DOMESTIC OPEN MARKET OPERATIONS DURING 2000

February 2001

OPEN MARKET OPERATIONS DURING 2000 FEDERAL RESERVE BANK OF NEW YORK, MARKETS GROUP

I.	IMPLI	EMENTATION OF MONETARY POLICY IN 2000	page
	A.	Directives of the Federal Open Market Committee	1
	В. С.	Overview of Operating Procedures and Practices to Influence the Federal Funds Rate New Developments in 2000	1 2
II.	FACT RESEI	ORS AFFECTING REQUIRED DEMANDS FOR AND THE SUPPLY OF FEDEI RVE BALANCES	RAL
	A.	Total Required Demands for Federal Reserve Balances	4
	В.	Autonomous Factors Affecting the Supply of Federal Reserve Balances	7
III.	SUMM	IARY OF OPEN MARKET OPERATIONS IN 2000	
	A.	Permanent Activity Affecting the System Open Market Account	10
	В.	Temporary Open Market Operations	14
IV.	EXCE	SS RESERVE BALANCES AND THE FEDERAL FUNDS RATE	
	A.	Excess Reserve Balances in 2000	19
	В.	Federal Funds Rate Behavior in 2000	19
APPE	NDIX A:	AUTHORIZATION FOR DOMESTIC OPEN MARKET OPERATIONS	26
APPE AGEN	NDIX B: CY ISSU	GUIDELINES FOR THE CONDUCT OF SYSTEM OPERATIONS IN FEDERAL ES	28
APPE	NDIX C:	OPERATIONS IN GOVERNMENT AND FEDERAL AGENCY SECURITIES	29

DOMESTIC OPEN MARKET OPERATIONS DURING 2000

I. IMPLEMENTATION OF MONETARY POLICY IN 2000

A. Directives of the Federal Open Market Committee

In 2000, 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 the market for reserves consistent with maintaining the federal funds rate at an average around a specified rate. This indicated rate is commonly referred to as the federal funds rate target. The FOMC raised the federal funds target by 1 percentage point in three steps over the year to a level of 6 ¹/₂ percent (Table 1). Each rate change was decided at a scheduled meeting. On each of these three occasions, the Board of Governors approved an equal sized increase in the discount rate.

The FOMC implemented modifications to its disclosure procedures at its February meeting.¹ These new procedures included the adoption of new language to describe the Committee's judgment about the economic outlook and were designed to enhance communication to the public, but they had no implications for the conduct of monetary operations between meetings.

	Expected Federal	
Date of Change	Funds Rate (Percent)	Discount Rate (Percent)
11/16/99	5 1/2	5
2/2/00	5 3/4	5 1/4
3/21/00	6	5 1/2
5/16/00	6 1/2	6

 Table 1

 Changes in the Federal Funds Rate Specified in the FOMC Directive

B. Overview of Operating Procedures and Practices to Influence the Federal Funds Rate

The Desk uses open market operations to align the supply of balances held by depository institutions at the Federal Reserve—or Fed balances—with the demand for holding balances. The average level of balances banks demand over two-week reserve maintenance periods is in large measure determined by their reserve balance and clearing balance requirements, with only a relatively small level of additional, or excess,

¹ A description of the changes in disclosure procedures can be found at the following URL address: <u>www.federalreserve.gov/boarddocs/press/General/2000/20000119</u>. The FOMC adopted these modifications at its December 1999 meeting.

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 Manager of the System Open Market Account. Spence Hilton was primarily responsible for the preparation of this report, with the assistance of many others in the Markets Group.

balances typically demanded.² The ability of depository institutions to average their holdings of balances at the Fed over two-week periods to meet their requirements gives them flexibility in managing their accounts from day to day, which helps limit 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, and the rate will soften if balances are so high that some banks risk ending a period holding unusable excess reserve balances.

Each morning, the Desk considers whether open market operations are needed based on estimates of the supply of and demand for balances, taking account of possible forecast errors and minimal levels of aggregate Fed balances that in practice are needed to facilitate settlement of wholesale financial payments by banks. Any operation designed to alter balances that same day is typically arranged shortly afterwards. When the funds rate is near target, the Desk aims to supply a level of Fed balances that equilibrates the expected cost banks associate with borrowing at the discount window to avoid ending a day overdrawn in their Fed account (or finishing a period short of their requirements) with the expected cost of holding unusable excess balances. When the funds rate deviates from the target, the Desk adjusts the level of Fed balances it aims to supply in the appropriate direction.

C. New Developments in 2000

Two institutional initiatives adopted in 1999 to facilitate the conduct of monetary operations around the century date change (CDC) were allowed to lapse, and the FOMC extended two provisions that it had originally scheduled to expire on April 30, 2000. The FOMC's Authorization for Domestic Open Market Operations in place at the end of the year, which embodies some of these changes, is re-printed in Appendix A.

- The Century Date Change Special Liquidity Facility (SLF) established by the Federal Reserve Board for lending to depository institutions from October 1, 1999 through April 7, 2000 ended its operations as scheduled. There were no instances of SLF borrowing by large institutions after January 6, although small institutions continued to use the facility.
- The FOMC's temporary authority for the Desk to sell options on repurchase agreements, reverse repurchase agreements, and matched sale-purchase transactions for exercise no later than January 2000 expired.

² Levels of excess balances demanded do not appear to be very sensitive to the level of total requirements, which change from period to period. For this reason, Desk operations are usually formulated to attain certain objectives for the level of excess balances rather than for a particular level of total balances.

- At its March meeting, the Committee made permanent the Desk's authority to use reverse repurchase agreements in addition to matched sale-purchase transactions to absorb reserves on a temporary basis. The Desk has not yet arranged any reverse repurchase agreements, and their regular use is not expected until the Desk's new trading system becomes operational.
- At that same meeting, the FOMC also extended temporarily through its first regularly scheduled meeting in 2001 its authorization for an expanded pool of collateral to be accepted on the Desk's System repurchase transactions. The principal effect was to continue the inclusion of pass-through mortgage securities of the Government National Mortgage Association, Freddie Mac, and Fannie Mae, and of stripped securities of government agencies. This extension was made in light of anticipated paydowns of marketable federal debt associated with projected budget surpluses that were likely to limit the System's ability in the future to continue to add substantially to holdings, even on a temporary basis, without generating undesirable market repercussions. To implement this decision, the FOMC voted to extend temporarily its suspension of several provisions of its "Guidelines for the Conduct of System Operations in Federal Agency Issues," which impose restrictions on transactions in federal agency securities (Appendix B). At the same meeting, the FOMC endorsed a proposal to undertake a broad-gauge study to consider alternative asset classes and selection criteria that could be appropriate for the System Open Market Account (SOMA), with particular attention to alternatives to the historical reliance on net additions to outright holdings of Treasury securities as the sole means of effectuating the upward trend in the asset side of the System's balance sheet.

On July 5, the Desk announced several changes to how it manages the System's portfolio of Treasury securities.³ The changes are intended to help it achieve its objectives for a relatively short and liquid portfolio without distorting the yield curve or impairing the liquidity of the market amid recent and anticipated changes in the quantity and composition of marketable Treasury securities. The Desk had already begun to cap System holdings of Treasury bills at 35 percent of any given issue, both in terms of what would be rolled over at each auction and in terms of acquisitions in the secondary market. It announced that it would also cap SOMA holdings of Treasury coupon issues in a similar manner on a graduated scale from 25 percent for two-year notes down to 15 percent for securities with maturities of ten years or more. It also affirmed its policy of limiting SOMA holdings of newly-issued securities, as it has no particular portfolio need for the some of the liquidity characteristics that can add to the value of these issues in the market. These procedures are expected to remain in place while the Federal Reserve undertakes its review of alternatives for open market operations. The public announcement of these changes was intended to help market participants to anticipate Desk operations in the face of changes in the

³ A detailed description of these changes and their motivation can be found at the following URL address: <u>www.ny.frb.org/pihome/news/announce/2000/an000705.html</u>. These changes were developed with the approval of the FOMC and in consultation with the Department of the Treasury.

quantity and composition of outstanding Treasury debt. These changes in the management of the SOMA had profound implications for the structure of monetary operations in 2000—redemptions at auctions, outright purchases in the secondary market and from foreign accounts, and indirectly even temporary operations—which are described in Section III. In a related step, each Thursday afternoon the FRBNY began to publish on its website the complete details of the SOMA's holdings as of the close of business each Wednesday.⁴

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

A. Total Required Demands for Federal Reserve Balances

The need for the Desk to create or extinguish reserve balances through use of open market operations is heavily influenced by the levels of Fed balances that depository institutions are required to hold each two-week maintenance period relative to the supply of balances forthcoming from autonomous factors outside the Desk's control. Total required balances are the Fed balances that banks are required by the Federal Reserve to hold, on average, within a two-week maintenance period. Total required balances are calculated as required reserves minus applied vault cash plus required clearing balances. As-of accounting adjustments also affect the level of balances banks must hold to meet their requirements, so the Desk subtracts their value when calculating the true level of Fed balances that banks are required to hold in a maintenance period.⁵ Excess reserve balances can be measured as the difference between the aggregate supply of balances at the Fed and total required balances.⁶

Early in 2000, total required balances rebounded from the depressed levels around the century date change, then were fairly steady over the year after having been on a declining trend through much of the second half of the 1990s (Chart 1). Movements in total required balances in recent years have largely paralleled changes in the level of required reserve balances—required reserves less applied vault cash—as required clearing balances and average levels of as-of adjustments have been trendless.

⁴ This information is found at the following URL address: <u>www.ny.frb.org/pihome/statistics/soma.shtml</u>.

⁵ Required clearing balances and, under lagged reserve accounting rules in effect since August 1998, the levels of required reserves and applied vault cash are determined prior to the start of each maintenance period, which facilitates estimation of the demand for Fed balances. But as-of adjustments are not all known when a period starts. When large as-of adjustments are applied or reported to the Desk only very late in a period, it affords the Desk little or no opportunity to adjust its operations.

⁶ In this report, required clearing balances, applied vault cash, and as-of adjustments are presented as factors that affect banks' demands for Fed balances. In published reserves data, applied vault cash and as-of adjustments are treated as sources of supply of nonborrowed reserves, and required clearing balances are treated as a negative source of nonborrowed reserves.







The huge buildup in the level of total vault cash ahead of the CDC caused many banks to become "nonbound," that is, to meet their reserve requirements entirely with vault cash, and much of the vault cash held during this time was at nonbound institutions (Chart 2).⁷ Still, a portion of the CDC-related increase in total vault cash was useful for meeting reserve requirements, which both increased modestly the level of applied vault cash temporarily and caused required reserve balances to dip briefly. By the end of February 2000, these CDC-related effects on the levels of vault cash and required reserve balances had largely unwound.

Declines in required reserve balances over the past five years have largely been the result of programs by depository institutions to "sweep" reservable liabilities into nonreservable liabilities, which resulted in a significant decrease in required reserves. Sweep programs during 2000 expanded about as much as they did the preceding year, but by much less than when their growth was fastest in the middle of the 1990s.⁸

⁷ The values for total vault cash in Chart 2 are those associated with the level of applied vault cash in the indicated maintenance period. Thus, these vault cash levels are the lagged quantities held in vaults of all depository institutions in the computation period that preceded the indicated maintenance period by 30 days.

⁸ In the twelve months ending in December 2000, the estimated amount of deposits initially swept by banks expanded by \$44 billion. The increase over the preceding twelve month period was \$50 billion. Sweeps expanded by \$116 billion over the twelve months ending December 1996, the largest change over any calendar year.



Much of the decline in the level of required reserves that took place in 2000 apparently occurred at nonbound institutions because it was matched by a similar decline in applied vault cash, leaving the level of required reserve balances fairly flat over the year once past the CDC period (Chart 3). As the number of banks that are nonbound has grown, movements in required reserves and applied vault cash from one period to the next have become increasingly correlated.

B. Autonomous Factors Affecting the Supply of Federal Reserve Balances

The levels of three factors—currency in circulation, the Treasury's balance at the Fed, and the foreign RP pool—that increased dramatically in advance of the CDC, reducing supplies of Fed balances, quickly reversed themselves early in 2000 (Chart 4). Thereafter, factor movements over the year had a relatively small net impact on balances, until late in the year. Year-end levels of factors, and total SOMA holdings and outstanding RPs, appear in Table 2.

Changes in Currency in Circulation

After reaching its peak level on a period average basis in early January, currency in circulation declined abruptly by \$46 billion over the following two maintenance periods. Most of the CDC run-off appears to have been completed by mid-February, although currency continued to fall slightly for a few more periods.

 Table 2

 Contributions of Autonomous Factors, SOMA Holdings, and RPs to Federal Reserve Balances

(billions of dollars; sign reflects impact on supply of Fed balances)

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	Daily I	Levels	Average L	evels for Periods	Ending:
	<u>Year-end 1999</u>	<u>Year-end 2000</u>	Dec. 30, 1998	<u>Dec 29, 1999</u>	<u>Dec 27, 2000</u>
Key factors					
adding to balances					
Float	0.4	0.8	2.5	0.7	2.0
SDRs	6.2	2.2	9.2	6.2	2.3
Foreign Currency	14.4	15.4	17.4	14.4	15.4
Key factors					
draining balances					
Currency in Circulation	-628.4	-593.3	-514.1	-610.9	-586.1
Treasury Balance	-28.4	-5.1	-6.3	-9.2	-6.2
Foreign RP Pool	-39.2	-21.1	-19.4	-24.2	-17.0
Net Impact of All Factors	<u>-634.2</u>	<u>-557.4</u>	<u>-472.9</u>	<u>-582.8</u>	<u>-546.9</u>
Total SOMA Holdings	517.3	532.9	473.4	516.3	532.3
Treasury bills	215.7	199.8			
Coupons under 2 years	121.1	142.8			
Coupons $2-5$ years	69.7	72.2			
Coupons $5 - 10$ years	53.1	51.2			
Coupons 10+ years	51.9	59.3			
TIIS	5.7	7.4			
Federal Agency Securiti	es 0.2	0.1			
Long-term RPs (above 14	days) 72.4	23.0	11.1	54.4	22.2
Short-term RPs less MSPs	68.3	20.4	4.1	24.4	6.2
Discount Window Loans	0.2	0.1	0.2	0.4	0.3
Net Impact of all					
Federal Reserve Operation	<u>ns 658.2</u>	<u>576.4</u>	<u>488.8</u>	<u>595.5</u>	<u>560.9</u>
Fed Balances	<u>24.0</u>	<u>19.0</u>	<u>15.9</u>	<u>12.7</u>	<u>14.0</u>
Memo items:					
Total Required Balances	11.7	12.9	14.2	11.4	12.5
Excess Balances	12.3	6.2	1.7	1.3	1.3

Notes: SOMA includes bills sold under MSPs to foreign accounts and in the market. Amounts for SOMA holdings are par values; differences from monetary amounts are captured in other autonomous factors. TIIS amounts include the inflation compensation component.

Apart from any CDC effects, the public's demand for currency appeared to have risen at a much slower pace in 2000 than in recent years. Beginning in April, after most CDC effects appeared to have worn off, he (seasonally adjusted) currency component of M1, which excludes vault cash, rose at a pace of about 3 percent—consistent with an annual increase of about \$15 billion in the level of currency (Chart 5). This



pace was well below the 7 ¹/₂ percent average rate of growth of M1 currency over the five year period preceding 1999. Although the level of currency at the end of 2000 was consistent with pre-CDC growth trajectories extrapolated from the end of 1998, there was no indication that the rate of growth was returning to its previous higher level.

Changes in Other Factors

The Treasury balance and foreign RP pool quickly reversed their CDC-related increases in early January, adding substantially to supply at that time but movements in these factors thereafter had little net impact on balances over the year. The ongoing demonetization of Special Drawing Rights (SDR) certificates, discussed in last year's report, drained \$4 billion from the supply of Fed balances, while holdings of foreign currency rose by about \$1 billion, largely as a consequence a September 22 currency market intervention, adding slightly to balances. On May 10, the transfer of \$3.7 billion of the Fed surplus to the Treasury increased balances by an equivalent amount. The surplus was largely restored in several steps over fourth quarter of the year, however, reversing the original impact on Fed balances.

Volatility and predictability of key factors affecting supply

The volatility of currency, as measured by the average size of absolute daily changes in levels, was generally close to (and even a bit higher than) the elevated level of 1999 (Table 3). But excluding January, the average daily changes were much lower, and about the same as in 1998. In general, volatility of key

factors from February through December was on a par with 1998, prior to any CDC influences. Average daily forecast misses for most key factors have been fairly steady for the past two years and did not appear to have been significantly higher around the CDC period, although foreign RP pool projections have shown some improvement.

Table 3

Daily Changes and Forecast Misses in Key Determinants of Reserve Balance Supply Average and Maximum of Absolute Values (millions of dollars)

	1998		1999		2000		Feb. – Dec. 2000		
	average	max.	average	max.	average	max.	average	max.	
Daily Change									
Currency in circulation	709	2,788	893	5,379	931	8,087	760	2,628	
Treasury balance	1,413	22,571	887	7,446	1,404	23,434	1,272	23,434	
Foreign RP Pool	500	6,193	572	6,049	467	4,015	418	3,255	
Float	791	5,449	693	6,217	839	9,677	790	5,824	
Net value	1,751	23,727	1,925	17,628	2,006	23,896	1,671	23,896	
Daily Forecast Miss									
Currency in circulation	217	999	234	1,361	229	1,648	222	1,277	
Treasury balance	620	3,407	608	3,284	617	6,866	602	6,866	
Foreign RP Pool	150	935	224	1,817	131	976	128	976	
Float	383	2,386	393	4,274	382	2,742	368	1,854	
Net value	744	3,664	818	5,443	787	7,218	760	7,218	

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.

III. SUMMARY OF OPEN MARKET OPERATIONS IN 2000

The changes in the management of the System Open Market Account announced in July had a profound effect on the structure of open market operations in 2000, although they did not influence the levels of Fed balances the Desk aimed to supply on any particular day. These changes significantly influenced the mix of redemptions, outright purchases, long-term RPs, and short-term temporary operations employed by the Desk.

A. Permanent Activity Affecting the System Open Market Account

Net Expansion of the SOMA

In 2000, the portfolio of domestic securities in the SOMA expanded by \$15.6 billion, the smallest increase since 1996, to end the year at \$532.9 billion (Chart 6).⁹ As in past years, the Desk sought to meet long-run reserve needs to the extent possible through net growth of the SOMA. However, over the past three years, the net drain to Fed balances arising from changes in autonomous factors has slightly outpaced the growth in the SOMA as the Desk has come to use long-term RPs to meet a portion of permanent needs. The

⁹ Unless otherwise indicated, changes and levels of the SOMA include the inflation compensation component of inflation-indexed securities, which at the end of the year totaled about \$500 million, and federal agency security holdings. All figures are par values.



expansion of the SOMA in 2000 was not constrained by the decline in outstanding Treasury debt or by the changes in the management of the SOMA adopted in July. The timing of the net expansion of the SOMA in 2000 coincided less than in many earlier years with the periods of peak seasonal currency growth in early summer and ahead of year-end. A greater portion of the growing reserve deficiencies during these times was met with temporary operations.

Auction Participation and Redemptions

Under its new management procedures, the FRBNY began to place add-on bids for the SOMA at coupon auctions equal to the lesser of (a) the maturing holdings of the issue date of a new security or (b) the amount that would bring SOMA holdings as a percentage of the issue to the percentage guidelines announced in July.¹⁰ Earlier in the year, the Desk began limiting its auction participation in bills.¹¹ Previously, the FRBNY routinely rolled over all maturing holdings into new issues. At auctions of Treasury Inflation Indexed Securities (TIIS), the Desk continued to adhere to its practice of tendering for

¹⁰ Foreign add-ons, which are not known at the time the Desk determines its level of participation at auctions, were assumed to be zero in this calculation.

¹¹At the beginning of 2000 SOMA holdings of bills were capped at 40 percent of any one issue both in terms of what was rolled into at each auction and in terms of acquisitions in the secondary market. This percentage was reduced to 37.5 percent in May and to 35 percent in early June, ahead of the July 5 announcement. The Desk maintained its longstanding practice of allocating new bill holdings acquired at the weekly auctions in proportion to their outstanding amounts.

no more than 5 percent of new issues, though by mid-year there were no maturing issues to exchange for TIIS. On dates when more than one Treasury coupon auction settled, maturing issues were exchanged for newly auction issues so as to equalize the remaining percentages of the total outstanding amounts that were purchasable under the new portfolio guidelines. Previously, the Desk allocated maturing holdings in proportion to the total amounts outstanding of the auctioned issues.

Remaining within the per-issue percentage caps while Treasury cut back on auction sizes forced redemptions of \$28.4 billion of maturing SOMA holdings in 2000 (Chart 7). Given the existing concentration of SOMA holdings in bills and the size of cutbacks in issuance in recent years, redemptions were concentrated in that sector despite the higher per-issue caps (Chart 8). As it has done since mid-1997, the Desk redeemed maturing holdings of federal agency securities, \$51 million altogether, which left \$130 million of agency holdings in the SOMA at the end of the year.

Outright purchases and operational techniques

In total, the Desk bought \$43.6 billion (par value) of securities in 2000, only slightly below the previous year's record purchases, although the resulting net increase in the SOMA was much smaller because of the redemption activity. Purchases were timed in part to prevent redemption activity from significantly reducing supplies of Fed balances. There were no sales of securities.

In recent years, the Desk sought to spread its purchases evenly across the entire range of outstanding marketable coupon securities, while seeking to avoid recently-issued securities by purchasing only those securities for which at least two subsequent auctions had occurred of new issues with similar original maturities. The average maturity of the SOMA's overall holdings tended to increase as the Desk refrained from expanding its holdings of bills because of reductions in bill issuance. In 2000, to prevent the decline in bill holdings that resulted from redemptions from increasing the average maturity of the SOMA's overall holdings even further counter to the FOMC's objectives, the Desk tended to purchase a greater proportion of off-the-run coupon securities with remaining maturities under 2 years than it did of securities with remaining maturities between 10 and 30 years. In doing so, it applied the portfolio guideline percentages announced in July to determine the amounts that the SOMA was ultimately prepared to hold of off-the-run securities in different maturity ranges. Holdings of short-term coupon securities increased the most over the year (Table 2).

The Desk included Treasury bills in its open market purchases for the first time in two years, in response to its revised portfolio guidelines and to staunch some of the decline caused by heavy redemptions in this sector. Three operations totaling \$6.2 billion were restricted to purchases of Treasury bills. In August, the Desk also began to purchase directly from foreign accounts, putting in place procedures allowing it to purchase up to \$250 million for same-day settlement on any given day if orders were available and



Net change in SOMA excludes agency redemptions and TIIS inflation compensation adjustments

Chart 8

Treasury Bills and Coupons: Purchases and Redemptions billions of dollars



Par values. Coupons include TIIS.

consistent with reserve needs. Altogether, it bought \$2.5 billion in Treasury bills from foreign central banks for the SOMA. Still, gross purchases were heavily concentrated in the coupon sector, and bill holdings contracted over the year, in line with the Treasury's general issuance pattern.

The Desk continued to segment its market purchases of nominal Treasury coupon issues into separate tranches across different portions of the yield curve, and it assessed conditions in the market for Treasury securities in timing specific operations. Altogether, it arranged 39 such operations during the year. The average purchase amount on these operations was about \$900 million, very close to the previous year's average size. Two additional operations totaling \$1.1 billion were restricted to all outstanding TIIS.

Characteristics of domestic permanent SOMA holdings at year-end

The portfolio management changes succeeded in ending the recent upward trend in the average maturity of all Treasury issues in the SOMA portfolio. The average maturity of the entire SOMA fell by 1 month, ending the year at about 53 months. The average portfolio maturity had lengthened by 5 months in each of the preceding two years.

The percentage of all outstanding Treasury coupon issues that were held in the SOMA portfolio increased to 14 percent, from 12 percent one year earlier (including TIIS), due primarily to the concentration of the net expansion of the SOMA in that sector. The percentage of total outstanding Treasury bills held in the SOMA portfolio at year-end also rose, to 31 percent, from 29 percent a year earlier, because of even steeper relative declines in total outstanding amounts.

At the end of the year, approximately \$260 billion of marketable Treasury securities remained purchasable under the Desk's guidelines for percentage holdings (Chart 9). In volume, the greatest concentration of purchasable securities was in the short-term sector, with remaining maturities of under 2 years.

B. Temporary Open Market Operations

Use of temporary open market operations

The extraordinarily large levels of RPs built up late in 1999 ahead of the century date change were quickly unwound in January, to coincide with the rapid runoff in Federal Reserve note liabilities (much of this currency never having left banks' vaults) and the return of other autonomous factors to normal levels.

First used on a large scale in 1999 to meet CDC needs, use of long-term RPs, defined here as operations carrying an original maturity of at least 15 days, became fairly routine in 2000.¹² The Desk found long-

¹² While any maturity division between long-term and short-term RPs is 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 are almost always used to address reserve shortages within a single maintenance period.



term RPs to be a useful supplementary tool for meeting underlying reserve needs previously addressed solely through outright activity, either for an indefinite period or as a temporary expedient until permanent adjustments to the SOMA could be made. Adjusting the total size of outstanding long-term RPs was also found to be a convenient way to meet large seasonal reserve swings, and most of the build-up and draw-down in currency around year-end 2000 was addressed in this fashion. Maintenance period average levels of long-term RPs in 2000—after the operations put in place for the CDC had run off—mostly ranged between \$10 and \$15 billion, rising to \$23 billion in the period that straddled year-end 2000 (Chart 10).

The Desk found that it could achieve the desired level of flexibility in the total size of long-term RPs outstanding by arranging an overlapping series of RPs of moderate duration and size. In March, the Desk first began a practice of arranging long-term RPs with 28-day maturities on the Monday and/or Thursday of each week.¹³ After assessing current and future period needs, the Desk would decide whether to adjust the size of a maturing operation, whether to let a maturing operation roll off without replacement, or whether to arrange a new RP on a day when none matured. In practice, operations ranged in size between \$2 billion and \$3 billion. Through this approach, the Desk managed to meet virtually all of the seasonal reserve swing by making marginal adjustments in outstanding long-term RPs.

Chart 9

¹³ Holidays sometimes necessitated a one-day adjustment to the maturity and day of the week an operation was arranged.



Short-term temporary operations were used extensively to offset volatility in factors affecting the supply of Fed balances, to accommodate variability in demands for excess balances within a maintenance period, and to fill temporarily gaps in underlying reserve needs until adjustments could be made to the permanent SOMA or to long-term RPs. Period average levels of outstanding short-term temporary operations (RPs less MSPs) ranged from under \$1 billion to over \$11 billion during the year.¹⁴ Daily levels ranged from -\$4 billion to \$25 billion.¹⁵ In practice, the Desk often structured its outright operations and long-term RPs so that the lowest amount of short-term temporary operations outstanding on any day within a maintenance period would be close to zero.¹⁶

¹⁴ The data in this paragraph are taken from periods starting with the period ended February 23, after operations had adjusted to the runoff of long term RPs arranged around Y2K. The average level of outstanding short-term operations was highest in the period covering the year-end, ending January 10, 2001.

¹⁵ The highest level occurred on April 26. The highest level of total temporary operations outstanding, long-term plus short-term, was \$44 billion, on December 27.

¹⁶ On average, the lowest daily net reserve impact of all outstanding short-term temporary operations within the maintenance periods of 2000 was less than \$1 billion. The average value of the highest daily net reserve impact was \$10 billion across all maintenance periods.



The most commonly chosen maturity on all RPs remained one business day (which includes RPs that also cover a weekend or holiday), of which 137 were arranged in 2000 (Chart 11). This maturity is particularly useful for addressing marginal changes in supply and demand for Fed balances from day to day, and for dealing with the uncertainty inherent in the forecasts. The number of MSPs arranged during the year was again relatively low. Six RPs with forward settlement dates were arranged in 2000, each on the eve of its settlement date. The Desk arranged a small operation on Good Friday, a day dealer staffing is typically quite thin, and found itself somewhat constrained by propositions.

Execution Practices

The Desk's usual practice was to arrange temporary operations at preset times of the day. Longer term RPs were usually arranged at 8:20 a.m., and short-term operations around 9:30 a.m. The Desk always remained prepared to adapt to circumstances and depart from its standard practices as needed. Because of technical limitations associated with the multi-tranche method of executing operations (described in the following subsection), short-term operations with different maturities arranged on the same day were arranged sequentially rather than simultaneously. The Desk would inform the market ahead of time of its intention to arrange a second operation as soon as the selection process for the first operation was complete.

Triparty RPs with the Expanded Pool of Eligible Collateral

On all RPs arranged in 2000 the Desk solicited propositions for the entire expanded pool of eligible collateral temporarily granted by the FOMC. Structurally, all RPs were arranged as three separate,



simultaneous operations, each distinguished by the class of collateral accepted. On one operation, only Treasury collateral could be offered, 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. All RPs arranged in 2000 settled under the triparty arrangements established with two clearing banks in 1999.

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 continued to use the relative rate method adopted last year (and described in last year's annual report). It used market quotes on current RP rates of the relevant term 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.

In general, the proportions of the different collateral types accepted on RPs were very volatile from one operation to the next. But an examination of data taken from the first year over which the expanded collateral pool was used found that the distribution of collateral on accepted propositions and the distribution on total propositions were highly correlated. At the same time, the distribution of total

propositions was correlated with the relative amounts that dealers had yet to finance that morning, taken from the Desk's daily survey of dealer financing needs.¹⁷ These observations suggest that dealers' participation in Desk operations, including the rates they submitted on their propositions, reflected current market conditions.

The period average share of Treasury collateral held against outstanding long-term RPs ranged from about 25 percent to 60 percent (Chart 12). This share tended to be somewhat greater on average for short-term operations, reflecting dealers' preference for financing more of their non-Treasury collateral using longer term operations.

IV. EXCESS RESERVE BALANCES AND THE FEDERAL FUNDS RATE

A. Excess Reserve Balances in 2000

Period-average levels of excess reserve balances in 2000 were similar to levels prevailing in the previous year and in other recent years, indicating that the lower levels to which total required balances have settled have not had a measurable impact on excess needs (Chart 13).¹⁸ There was some decline in average excess levels held by large banks in 2000, small in absolute terms but significant as a proportion of the total, which might partly reflect bank consolidation and improved information processes for managing positions. Volatility in excess levels held by large banks from one period to the next showed a marked decline, which can be partly explained by a loss of carryover capacity as more of these institutions have become nonbound. A high absolute level of carryover resulting from a sizable excess position in one period will lead to a large absolute level of excess demand in the opposite direction in the following period.¹⁹

Daily intraperiod holdings of excess balances in 2000 again reflected banks' strong preference for concentrating their accumulation of Fed balances for purposes of satisfying period requirements late in a maintenance period (Chart 14). This pattern of demand is designed to reduce the likelihood of inadvertently accumulating unusable excess balances by the end of a maintenance period, even at the heightened risk of incurring end-of-day overdrafts earlier in the period.

B. Federal Funds Rate Behavior in 2000

Volatility in the federal funds rate, by several measures, was significantly lower in 2000 than in previous years (Table 4). Median values of daily intraday standard deviations of the funds rate, and median and average values of the absolute deviations of daily effective rates from target were the lowest since 1995,

¹⁷ Only data from RPs with maturities no longer than 3 days were examined because the Desk only collects data on the volume of dealers' overnight financing needs.

¹⁸ The only departure from this observation was in late-1997 and 1998, discussed in the 1998 annual report, when excess levels were higher than in surrounding years.

¹⁹ Average absolute carryover levels at large institutions in 2000 were down from previous years.



Chart 14

AVERAGE DAILY LEVELS OF EXCESS BALANCES



when the decline in total required balances associated with sweep accounts was just getting underway. The average of the deviations of the daily effective funds rate from target was much lower in 2000 than even in 1995, reflecting a general absence of days with huge outliers in effective rates.

Table 4Deviations of the Daily Effective Federal Funds Rate from Targetand the Daily Standard Deviation of the Intraday Funds Rate(in basis points)Entire Year

	1995	1996	1997	1998	1999	2000	
Median of Intraday Standard Deviations	5	10	9	12	9	6	
Median of Absolute Deviations of the Effective Rate from Target	5	8	6	8	7	4	
Average of Absolute Deviations of the Effective Rate from Target	10	15	11	13	11	7	

Conversations with market participants and other anecdotal evidence point to several possible explanations for the moderation in rate volatility.

- Better internal information systems for tracking and anticipating payment flows within commercial banking institutions have reduced the uncertainty about settlement flows, often the source of rate volatility, particularly late in the day. Improvement of systems and processes for tracking and anticipating payment flows has been ongoing, but it received a permanent boost as banks prepared for CDC contingencies.
- 2. Bank consolidation also may have reduced overall uncertainty about payment flows, although available data do not substantiate any decline in absolute volumes of wholesale payment flows or federal funds market activity.
- 3. The move to lagged reserve accounting has improved the ability of banks and the Desk to anticipate demands for Fed balances, although lagged accounting has been in place since August 1998.
- 4. Also facilitating the Desk's ability to estimate demand for excess reserves, the sample of large banks from which reserve information is collected daily continued to grow. The level of total required balances from the sampled banks accounted for nearly 75% of the total requirements at all large (and foreign) banks at the end of 2000.
- 5. Brokered trading in the federal funds market at rates that are a fraction of a 32nd has increased dramatically over the past year. This development can contribute to decline of 2 basis points or so in the calculation of the intraday standard deviation compared to when trading is restricted to rates that





are a fraction of a 16th. While the impact is small on days when trading occurs over a wide range of rates, the effect is noticeable on days when trading is concentrated over a narrow range of rates.

6. There have been some signs that large banks are less willing to bid up the funds rate on days when Fed balance shortfalls have forced them to borrow adjustment credit at the discount window. The distribution of peak funds rates on days when adjustment borrowing by large banks has been at least \$50 million in 2000 has shifted somewhat to lower rate levels (Chart 15). Such a shift in behavior would dampen measured rate volatility, although informal conversations with bank reserve managers do not substantiate a widespread change in attitudes about borrowing from the discount window.

Reduced rate volatility was evident on high payment flow days in 2000, as well as on other days. While morning premiums on these days in 2000 were in line with premiums in the previous year, the lower effective rates indicate that rates tended to come off more substantially later in the day than in the past (Chart 16).²⁰ Yet at the same time, intraday standard deviations were also down. This combination of changes in rate behavior suggests that trading conditions were generally more orderly over the course of the day, with rates settling back at levels closer to target for a greater volume of trading than before, perhaps reflecting improved internal information about settlement flows at banks.

²⁰ Quarter-ends, including year-ends, are excluded from the data in the chart because they tend to display some behavioral patterns that are distinct from other high payment flow days, which tend to be more homogenous in their observed rate behavior.



Chart 17





While rate volatility was down overall, it was still higher on days when total Fed balances—before any adjustment borrowing at the discount window—were at their lowest. In 2000, the level of nonborrowed Fed balances fell below \$10 billion on 9 days; on 3 of these occasions it even dropped below \$9 billion. Days with the lowest balances were heavily concentrated early in the year, when the Desk was working off the extremely high excess positions accumulated around the CDC and while total required balances were also relatively low. There were 19 other days on which these balances were under \$11 billion. By comparison, in 1999, Fed balances fell below \$10 billion only once, and they were below \$11 billion on 16 other days, while in 1998 there were no days with balances below \$11 billion (and only 2 days where balances were even below \$12 billion).

Rate volatility on days when total nonborrowed balances were under \$10 billion in 2000 tended to be higher than on other days, as measured by median values for intraday standard deviations and peak rates (Table 5). When nonborrowed balances were under \$11 billion in both 1999 and 2000 (but above \$10 billion), evidence is weak that rate volatility was any higher than on other days with higher balances.²¹

Table 5

Behavior of the Federal Funds Rate and the Level of Fed Balances before Adjustment Borrowing in 1999 and 2000 (in basis points, or number)

	Balances Below \$10 bn.	Balances Between \$10 and \$11 bn.	Balances Above \$11 bn.
Number of business days (#)	10	36	459
<i>Median values for</i> Effective – Target Rate (b.p.)	+2	-3	+1
High – Target Rate (b.p.)	+200	+25	+25
Intraday Std. Dev. (b.p.)	18	6	7

The average effective federal funds rate on settlement days was very close to target, ending a two-year period over which rates on these days tended to be soft (Chart 17).²² Rates on these days were closer to the target as some of the factors that inclined the Desk to err on the side of over-providing estimated demands

²¹ These measures of volatility on days with balances above \$11 billion are probably elevated by the inclusion of high payment flow days in the sample, all of which in 1999 and 2000 had a level of Fed balances above \$11 billion.

²² In years prior to 1998, rates on settlement days tended to be relatively firm.

reaction to the past pattern of soft rates on these days, and the even lower levels of Fed balances implied by

the decline in total required balances.

²³ Amid the pressures in financing markets in the fourth quarter of 1998 in particular, the Desk often provided added levels of liquidity, which on some occasions contributed to very soft rate conditions on maintenance period settlement days.

APPENDIX A: AUTHORIZATION FOR DOMESTIC OPEN MARKET OPERATIONS

Open market operations during 2000 were conducted under the Authorization for Domestic Open Market Operations. The modifications to several of its provisions during the year are discussed in I.C of the text. In February the Committee also approved the addition to the Authorization (paragraph 4) regarding adjustments to the stance of monetary policy during intermeeting period. The Authorization in effect at the end of 2000 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, 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 the execution of the Committee's decision regarding policy during any intermeeting period, the Committee authorizes and directs the Federal Reserve Bank of New York, upon the instruction of the Chairman of the Committee, to adjust somewhat in exceptional circumstances the degree of pressure on reserve positions and hence the intended federal funds rate. Any such adjustment shall be made in the context of the Committee's discussion and decision at its most recent meeting and the Committee's long-run objectives for price stability and sustainable economic growth, and shall be based on economic, financial, and monetary developments during the intermeeting period. Consistent with Committee practice, the Chairman, if feasible, will consult with the Committee before making any adjustment.

APPENDIX B: GUIDELINES FOR THE CONDUCT OF SYSTEM OPERATIONS IN FEDERAL AGENCY ISSUES

The FOMC has established specific guidelines for operations in agency securities to ensure that Federal Reserve operations do not have undue market effects and do not serve to support individual issuers. Provisions 3-6 of the Guidelines were temporary suspended in August 1999, in order to expand the types of agency securities the Desk could accept on its operations around the CDC period, and in March 2000 this suspension was extended until the FOMC's first meeting in 2001.

Guidelines for the Conduct of System Operations in Federal Agency Issues

1. System open market operations in Federal agency issues are an integral part of total System open market operations designed to influence bank reserves, money market conditions, and monetary aggregates.

2. System open market operations in Federal agency issues are not designed to support individual sectors of the market or to channel funds into issues of particular agencies.

3. System holdings of agency issues shall be modest relative to holdings of U.S. Government securities, and the amount and timing of System transactions in agency issues shall be determined with due regard for the desirability of avoiding undue market effects.

4. Purchases will be limited to fully taxable issues, not eligible for purchase by the Federal Financing Bank, for which there is an active secondary market. Purchases will also be limited to issues outstanding in amounts of \$300 million or over in cases where the obligations have maturity of five years or less at the time of issuance, and to issues outstanding in amounts of \$200 million or over in cases where the securities have a maturity of more than five years at the time of issuance.

5. System holdings of any one issue at any one time will not exceed 30 percent of the amount of the issue outstanding. Aggregate holdings of the issues of any one agency will not exceed 15 per cent of the amount of outstanding issues of that agency.

6. All outright purchases, sales and holdings of agency issues will be for the System Open Market Account.

APPENDIX C

Operations in United States Government Securities and Federal Agency Securities (Settlement date basis, in thousands) For the period from 12/31/1999 to 12/29/2000

		.	-	- .	Net	Holdings	Holdings
	Purchases	Sales	Redemptions	Exchanges	Changes	12/29/2000	<u>12/31/1999</u>
System Open							
Warket Account							
Government Securities							
Treasury Bills							
				(477,904,116)			
Outright	8,676,086	-	(24,521,854)	477,904,116	(15,845,768)	199,853,676	215,699,444
Matched Trans.	4,399,257,371	(4,381,187,595)	-	-	18,069,776	(21,112,267)	(39,182,043)
Total Bills	4,407,933,457	(4,381,187,595)	(24,521,854)	-	2,224,008	178,741,409	176,517,401
Treas. Notes & Bonds							
Maturing:							
Within 1 year	8,808,600	-	(3,778,704)	(54,655,642)	(49,625,746) #	73,811,576	59,899,148
1 to 5 years	14,514,092	@ -	-	46,177,176	60,691,268 #	132,791,992	124,169,064
5 to 10 years	6,084,751	@ -	-	6,584,785	12,669,536 #	55,461,173	51,106,652
Over 10 years	5,887,050	@	-	1,893,700	7,780,750 #	70,896,176	66,270,245
Total Notes and Bonds	35,294,493	-	(3,778,704)	19	31,515,808	332,960,917	301,445,109
Total Gov't secs.							
Incl. Matched Trans.	4,443,227,950	(4,381,187,595)	(28,300,558)	19	33,739,816	511,702,326	477,962,510
(Excl. Matched Trans.)	43,970,579		(28,300,558)	19	15,670,040	532,814,593	517,144,553
Federal Agency Issues							
Maturing:							
Within 1 year	-	-	(51,000)	-	(51,000) &	-	51,000
1 to 5 years	-	-	-	-	- &	130,000	10,000
5 to 10 years	-	-	-	-	- &	-	120,000
Over 10 years	-	-	-		- &	-	-
Total Agency	-	-	(51,000)	-	(51,000)	130,000	181,000
Total System Account							
Incl. Matched Trans.	4,443,227,950	(4,381,187,595)	(28,351,558)	19	33,688,816	511,832,326	478,143,510
(Excl. Matched Trans.)	43,970,579	-	(28,351,558)	19	15,619,040	532,944,593	517,325,553
<u>F.R.B. of New York</u> Tri-Party							
Repurchase Agreements	890,236,000	(987,501,000)			(97,265,000)	43,375,000	140,640,000

Note: There were no customer related RP's passed though to the market for the period from 12/31/1999 to 12/29/2000

@ includes appreciation of the inflation compensation on inflation indexed notes and bonds of \$301,011,498

and & does not include the following maturity shifts:

		Within 1 year	1 to 5 years	5 to 10 years	Over 10 years
Treasury Notes & Bonds	#	63,538,175	(52,068,340)	(8,315,015)	(3,154,820)
Federal Agencies Issued	&	-	120,000	(120,000)	-

The December 31, 1999 and December 29, 2000 matched sale-purchase transaction was \$39,182,043,000 and \$21,112,267,000, respectively.

Loans of Treasury securities by Federal Reserve Bank of New York to primary dealers for the period from 12/31/1999 to 12/29/2000 were as follows: Loans Outstanding

				Loans Outstanding		
	Securities Loans	Maturities	Net Change	12/29/2000	<u>12/31/1999</u>	
Loan Agreements	\$294,057,000	\$294,032,000	\$25,000	\$2,086,000	\$2,061,000	