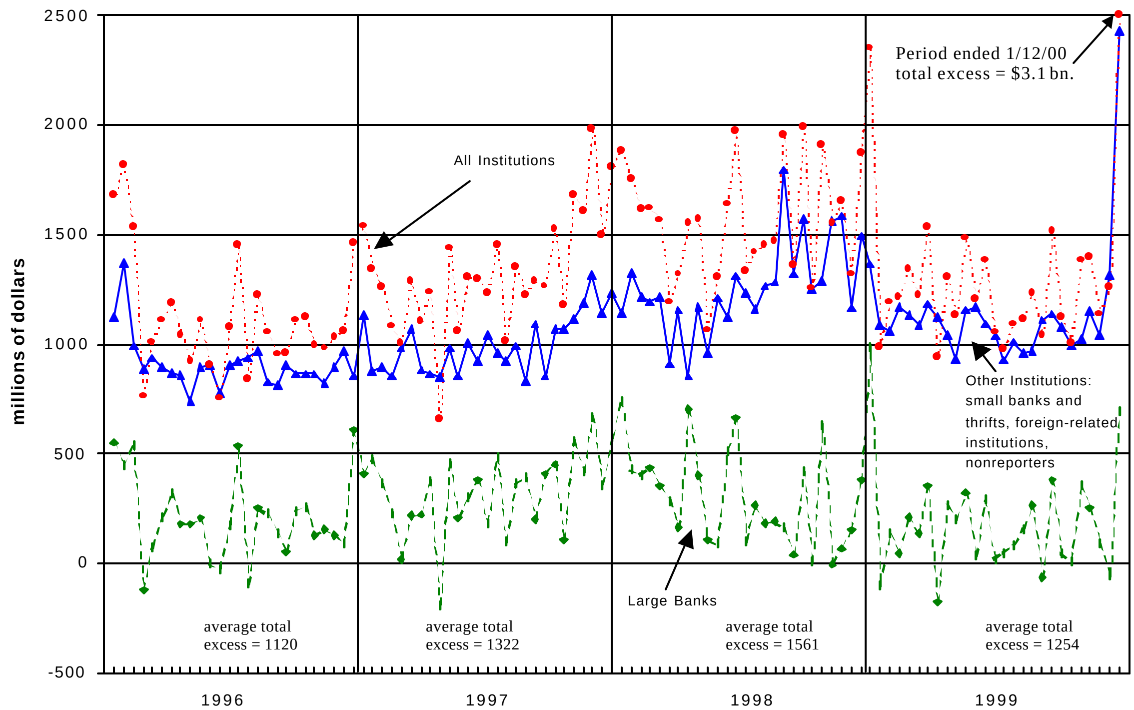


Chart 15

MAINTENANCE PERIOD AVERAGE EFFECTIVE FEDERAL FUNDS RATE

VERSUS TARGET RATE

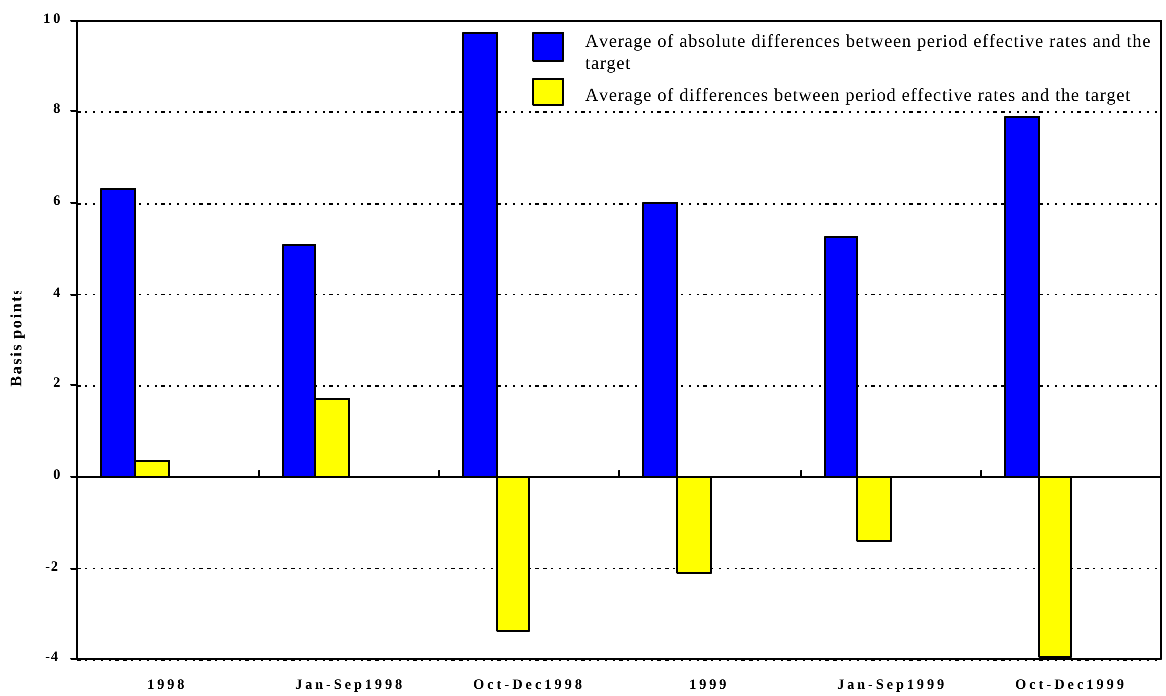


Chart 16

AVERAGE DAILY LEVELS OF EXCESS RESERVES

by day in a maintenance period; excluding as-of adjustments and high payment flow dates

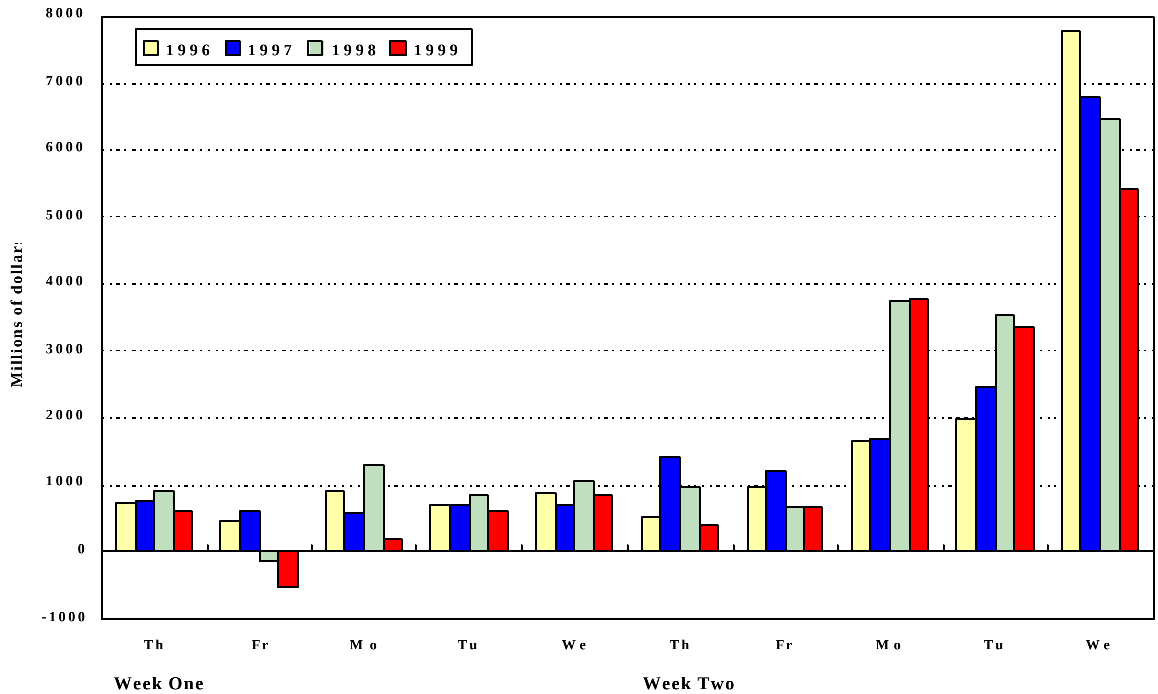
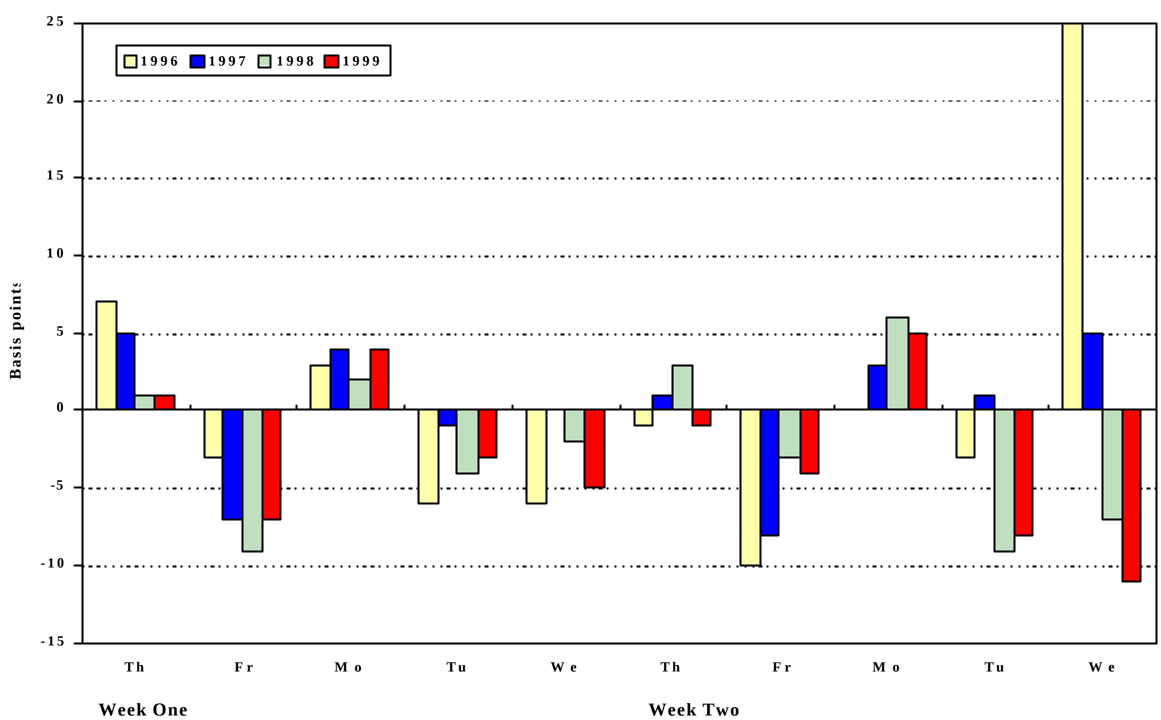


Chart 17

AVERAGE DAILY EFFECTIVE FEDERAL FUNDS RATE LESS TARGET RATE

by day in a maintenance period; excluding high payment flow days



maintenance period (Chart 16).[18] This strategy is designed to guard against inadvertently accumulating unusable excess reserve levels, even at the risk of paying high rates or borrowing at the discount window in the event of an unanticipated reserve shortfall on these days. In 1999, there was a slight tendency towards providing even fewer excess reserves in the early days of a period, while maintaining sufficiently high excess levels on the final three days to allow banks to meet their period average requirements.

The federal funds rate also retained its usual intraperiod characteristics of relatively low rates on Fridays and high rates on Mondays (Chart 17).[19] Settlement days remained on the slightly soft side, a pattern that emerged in the final quarter of 1998 but which has persisted, indicating that the somewhat lower period average excess levels banks were left with in 1999 were, if anything, slightly more than adequate for meeting demands.

B. Reserve Management around the Century Date Change

Background

Events associated with the century date change dominated reserve management efforts in the final quarter of 1999. In addition to the extensive testing necessary to ensure that all its technical systems would function as required after the rollover date, the Desk faced two broad challenges. First, early projections pointed to potentially unprecedented reserve shortages over the course of the final quarter of the year, peaking around the year-end. The Desk wanted to be in a position to meet the reserve deficiencies that were projected to develop even under the most extreme assumptions about the behavior of currency, the Treasury balance, and the foreign RP pool, and to do so without disrupting the markets in which it normally operates.

Second, there was widespread concern that participants in financing markets would be less willing to maintain normal levels of trading and market intermediation around the century date change, which threatened to interfere with the efficient allocation of credit in the financing markets more generally. The possibility of a shortage of Treasury collateral was also recognized, stemming from the large RPs that might be needed to address reserve shortages and from heightened investor demand for Treasury securities around the year-end because of their preferred risk characteristics.

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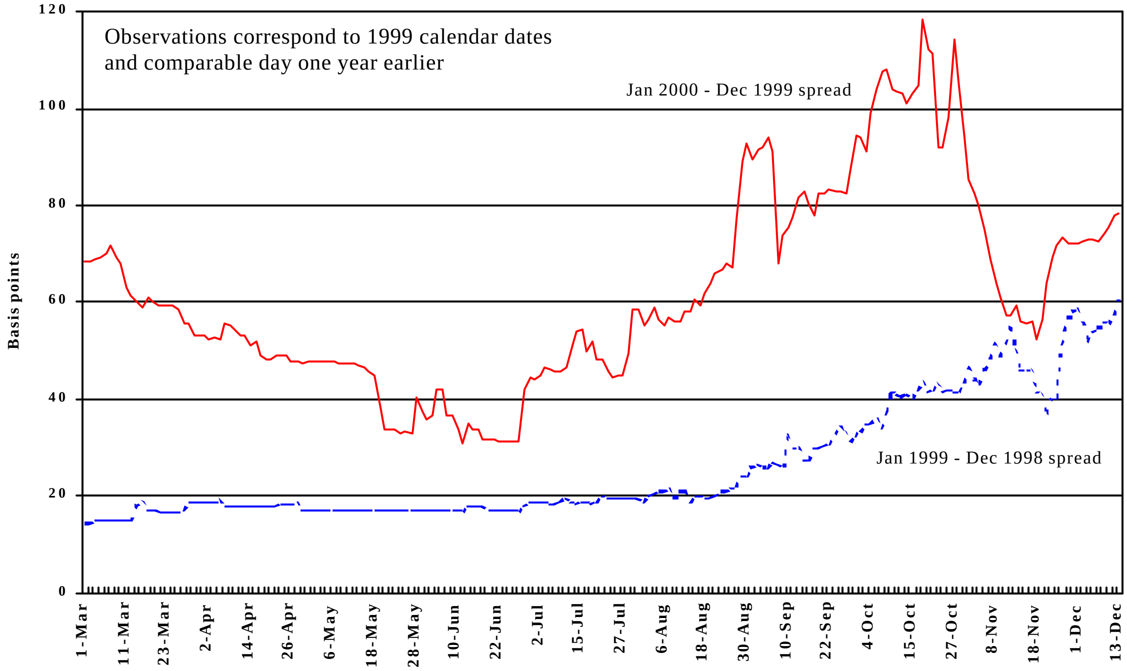
[18] The daily measures of excess reserves in this chart exclude the level of as-of adjustments, which do not affect actual balances. High payment flow dates—month-ends and major tax and Treasury coupon settlement dates—are excluded because of the elevated levels of excess provided on such dates regardless of the day in the maintenance period on which they may fall.

[19] High payment flow days are excluded from Chart 17 because the pronounced tendency for the funds rate to be firm on these dates can distort the comparisons, although their exclusion creates the illusion of a soft bias in the daily funds rate. These days fall with greatest frequency on Mondays because of their calendar treatment.

Chart 18
SPREAD BETWEEN DECEMBER AND JANUARY LIBOR CONTRACTS
Jan 2000 - Dec 1999 rate spread vs. Jan 1999 - Dec 1998 rate spread
daily levels



The concern about reduced liquidity in financing markets around the year-end translated into expectations for elevated financing rates for that time. As early as spring of 1999, spreads between monthly December and January Eurodollar futures rates were well above levels normally associated with year-ends in the past, and these concerns intensified over the summer months (Chart 18).[20] This CDC-premium exceeded the level observed in other major currency zones, partially reflecting the more limited access that broad categories of participants in U.S. financial markets, including foreign-based institutions, have to central bank financing facilities compared to the breadth of access characteristic of other countries.

As outlined above, the Desk initiated several measures in late summer and early autumn to put itself in a better position to manage reserve conditions through the fourth quarter and around the year-end itself. It extended the maximum maturity of repurchase agreements, expanded the pool of collateral accepted on temporary operations, established triparty relationships for settling temporary operations, and auctioned options on Desk RPs through the Standby Financing Facility. To meet any possible reserve contingencies, procedures were also established for draining reserves late in the day, but this capability was not utilized.

[20] The December 1999 Eurodollar futures contract covered the 30-day period beginning December 13, while the January 2000 contract covered the 30-day period beginning January 17. This spread is examined in place of the oft-cited "butterfly" spread that includes the November contract, because the November contract stopped trading well ahead of the year-end.

By extending the maximum maturity of repurchase agreements to 90 days, the Desk was able to begin meeting the seasonal and CDC-related buildup in year-end reserve needs starting in October, and it gradually layered in RPs of the needed magnitude. Beyond their direct reserve impact, these long-term RPs allowed the dealer community to pre-fund a significant share of their inventories through the year-end, reducing some of their anxieties at an earlier opportunity.

By expanding the types of securities it accepted as collateral on its RPs, most importantly to include a huge pool of mortgage-backed pass-through securities, the Desk went a long way towards ensuring that it would be able to address even the deepest projected reserve shortages with RPs. And it would be able to do so without aggravating pressures in the financing market for Treasury securities. Adopting triparty settlement arrangements was an operational necessity for accepting the broader collateral pool on RPs, but the greater flexibility that triparty arrangements gives dealers in managing their inventories was expected to be particularly beneficial in the environment leading up to the year-end.

The final measure was the creation of the Standby Financing Facility involving the sale of options on overnight RPs with the Desk for the period surrounding the year-end. Daily options were sold for all dates running from December 23, 1999 through January 12, 2000.[21] Holders of these options had the right to execute overnight RPs with the New York Fed at a preset "strike price" (financing rate) 150 basis points above the then-prevailing target federal funds rate, but they were required to notify the Desk of their intention to exercise by 10 a.m. The daily options were bundled into three separate weekly "strips" of overnight agreements, the first strip running from December 23 to December 29, the second from December 30 to January 5, and the third from January 6 to January 12. The daily options in the middle strip had the additional feature that allowed the holder to exercise as late as 11:30 a.m. at a strike price 250 basis points above the Fed funds target. A single-price auction format was adopted for the sale of these options. As on its ordinary RP operations, dealers could purchase options for their own account and on behalf of their customers, although the Desk's counterparty always was the dealer. On exercised contracts, dealers could submit collateral of their choosing; it was presumed that if options were exercised, those securities in the highest risk category—mortgage-backed securities—most likely would be delivered.

The purpose of these options 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. The Desk in effect wrote a form of "flood insurance" to the dealer community against potential worst case financing market contingencies around the year-end, thus providing the dealer community with the confidence to continue making markets to their customers and to one another under the 150 basis point umbrella that the options would provide.

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[21] The final terms for competitive bidding for these contracts were posted on October 7 on the New York Fed's website: www.ny.frb.org/pihome/news/announce/1999/an991007b.html.

In devising this program, the Desk considered the implications of these options for its management of reserves in the event they should be exercised. Given that the options were intended to provide a source of financing to securities dealers, and were not intended as a substitute means to meet projected reserve shortages, under many scenarios the Desk envisioned having to offset the impact of reserves created through the exercise of options. This reserve offset might be accomplished by cutting back on the supply of reserves provided through ordinary RPs if the amount exercised were relatively small and known before regular operations were arranged. Otherwise, the Desk would have to enter the market to drain reserves later in the day. If a widespread exercise of options were to be triggered by strong upward rate pressures and broad-based financial market dislocations, the Desk was prepared to abandon its normal reserve management focus on fine-tuning the daily level of reserve balances, and to accept a super-abundance of reserves created by the options as useful for countering market stress.

Reserve Management Developments from October to mid-December

In October, incipient reserve shortages began to deepen progressively as banks built up their vault cash holdings to meet anticipated CDC-related public demands. The Desk's strategy was to meet a large portion of these reserve shortages with temporary operations carrying extended maturities, and to refrain from increasing the level of outright purchases, because the shortages were expected to be temporary. On October 8, it arranged a 90-day RP, the first operation that was set to span the year-end. By December 15, $54 billion of reserves had been created through 10 RPs that spanned the year-end.[22] By comparison, outright purchases over all of the fourth quarter totaled $10 billion, a quantity in line with the amounts purchased in the same quarter in past years. Maturity dates on the RPs were staggered across January into mid-February, roughly coinciding with the time when movements in factors, primarily currency, temporarily draining reserves were expected to unwind. However, the Desk expected that a good portion of the RPs maturing in January initially might have to be replaced with new RPs.

Also during this time, the Desk conducted seven weekly auctions of options on Desk RPs, each of the three weekly strips being auctioned simultaneously once a week. The quantity of each strip that would be sold was announced ahead of each round of auctions. Beginning with the second round, the amounts sold at each auction were adjusted in response to the strength of demand seen the preceding week, with the ultimate objective being to provide financing insurance to dealers at relatively low cost. Altogether, $114 billion worth of options were sold on the strip covering December 23 to December 29, $223 billion of options on the strip from December 30 through January 5, and $144 billion of options for January 6 through January 12. The diminishing stop-out rates and quantities of propositions submitted on the final rounds of these auctions suggested that demand ultimately was satisfied (Table 6). Year-end forward rate premiums

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[22] This total includes the 21-day forward RP arranged on December 14 that settled on December 15.

Table 6

Standby Financing Facility:
Summary of Auction Results for Options on Desk RPs

Auction Dates:	Oct. 20	Oct. 27	Nov. 3	Nov. 10	Nov. 17	Nov. 23	Dec. 1
December 23 – December 29 Strip							
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
December 30 – January 5 Strip							
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
January 6 – January 12 Strip							
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.

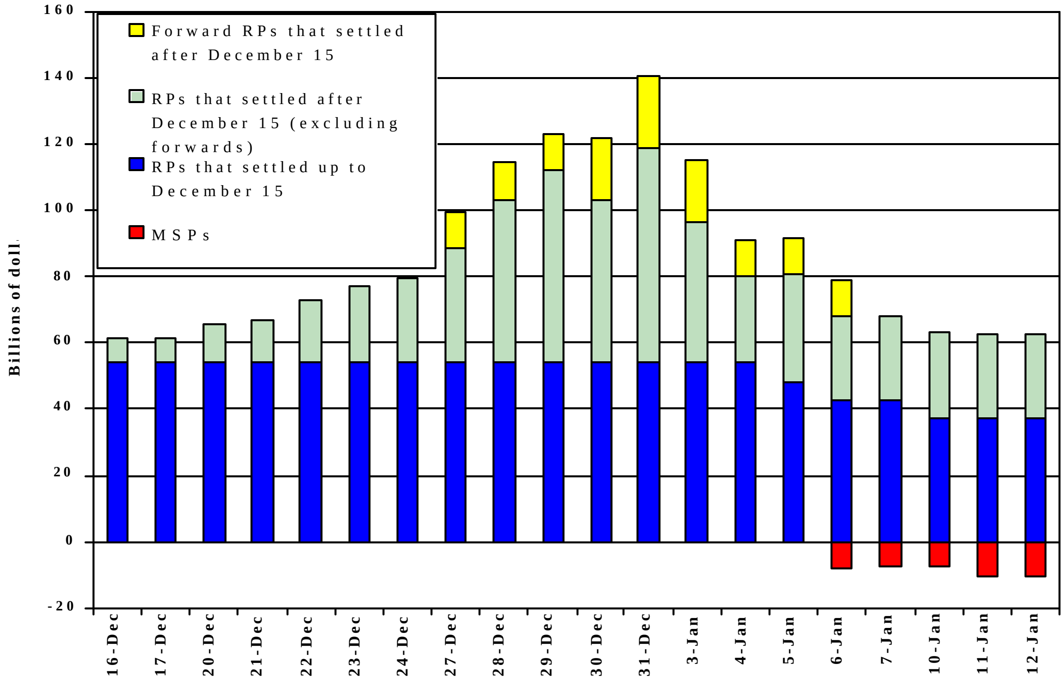
fell back sharply shortly after the actual sale of options had begun, and many market participants cited the program as an important factor contributing to increased market confidence about the year-end.

Through mid-December, the Desk largely adhered to normal reserve management practices in determining levels of excess reserves to leave in place each day. Some small conscious effort was made to provide a level of reserves that would be a bit to the high side of the range of estimated demand, in order to prevent inadvertent reserve shortfalls from generating firm rate conditions that might become entrenched ahead of the year-end given existing market anxieties. Partly as a result, daily effective funds rates during the fourth quarter were slightly biased to the soft side, particularly over the last few days of several maintenance periods, although period average levels of excess reserves were not significantly higher than they had been earlier in the year. There were no unusual movements in the spread between overnight financing rates for different classes of collateral, either from the fed funds rate or between one another, that could be attributed to the growing size of the Desk's holdings of collateral or to market anxieties about the CDC.

Developments in the maintenance periods ending December 29, 1999 and January 12, 2000

Reserve deficiencies deepened sharply further in the days leading up to the year-end as the Treasury balance and foreign RP pool began their steep ascent while currency in circulation continued to grow. To ensure that reserve shortages could be met when they were projected to be at their deepest, and financing markets were potentially least capable of offering up new collateral for additional RPs, the Desk arranged a

Chart 19
RESERVE IMPACT OF TEMPORARY OPERATIONS SURROUNDING THE YEAR-END
daily levels

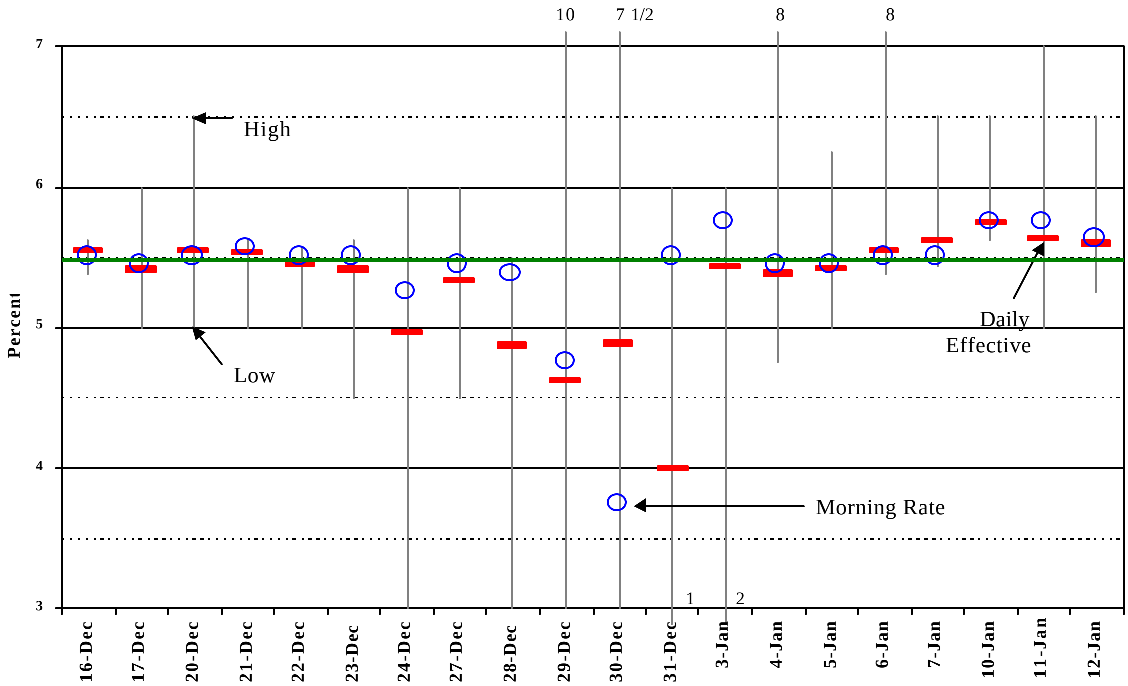


series of forward RPs. From December 15 through December 23, four forward RPs were executed that settled between December 27 and December 31 and that matured between January 3 and January 7. These operations put in place an additional $22 billion of reserves on the year-end itself (Chart 19).[23] In addition, another $65 billion of regular RPs were put in place after December 15 that spanned the year-end (and a small amount of additional outright purchases were made), making a total of $141 billion in RPs outstanding on December 31, far surpassing the previous $52 billion peak reached in April 1997. After the year-end, these quantities quickly began to subside as currency, the Treasury balance, and the foreign RP pool all began to taper off. Still, by January 12, the volume of RPs outstanding remained substantial at $63 billion (but with $10 billion of MSPs also outstanding).

The additions to reserve balances provided by these open market operations were needed to offset the impact of factors on the supply of reserves and were not designed to provide unusually high levels of excess reserves. Only on the year-end date itself and the first business day of 2000 were excess levels significantly elevated, although they were not particularly high by comparison to levels reached around past

[23] This count excludes the 21-day forward RP arranged on December 14 that settled on December 15. This operation was arranged in part to guard against the threat of a New York City transit strike that morning which might have interfered with the Desk's operational plans.

Chart 20
FEDERAL FUNDS RATE BEHAVIOR AROUND THE YEAR-END
daily range, morning rate, and daily effective rate



year-end dates.[24] Over the remainder of the maintenance period underway after the turn of the year (ended January 12), the Desk attempted to work down the high excess positions banks accumulated on the first few days of that period. But low levels of operating balances limited the pace at which it could do so, and at the end of that period banks were still holding an extraordinarily high period-average level of excess reserves.

In the federal funds market, a soft bias emerged in the days leading up to the year-end, despite the absence of particularly high levels of excess reserves (Chart 20). The accumulating level of outstanding Desk RPs astounded many market participants, who were largely unaware of the extent of the factor movements necessitating these operations. The size of these operations, coming against the background of the SFF and other Desk efforts to promote market liquidity around the year-end, fueled perceptions that the risks had become heavily skewed towards an overabundance of reserves developing. As a result, trading conditions often had a soft cast in financing markets. But with actual excess levels still sometimes falling short of end-of-day demands, rates occasionally backed up in late-day trading and intraday volatility was generally high, but not appreciably more than over other year-ends. Even on the year-end and first business day of 2000, the morning funds rate premiums were the lowest they had been on the corresponding days around the year-end in several years.

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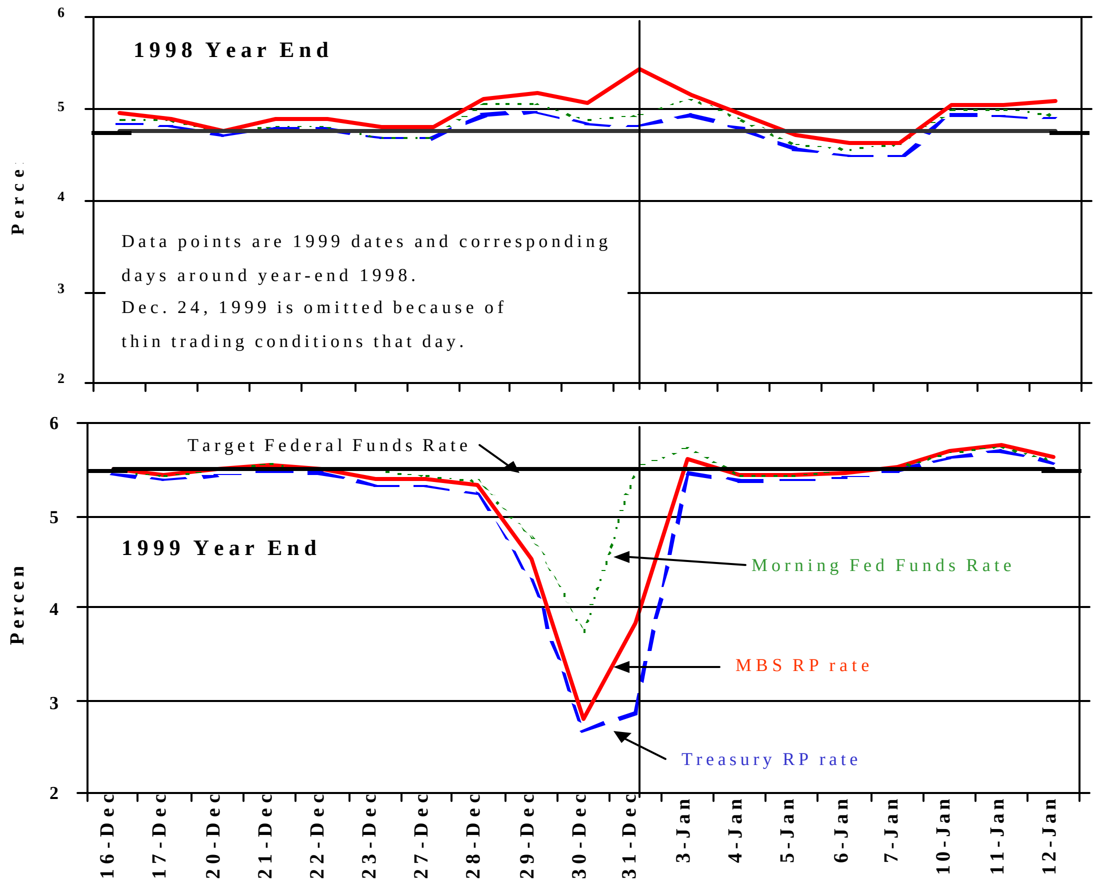
[24] The level of free reserves (excess less borrowings), reached on December 31 was $12.1 billion, and $3.2 billion on the first business day of 2000. The respective levels on the corresponding dates one year earlier were $12.7 billion and $5.2 billion.

Chart 21
TREASURY RP RATES, MORTGAGE-BACKED SECURITY RP RATES, AND FEDERAL FUNDS RATES AROUND YEAR-END
morning levels



The century date change itself did not cause any technical problems for the Desk or for market participants that affected trading conditions in the financing markets. But shortly following the rollover, a touch of firmness emerged and volatility remained elevated as the Desk began to work down the very high excess levels accumulated early in the January 12 maintenance period, sometimes pushing daily excess and balance levels to extremely low levels.

On two occasions during these maintenance periods around the CDC when reserves were particularly deficient, once before and once after the year-end, market arbitrage activity of large banks that borrowed at the SLF helped moderate late-day upward rate pressures that emerged. There had been two earlier episodes between October 1 and December 15 when arbitrage activity by large banks that borrowed at the SLF had helped contain late-day rate pressures.

In financing markets, the Desk's hefty intake of collateral likely contributed to downward pressure on RP rates for all collateral classes relative to the federal funds rate in the mornings immediately surrounding the year-end (Chart 21). On the year-end itself, when private sector demands for and Desk holdings of Treasury collateral were particularly heightened, spreads on mortgage-backed and agency RP rates over Treasury RP rates were wider than they had been on previous year-ends. But apart from that day, no unusual spreads between financing rates for mortgage-backed, agency, and Treasury collateral ever developed in the period around the CDC. In the absence of extremely firm financing rate or funds rate pressures developing around year-end, none of the options that the Desk sold were exercised.

APPENDIX A: AUTHORIZATION FOR DOMESTIC OPEN MARKET OPERATIONS

Open market operations during 1999 were conducted under the Authorization for Domestic Open Market Operations. Several amendments were made to the Authorization in August 1999, some of a temporary nature, which are described in Section I.C of the text. In February, the Committee amended the paragraph relating to the Treasury securities lending program, introducing the auction technique for awarding borrowed securities to dealer firms on a competitive basis. The Authorization for Domestic Open Market Operations in effect at the end of 1999 is reprinted below:

Authorization for Domestic Open Market Operations

1. The Federal Open Market Committee authorizes and directs the Federal Reserve Bank of New York, to the extent necessary to carry out the most recent domestic policy directive adopted at a meeting of the Committee:

    (a) To buy or sell U.S. Government securities, including securities of the Federal Financing Bank, and securities that are direct obligations of, or fully guaranteed as to principal and interest by, any agency of the United States in the open market, from or to securities dealers and foreign and international accounts maintained at the Federal Reserve Bank of New York, on a cash, regular, or deferred delivery basis, for the System Open Market Account at market prices, and, for such Account, to exchange maturing U.S. Government and Federal agency securities with the Treasury or the individual agencies or to allow them to mature without replacement; provided that the aggregate amount of U.S. Government and Federal agency securities held in such Account (including forward commitments) at the close of business on the day of a meeting of the Committee at which action is taken with respect to a domestic policy directive shall not be increased or decreased by more than $12.0 billion during the period commencing with the opening of business on the day following such meeting and ending with the close of business on the day of the next such meeting;

    (b) To buy U.S. Government securities, obligations that are direct obligations of, or fully guaranteed as to principal and interest by, any agency of the United States, from dealers for the account of the Federal Reserve Bank of New York under agreements for repurchase of such securities or obligations in 90 calendar days or less, at rates that, unless otherwise expressly authorized by the Committee, shall be determined by competitive bidding, after applying reasonable limitations on the volume of agreements with individual dealers; provided that in the event Government securities or agency issues covered by any such agreement are not repurchased by the dealer pursuant to the agreement or a renewal thereof, they shall be sold in the market or transferred to the System Open Market Account.

    (c) To sell U.S. Government securities that are direct obligations of, or fully guaranteed as to principal and interest by, any agency of the United States to dealers for System Open Market Account under agreements for the resale by dealers of such securities or obligations in 90 calendar days or less, at rates that, unless otherwise expressly authorized by the Committee, shall be determined by competitive bidding, after applying reasonable limitations on the volume of agreements with individuals dealers.

2. In order to ensure the effective conduct of open market operations, the Federal Open Market Committee authorizes the Federal Reserve Bank of New York to lend on an overnight basis U.S. Government securities held in the System Open Market Account to dealers at rates that shall be determined by competitive bidding but that in no event shall be less than 1.0 percent per annum of the market value of the securities lent. The Federal Reserve Bank of New York shall apply reasonable limitations on the total amount of a specific issue that may be auctioned and on the amount of securities that each dealer may borrow. The Federal Reserve Bank of New York may reject bids which could facilitate a dealer's ability to control a single issue as determined solely by the Federal Reserve Bank of New York.

3. In order to ensure the effective conduct of open market operations, while assisting in the provision of short-term investments for foreign and international accounts maintained at the Federal Reserve Bank of New York, the Federal Open Market Committee authorizes and directs the Federal Reserve Bank of New York (a) for System Open Market Account, to sell U.S. Government securities to such foreign and international accounts on the bases set forth in paragraph l(a) under agreements providing for the resale by such accounts of those securities within 90 calendar days on terms comparable to those available on such transactions in the market; and (b) for New York Bank account, when appropriate, to undertake with dealers, subject to the conditions imposed on purchases and sales of securities in paragraph 1(b), repurchase agreements in U.S. Government and agency securities, and to arrange corresponding sale and repurchase agreements between its own account and foreign and international accounts maintained at the Bank. Transactions undertaken with such accounts under the provisions of this paragraph may provide for a service fee when appropriate.

4. In order to help ensure the effective conduct of open market operations during the transition period surrounding the century date change, the Committee authorizes the Federal Reserve bank of New York to sell options on repurchase agreements, reverse repurchase agreements, and matched sale purchase transactions for exercise no later than January 2000.

APPENDIX B

Operations in United States Government Securities and Federal Agency Securities

(Settlement date basis, in thousands)

For the year ended December 31, 1999

	Purchases	Sales	Redemptions	Exchanges	Net Changes	Holdings 12/31/1999	Holdings 12/31/1998
System Open Market Account							
Government Securities							
Treasury Bills							
				(464,217,776)			
Outright	-	-	-	464,217,776	-	215,699,444	215,699,444
Matched Trans.	4,395,997,838	(4,414,252,771)	-	-	(18,254,933)	(39,182,043)	(20,927,110)
Total Bills	4,395,997,838	(4,414,252,771)	-	-	(18,254,933)	176,517,401	194,772,334
Treas. Notes & Bonds							
Maturing:							
Within 1 year	11,895,300	-	(1,429,160)	(53,314,799)	(42,848,659) #	59,899,148	49,148,359
1 to 5 years	19,754,214 @	-	-	42,603,799	62,358,013 #	124,169,064	107,729,521
5 to 10 years	4,385,373 @	-	-	7,582,935	11,968,308 #	51,106,652	44,822,174
Over 10 years	9,460,334 @	-	-	3,138,568	12,598,902 #	66,270,245	55,668,491
Total Notes and Bonds	45,495,221	-	(1,429,160)	10,503	44,076,564	301,445,109	257,368,545
Total Gov't secs.							
Incl. Matched Trans.	4,441,493,059	(4,414,252,771)	(1,429,160)	10,503	25,821,631	477,962,510	452,140,879
(Excl. Matched Trans.)	45,495,221	-	(1,429,160)	10,503	44,076,564	517,144,553	473,067,989
Federal Agency Issues							
Maturing:							
Within 1 year	-	-	(156,550)	-	(156,550) &	51,000	101,900
1 to 5 years	-	-	-	-	- &	10,000	61,000
5 to 10 years	-	-	-	-	- &	120,000	174,650
Over 10 years	-	-	-	-	- &	-	-
Total Agency	-	-	(156,550)	-	(156,550)	181,000	337,550
Total System Account							
Incl. Matched Trans.	4,441,493,059	(4,414,252,771)	(1,585,710)	10,503	25,665,081	478,143,510	452,478,429
(Excl. Matched Trans.)	45,495,221	-	(1,585,710)	10,503	43,920,014	517,325,553	473,405,539
F.R.B. of New York							
Repurchase Agreements	946,657,000	(836,393,000)	-	-	110,264,000	140,640,000	30,376,000

Note: There were no customer related RP's passed though to the market for the year ended 12/31/1999.
12/31/99 and 12/31/98 Repurchase Agreements are shown at cash value and par value, respectively.

APPENDIX B (CONT.)

U.S. TREASURY AND FEDERAL AGENCY SECURITY HOLDINGS
IN SYSTEM OPEN MARKET ACCOUNT
(Statement date basis, in thousands)

	Holdings 12/31/1999	% of Total Outstanding
Treasury Bills		
Issues outstanding		
01/06/2000 #	$924,320	2.3%
01/13/2000 #	3,001,860	4.7%
01/20/2000 #	3,055,500	7.5%
01/27/2000 #	3,047,815	11.8%
02/03/2000 #	3,093,010	7.3%
02/10/2000 #	7,102,442	26.4%
02/17/2000	8,231,564	32.2%
02/24/2000	7,998,180	32.6%
03/02/2000	13,184,955	32.6%
03/09/2000	8,186,780	32.5%
03/16/2000	7,609,310	31.6%
03/23/2000	7,144,235	29.7%
03/30/2000	12,532,430	31.5%
04/06/2000	3,530,000	14.4%
04/13/2000	3,960,000	33.1%
04/20/2000	3,565,000	29.2%
04/27/2000	7,935,000	30.4%
05/04/2000	3,960,000	30.3%
05/11/2000	3,635,000	31.2%
05/18/2000	3,800,000	31.8%
05/25/2000	8,780,000	32.6%
06/01/2000	3,870,000	31.3%
06/08/2000	3,850,000	32.5%
06/15/2000	3,690,000	31.5%
06/22/2000	7,735,000	29.7%
06/29/2000	3,670,000	31.4%
07/20/2000	4,940,000	32.1%
08/17/2000	5,010,000	33.3%
09/14/2000	5,170,000	33.3%
10/12/2000	4,950,000	29.6%
11/09/2000	4,540,000	29.4%
12/07/2000	4,815,000	32.5%
Total Treasury Bills	$176,517,401 #	
	176,517,401	
Treasury Bonds		
Issues outstanding		
11.750 02/15/2001	$165,803	11.0%
13.125 05/15/2001	220,926	12.6%
13.375 08/15/2001	256,092	14.6%
15.750 11/15/2001	227,904	13.0%
14.250 02/15/2002	199,800	11.4%
11.625 11/15/2002	347,850	12.6%
10.750 02/15/2003	739,250	24.6%

		Holdings 12/31/1999	% of Total Outstanding
Treasury Bonds (Cont'd)			
Issues outstanding			
10.750	05/15/2003	$433,300	13.3%
11.125	08/15/2003	514,300	14.7%
11.875	11/15/2003	1,034,340	14.2%
12.375	05/15/2004	769,786	20.5%
13.750	08/15/2004	528,000	13.2%
11.625	11/15/2004	1,184,600	14.3%
8.250	05/15/2005	1,513,660	35.8%
12.000	05/15/2005	728,476	17.1%
10.750	08/15/2005	1,323,000	14.3%
9.375	02/15/2006	372,000	7.8%
7.625	02/15/2007	1,396,164	33.0%
7.875	11/15/2007	378,500	25.3%
8.375	08/15/2008	788,500	37.5%
8.750	11/15/2008	1,588,500	30.4%
9.125	05/15/2009	921,205	20.0%
10.375	11/15/2009	1,075,939	25.6%
11.750	02/15/2010	717,400	28.8%
10.000	05/15/2010	1,176,556	39.4%
12.750	11/15/2010	1,260,865	26.6%
13.875	05/15/2011	1,073,542	23.3%
14.000	11/15/2011	975,091	19.9%
10.375	11/15/2012	1,611,741	14.6%
12.000	08/15/2013	3,040,772	20.6%
13.250	05/15/2014	869,450	17.4%
12.500	08/15/2014	905,720	17.7%
11.750	11/15/2014	1,195,000	19.9%
11.250	02/15/2015	1,655,733	13.1%
10.625	08/15/2015	1,167,400	16.3%
9.875	11/15/2015	941,500	13.6%
9.250	02/15/2016	1,037,000	14.3%
7.250	05/15/2016	1,098,000	5.8%
7.500	11/15/2016	1,378,000	7.3%
8.750	05/15/2017	2,517,000	13.8%
8.875	08/15/2017	1,954,000	13.9%
9.125	05/15/2018	1,230,900	14.1%
9.000	11/15/2018	539,000	6.0%
8.875	02/15/2019	1,685,000	8.8%
8.125	08/15/2019	1,840,900	9.1%
8.500	02/15/2020	1,360,879	13.3%
8.750	05/15/2020	1,393,600	13.7%
8.750	08/15/2020	1,527,600	13.9%
7.875	02/15/2021	840,500	7.6%
8.125	05/15/2021	1,315,000	11.0%
8.125	08/15/2021	1,560,000	12.8%
8.000	11/15/2021	2,714,000	8.3%
7.250	08/15/2022	846,000	8.2%

- Holdings were reduced by $12,000,000 of January 6 T/Bills, $5,700,000 of January 13 T/Bills, $4,500,000 of January 20 T/Bills, $4,800,000 of January 27 T/Bills, $10,900,000 of February 3 T/Bills and $1,282,043 of February 10 T/Bills that were sold under matched sale-purchase agreements which are generally overnight arrangements.

APPENDIX B (CONT.)

U.S. TREASURY AND FEDERAL AGENCY SECURITY HOLDINGS
IN SYSTEM OPEN MARKET ACCOUNT
(Statement date basis, in thousands)

		Holdings 12/31/1999	% of Total Outstanding
Treasury Bonds (Cont'd)			
Issues outstanding			
7.625	11/15/2022	$1,521,000	14.2%
7.125	02/15/2023	2,292,000	12.5%
6.250	08/15/2023	1,487,000	6.5%
7.500	11/15/2024	1,346,000	11.7%
7.625	02/15/2025	1,146,000	9.8%
6.875	08/15/2025	1,697,000	13.5%
6.000	02/15/2026	1,009,000	7.8%
6.750	08/15/2026	1,425,000	13.1%
6.500	11/15/2026	1,555,000	13.6%
6.625	02/15/2027	610,000	5.8%
6.375	08/15/2027	1,265,000	11.8%
6.125	11/15/2027	2,770,000	12.3%
5.500	08/15/2028	1,771,808	15.0%
5.250	11/15/2028	945,000	8.6%
5.250	02/15/2029	1,340,000	11.8%
6.125	08/15/2029	1,075,000	9.6%
Total Treasury Bonds		$81,390,852	
Treasury Notes			
Issues outstanding			
6.375	01/15/2000	$705,545	7.0%
5.375	01/31/2000	2,281,230	13.1%
7.750	01/31/2000	1,763,440	14.6%
5.875	02/15/2000	2,165,796	10.6%
8.500	02/15/2000	1,304,000	12.2%
5.500	02/29/2000	1,555,320	8.8%
7.125	02/29/2000	1,663,290	13.4%
5.500	03/31/2000	2,098,220	12.2%
6.875	03/31/2000	1,416,510	10.8%
5.500	04/15/2000	568,000	5.4%
5.625	04/30/2000	2,149,000	13.8%
6.750	04/30/2000	1,720,250	13.9%
6.375	05/15/2000	2,927,000	14.1%
8.875	05/15/2000	486,000	4.6%
5.500	05/31/2000	2,224,000	13.5%
6.250	05/31/2000	1,613,560	12.7%
5.375	06/30/2000	1,538,000	10.3%
5.875	06/30/2000	1,570,900	12.6%
5.375	07/31/2000	2,655,750	14.2%
6.125	07/31/2000	1,044,200	8.5%
6.000	08/15/2000	2,524,245	14.0%

		Holdings 12/31/1999	% of Total Outstanding
Treasury Notes (Cont'd)			
Issues outstanding			
8.750	08/15/2000	$1,538,400	13.9%
5.125	08/31/2000	2,994,300	15.0%
6.250	08/31/2000	1,226,000	10.3%
4.500	09/30/2000	2,241,500	11.6%
6.125	09/30/2000	1,033,500	8.6%
4.000	10/31/2000	2,939,900	14.3%
5.750	10/31/2000	935,430	7.8%
5.750	11/15/2000	2,182,200	13.6%
8.500	11/15/2000	1,032,300	9.0%
4.625	11/30/2000	2,600,500	12.9%
5.625	11/30/2000	1,265,200	10.2%
4.625	12/31/2000	2,779,662	14.3%
5.500	12/31/2000	1,156,000	9.0%
4.500	01/31/2001	2,765,000	14.0%
5.250	01/31/2001	801,000	6.3%
5.375	02/15/2001	1,652,560	10.8%
7.750	02/15/2001	1,208,500	10.7%
5.000	02/28/2001	2,646,000	13.5%
5.625	02/28/2001	1,204,000	9.4%
4.875	03/31/2001	3,385,000	15.7%
6.375	03/31/2001	1,649,000	11.6%
5.000	04/30/2001	3,019,620	14.4%
6.250	04/30/2001	1,410,500	10.3%
5.625	05/15/2001	2,270,117	17.7%
8.000	05/15/2001	1,683,000	13.6%
5.250	05/31/2001	3,055,890	15.4%
6.500	05/31/2001	1,402,900	10.2%
5.750	06/30/2001	2,629,255	13.8%
6.625	06/30/2001	2,043,000	14.3%
5.500	07/31/2001	3,560,370	17.4%
6.625	07/31/2001	1,592,000	11.3%
7.875	08/15/2001	1,754,400	14.3%
5.500	08/31/2001	3,256,110	16.2%
6.500	08/31/2001	1,226,300	8.8%
5.625	09/30/2001	2,125,132	11.3%
6.375	09/30/2001	1,483,100	10.2%
5.875	10/31/2001	2,681,615	14.0%
6.250	10/31/2001	975,000	6.7%
7.500	11/15/2001	3,469,000	14.3%
5.875	11/30/2001	3,872,320	11.6%
6.125	12/31/2001	4,141,445	13.3%
6.250	01/31/2002	1,259,800	9.4%
6.250	02/28/2002	1,354,400	9.8%
6.625	03/31/2002	1,770,800	12.4%
6.625	04/30/2002	1,976,800	13.7%
7.500	05/15/2002	1,653,509	14.1%

APPENDIX B (CONT.)

U.S. TREASURY AND FEDERAL AGENCY SECURITY HOLDINGS
IN SYSTEM OPEN MARKET ACCOUNT
(Statement date basis, in thousands)

	Holdings 12/31/1999	% of Total Outstanding
Treasury Notes (Cont'd)		
Issues outstanding		
6.500 05/31/2002	$1,634,000	12.1%
6.250 06/30/2002	1,319,000	10.1%
6.000 07/31/2002	782,000	6.4%
6.375 08/15/2002	3,369,000	14.1%
6.250 08/31/2002	1,072,000	8.4%
5.875 09/30/2002	735,000	5.7%
5.750 10/31/2002	840,500	7.2%
5.750 11/30/2002	1,335,000	11.0%
5.625 12/31/2002	928,000	7.7%
5.500 01/31/2003	1,118,000	8.5%
6.250 02/15/2003	2,564,000	10.9%
5.500 02/28/2003	1,802,000	13.2%
5.500 03/31/2003	1,522,000	10.7%
5.750 04/30/2003	1,793,000	14.3%
5.500 05/31/2003	1,350,000	10.3%
5.375 06/30/2003	1,309,000	10.0%
5.250 08/15/2003	2,834,000	14.3%
5.750 08/15/2003	3,820,000	13.6%
4.250 11/15/2003	1,518,385	8.2%
4.750 02/15/2004	2,012,740	11.3%
5.875 02/15/2004	650,000	5.0%
5.250 05/15/2004	2,561,624	13.5%
7.250 05/15/2004	2,045,550	14.2%
6.000 08/15/2004	1,616,710	8.9%
7.250 08/15/2004	875,000	6.6%
5.875 11/15/2004	2,189,968	11.9%
7.875 11/15/2004	2,028,040	14.2%
7.500 02/15/2005	1,476,600	10.7%
6.500 05/15/2005	2,000,000	13.6%
6.500 08/15/2005	2,015,000	13.4%
5.875 11/15/2005	1,960,000	12.9%
5.625 02/15/2006	1,918,000	12.4%
6.875 05/15/2006	2,075,000	13.0%
7.000 07/15/2006	3,241,752	14.3%
6.500 10/15/2006	3,055,800	13.6%
6.250 02/15/2007	1,051,000	8.0%
6.625 05/15/2007	1,953,000	14.0%
6.125 08/15/2007	3,654,000	14.3%
5.500 02/15/2008	1,420,000	10.5%
5.625 05/15/2008	4,084,000	15.0%
4.750 11/15/2008	2,475,000	9.9%
5.500 05/15/2009	2,045,000	13.8%
6.000 08/15/2009	3,425,000	12.5%
Total Treasury Notes	$214,350,260	

	Holdings 12/31/1999	% of Total Outstanding
Treasury inflation Index Bonds (IIB)		
Issues outstanding		
3.625 04/15/2028	$820,000	4.9%
3.875 04/15/2029	718,000	4.9%
Total Treasury IIB	$1,538,000 @	
Treasury inflation Index Notes (IIN)		
Issues outstanding		
3.625 07/15/2002	$900,000	5.4%
3.375 01/15/2007	1,010,000	6.4%
3.625 01/15/2008	1,260,000	7.5%
3.875 01/15/2009	768,000	4.8%
Total Treasury IIN	$3,938,000 @	
Total Treasury Bonds, IIN, IIB and Notes	$301,217,112 @	
FNMA SMS		
Issues outstanding		
6.100 02/10/2000	$25,000	5.0%
9.050 04/10/2000	10,000	1.3%
9.200 09/11/2000	10,000	2.5%
5.800 12/10/2003	10,000	1.3%
6.850 09/12/2005	20,000	5.0%
6.700 11/10/2005	100,000	25.0%
Total FNMA SMS	$175,000	
FHLBB LTDS		
Issues outstanding		
8.600 01/25/2000	$6,000	2.0%
Total FHLBB LTDS	$6,000	
Total Agency Issues	$181,000	
Total Treasury & Agency Issues	$477,915,513 @	

@ Does not reflect inflation compensation of $227,997.