

Open Market Operations during 1996

This article is 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. Gerald D. Cohen of the Domestic Money Markets Staff was primarily responsible for the preparation of this report. Many other members of the Markets Group assisted in the preparation; Cassandra Bryant and Drew Matus deserve special recognition for their invaluable research support.

During 1996, the Trading Desk at the Federal Reserve Bank of New York (the Desk) managed reserve conditions with the objective of maintaining the federal funds rate around the level desired by the Federal Open Market Committee (FOMC). As was

the case last year, the need for permanent reserve additions was relatively modest as demand for currency grew moderately and reserve requirements declined because of the continued spread of sweep programs at commercial banks. The decrease in balances of depository institutions at Reserve Banks (operating balances) had an impact on bank reserve management strategies and the Desk's choice of operations. The Desk paid close attention to the daily pattern of reserve demands and, by tailoring its operations accordingly, maintained funds trading close to the FOMC's desired rate.

At the start of 1996, available evidence indicated that a moderating economic expansion over the preceding months had reduced potential inflationary pressures going forward while price and cost trends were already subdued. The FOMC eased monetary policy slightly at its first meeting of the year, lowering the intended federal funds rate from 5½ percent to 5¼ percent (table 1). On the same day, the Board of Governors approved a reduction in the discount rate from 5¼ percent to 5 percent. By midyear, concern that inflation pressures were building caused the FOMC to adopt an asymmetric directive. However, although the pace of economic expansion was generally robust, inflation remained quiescent, and the Federal Reserve took no further policy actions to affect interest rates in reserve markets.

1. Specifications from Directives of the Federal Open Market Committee and related information, December 19, 1994–December 17, 1996

Date of meeting	Discount rate (percent)	Expected federal funds rate (percent)	Borrowing allowance for deriving NBR path (millions of dollars) ¹
12/19/94	5.25	5.50	75 50 on 1/18 ²
1/30 to 1/31/96 .	5.00 on 1/31	5.25 on 1/31	50 ³
3/26/96	5.00	5.25	75 75 on 4/25 ² 100 on 5/9 ²
5/21/96	5.00	5.25	100 150 on 5/23 ² 175 on 6/6 ² 225 on 6/20 ²
7/2 to 7/3/96 ...	5.00	5.25	225 300 on 7/5 ² 325 on 7/18 ²
8/20/96	5.00	5.25	325
9/24/96	5.00	5.25	325 300 on 9/26 ² 250 on 10/10 ² 200 on 10/24 ² 100 on 11/7 ²
11/13/96	5.00	5.25	100 75 on 11/21
12/17/96	5.00	5.25	75

1. The borrowing allowance associated with the expected federal funds rate.
2. Change in borrowing assumption reflects technical adjustment to account for actual or prospective behavior of seasonal borrowing.
3. The allowance was unchanged because the spread between the discount rate and the expected federal funds rate was not changed.

IMPLEMENTATION OF POLICY

Reserve Management Procedures and Practices

Operating Procedures

In carrying out the FOMC's policy directives, the Desk seeks to maintain the federal funds rate around the level indicated by the Committee. Current operating procedures control the supply of reserves so that they conform to the aggregate demand that banks have for holding these balances at the FOMC's desired funds rate.

The average estimated demand that banks have for holding reserves in each two-week maintenance period is embodied in the nonborrowed reserve objective or path. The path is a projection of the reserves—

balances held at the Federal Reserve plus applied vault cash—that banks must hold to meet their reserve requirements, plus any excess balances they wish to hold, less an amount of reserves that the Desk anticipates will be provided by borrowing at the discount window. Open market operations are the tool used to close any estimated gap between this demand for nonborrowed reserves and the supply forthcoming from market factors.

The borrowing allowance has retained a formal role in the construction of the nonborrowed reserve objective even though the link between the adjustment component and the spread between the federal funds and discount rates has virtually disappeared. In constructing the nonborrowed reserve objective, the Desk now expects borrowing to meet just a very small fraction of total reserve demand in most maintenance periods, even with the seasonal component added. Nevertheless, adjustment borrowing can increase to substantial levels in reaction to large, inadvertent reserve shortages that would otherwise leave banks in overdraft positions or short of meeting their reserve requirements on settlement days.

Daily Formulation and Execution of Open Market Operations

Open market operations are used to bring reserve supplies in line with demand on a daily basis to keep the funds rate at or near the level desired by the FOMC. However, while period-average demands are captured in the nonborrowed reserve objective, daily levels of demand may fluctuate. Reserve supplies can also vary from day to day because of changes in numerous underlying factors. As a result, reserve imbalances may develop on any day, potentially causing the federal funds rate to deviate from its intended level. Banks' ability to average their reserve holdings over a two-week maintenance period to meet requirements can temper the pressure on the federal funds rate when imbalances in supply and demand develop.

Each morning the Desk receives updated estimates of daily reserve supplies. The nonborrowed reserve path may be adjusted formally or informally to account for revisions to required reserves or updated judgments about the level of excess reserves that banks wish to hold. Following episodes of high adjustment borrowing, the nonborrowed reserve objective may also be adjusted to reflect the increased supply of reserves that are forthcoming from this source. Meanwhile, estimates of nonborrowed reserve supply over the same two-week period will

be updated to reflect actual levels from the previous day and the effects of any open market operations arranged the previous day and to reflect revisions to projected changes in the behavior of factors affecting nonborrowed reserves in upcoming days. Utilizing such daily reserve information, the Desk maintains the federal funds rate in a range around the expected level through its open market operations. The observed behavior of the funds rate is also used in formulating operations to the extent that it is believed to be indicative of the true level of demand or supply. However, deviations in the funds rate may reflect market participants' own perceptions about the balance between aggregate reserve supply and demand, which at times may be based on a misreading of market conditions. Thus, the Desk considers both the reserve forecasts and funds market conditions when planning open market operations.

In 1996, the Desk arranged outright purchases of securities and occasional matched-sale transactions, but the largest share of its operations was repurchase agreements (RPs). As in past years, the usual time for arranging temporary operations was 11:30 a.m. eastern time, shortly after revisions to reserve projections became available. Because activity in the RP market peaks much earlier in the morning, operations always carry some risk that available collateral will be insufficient to meet the Desk's reserve objective for the day, an outcome that in fact has occurred from time to time in recent years. For this reason, on days when the Desk intended to arrange fairly large-sized RPs, operations would sometimes be preannounced or arranged an hour or so ahead of the usual intervention time to help ensure adequate propositions.

Late in 1996, following a number of changes to the methods and times for compiling reserve data within the Federal Reserve System, the New York and Board staffs began preparing their reserve forecasts on an earlier schedule. In December, the Desk announced that, starting in 1997, its normal market entry time for temporary operations would be advanced one hour, to between 10:30 a.m. and 10:45 a.m.¹ Also starting in 1997, the Desk would begin announcing the total par value of all accepted propositions on each market operation, temporary and outright, just after their completion. Before this change, the Desk would indicate only the intended size of "customer" operations.

1. In conjunction with this change, the deadline for accepting dealers' withdrawals on term RPs that are not fixed was to be advanced one hour, to 10:00 a.m.

OPEN MARKET OPERATIONS

The general pattern of Desk activity during 1996 closely followed that of 1995, with seasonal increases in required reserves and currency demand creating reserve needs that were addressed, in part, with outright operations. The remaining needs were met with temporary operations. One factor that had an impact on the formulation of open market operations in 1996 was the growth in retail deposit sweep accounts and the associated decrease in required reserves and required operating balances. The decline in required reserves lessened the need for outright purchases. The lower required operating balances at times seemed to affect the intra-period demand for reserves. For example, on days of heavy payment flows, the demand for excess reserves seemed to be greater than in the past. The Desk was sensitive to the pattern of reserve demands and tailored its operations accordingly. Overall, banks appeared to adjust to lower required operating balances without any meaningful change in the amount of excess reserves held.

In 1996, banks and their affiliated branches swept an estimated \$170 billion from reservable transaction account balances, \$116 billion more than in the preceding year.² Estimates indicate that these sweeps scaled back reserve requirements by between \$10 billion and \$11 billion.³ Recognizing that the decline in reserve requirements could complicate their reserve management, banks increased their clearing balance requirements \$1.6 billion. The net effect of these

2. A retail sweep is initiated when balances in either a demand deposit or a negotiable order of withdrawal (NOW) account are transferred by the financial institution to a nonreservable money market deposit account (MMDA). Depending on the specific sweep arrangements, those funds may be “swept” into the MMDA either for an entire month, unless presentments exceed the account holder’s demand deposit or NOW account balances, or for the weekend. For a more in-depth discussion of sweep programs, see “Open Market Operations during 1995” in *Federal Reserve Bank of New York, Annual Report, 1995*.

All sweep estimates refer to amounts initially swept by the depository institution. These figures are not updated to include any subsequent shifts in the underlying balances.

The increase in initial sweeps during 1996 was distinguished from the activity of earlier years by two factors. First, a larger population of banks and branches opted either to initiate or to expand their sweep operations. Second, sweep activity was increasingly augmented to include demand deposits. In December 1995, initial sweeps from demand deposits were minimal, at \$230 million, or just 0.4 percent of the total. Twelve months later, these sweeps rose to \$17.1 billion, approaching 10 percent of all recorded sweeps.

3. The effect of sweeps on reserve requirements is calculated in the following manner. First, we take the level of initial sweeps, which rose \$116 billion in 1996, from \$54 to \$170 billion. Second, we apply reserve requirement ratios that are based on the level of deposits at each bank, with a 3 percent reserve requirement on the first \$52 million of deposits and a 10 percent requirement on any additional deposits. Since some smaller banks initiated sweep programs, the 10 percent requirement does not apply to all \$116 billion of sweeps.

changes, together with a slight (\$0.4 billion) increase in applied vault cash, was a \$5.5 billion decline in required operating balances, from \$24.1 billion in late 1995 to \$18.6 billion in December 1996.⁴

Permanent Activity for the System Open Market Account

Reserve Patterns

Changes in the size of the System’s portfolio of domestic securities are designed to offset movements in operating factors that affect reserve supplies as well as to accommodate shifts in reserve demand. Over time, most of the permanent expansion of the System Open Market Account (SOMA) has served to support the growth of currency. Shifts in other factors and in levels of reserve requirements, although significant in some years, over time have been of lesser importance. In 1996, currency in circulation grew \$25.0 billion, up about \$4.2 billion from its growth in 1995 but still well below the increases registered in each of the preceding three years. The need for a permanent expansion in the portfolio to support the growth in currency was moderated by a \$6.8 billion decline in required reserves.⁵ Movements in other factors affecting nonborrowed reserve supply or demand did not contribute significantly, on net, to the need for permanent changes in the portfolio.

Outright Open Market Operations

To provide reserves on a permanent basis, the System’s portfolio of domestic securities expanded \$14.7 billion over 1996, measured from year-end to year-end and excluding all temporary operations (Appendixes B and C). A total of \$17.1 billion of U.S. Treasury securities was bought outright in the market, with purchases arranged when large and sustained reserve shortages were projected to develop. Two bill passes were arranged, the first in June and the second—a record-sized \$6.5 billion purchase—in November. There were also two sets of coupon passes, the first spread over two business days in April and the second spread over four business days

4. Required reserve balances (required reserves less applied vault cash) are those balances held at the Federal Reserve to meet required reserve needs. Required operating balances include both required reserve balances and required clearing balances.

5. The decrease induced by sweep accounts was partially offset by growth in other reservable deposits. Thus, required reserves fell about \$4 billion less than the estimated sweep effect.

in August. Each set of coupon passes consisted of three separate operations covering different sectors of the yield curve. Only a very small amount of securities was purchased directly from foreign accounts. In addition to providing the reserves necessitated by movements in operating factors, outright purchases offset \$2.4 billion of redemptions of securities. These redemptions primarily reflected original issue seven-year Treasury notes and some holdings of federal agency securities that matured on dates when no suitable replacement securities were available.

After the bill pass in November, no further outright purchases were made in 1996. In previous years, a greater portion of the reserve needs caused by the late-year seasonal buildup in currency and required reserves was met with permanent additions to the SOMA, with the Desk typically arranging one additional outright operation over the balance of the year.⁶ These acquisitions also usually left the Desk in a position of having to drain reserves with temporary (and sometimes even permanent) operations in late January or early February of the following year when the seasonal increases in currency and required reserves unwound. This time of year is also typically marked by seasonally low levels of required reserve balances because levels of vault cash remain high when the level of reserve requirements declines sharply.

The absence of further outright operations in late 1996 was intended to place the Desk in a position of needing to add reserves with temporary operations when required reserve balances reached their seasonal low level early in 1997. Two factors motivated this decision. First, the Desk did not want to drain reserves during periods when low operating balances might lead to late-day firmness in the money market. Second, bank reserve managers had all their experience with new lows in operating balances in 1996 in the context of net reserve shortages. The Desk felt that it would be better situated to respond to any resultant change in funds market conditions with RPs rather than matched-sale transactions.

SOMA Portfolio Management

Over the course of the year, the Desk continued to manage the permanent holdings in the SOMA domes-

6. Over the final quarter of 1995, on net, the SOMA increased its securities holdings \$9.7 billion to help meet the \$15.0 billion seasonal increase in currency growth and reserve requirements. In the fourth quarter of 1996, the system met only \$6.4 billion of the \$18.0 billion seasonal increase in currency and required reserves through permanent increases in its portfolio.

tic portfolio in a manner that ensured the liquidity of the portfolio. Liquidity was maintained by holding Treasury bills and Treasury coupon securities in roughly equal proportions. At the same time, to minimize any influence over the available public holdings of specific issues and thereby leave debt management in the domain of the Treasury, the acquisition of bills and coupons largely mirrored the distribution of Treasury issues within these two general classes of instruments. As of the end of 1996, the net impact of all the Desk's activities affecting its permanent holdings, including rollovers of maturing securities, left the average maturity of Treasury securities in the SOMA at 41 months, about two months greater than it was one year earlier but below the 61-month average maturity of total marketable Treasury debt. The Treasury's expanded issuance of 10-year notes and 30-year bonds contributed to the slight increase in maturity of the SOMA portfolio.

In late October, the Treasury announced that it would change the treatment of SOMA's noncompetitive bids at Treasury bill auctions. Beginning in the first part of 1997, SOMA rollovers would be treated as add-ons to the publicly auctioned amount rather than deductions from the total auctioned size. This change would provide better information to market participants about the amount of bills available for sale to the public, with the only remaining uncertainty being the rollover amount of foreign institutions.

Temporary SOMA Activity

Reserve Patterns

Temporary, or self-reversing, operations are an important tool used to meet reserve needs not addressed by outright operations. These residual needs can vary considerably in size from period to period, as well as from day to day, and in 1996 ranged from moderate "drain" to sizable "add" needs. In a typical maintenance period with an add need, the Desk often arranged successive multiday RPs spanning the entire period. These operations would be supplemented by shorter-term operations as circumstances warranted. In particular, overnight operations were frequently employed on the settlement day to address all remaining period needs. Most multiday RPs were of the nonwithdrawable variety, but after the second weekend withdrawable operations were sometimes used to provide more flexibility in dealing with possible revisions to estimates of reserve supply or demand during the brief time that remained in the period. If substan-

tial reserve needs were projected in a maintenance period, overlapping term operations were sometimes used.

From the demand side, reserve needs were skewed toward the second half of maintenance periods, continuing a pattern seen in recent years. This pattern seems to be related to the decrease in required operating balances, which increases the likelihood that everyday uncertainties will bring a bank's reserve position closer to one of two extremes: either ending the day overdrawn or holding an excess position that is difficult to work off on subsequent days. Thus, banks delay fully meeting their reserve requirements until late in a maintenance period.

The profile of demand within a maintenance period was not necessarily constant throughout 1996. For example, during the second quarter, banks on average held negative cumulative excess reserves until relatively late in a maintenance period. One reason the daily pattern of excess demand within maintenance periods varied over the year is that days of heavy payment flows that heightened the demand for reserves, such as Treasury security settlement days, fell within maintenance periods at different times over the course of the year. The Desk attempted to accommodate banks' increased demand for reserves on these days as well as their desire on surrounding days to offset these elevated holdings.⁷

Fluctuations in the funds rate may arise late in the day as banks attempt to avoid either overdrafts or excess reserves, especially when low reserve requirement levels limit their flexibility. One way to observe this is through the intraday range in the funds market. The intraday range rose during early 1991, when reserve requirements were sharply reduced; in contrast, the increase over the past two years has been modest. Another measure of intraday funds rate movements is the volume-weighted standard deviation of daily trading. This statistic captures the level of variation of trading around the effective rate. The standard deviation of daily trading in the funds market increased modestly over the past two years.

Reserve Forecasts

Throughout most of 1996 the Desk was in a position of having to add a moderate amount of reserves on a

temporary basis. Most of the reserve additions were in the range of \$2.5 billion to \$7.5 billion per maintenance period. Larger operations occurred near the end of the year, when the reserve drain caused by the seasonal increase in currency demand necessitated temporary operations that added as much as \$16.3 billion of reserves on a period average basis. The largest reserve drain periods occurred in late January and early February, when currency demand was at its yearly seasonal trough.

The projections of open market operations that were needed to meet path for each reserve maintenance period have varied over the past two years and were revised within each period as required reserves and market factor projections were updated. In most periods in 1996, the revisions between the initial estimates and the final estimates were small, but large revisions—most notably the \$2.7 billion revisions in the maintenance periods ending mid-January and early December—occasionally arose.

On average, the size of market factor forecast errors made when comparing the estimates at the beginning of the period with the final projections made at the end of the period were somewhat larger during 1996 than during 1995. The main reason for this apparent deterioration in forecasting accuracy was a significant increase in the error for applied vault cash, although float and currency in circulation also showed larger errors.

The deterioration in the projections of applied vault cash is attributable to an increase in the proportion of depositories that are not bound or only intermittently bound by reserve requirements as a result of sweep accounts.⁸ For a bound institution, the level of vault cash that can be applied to reserve requirements (applied vault cash) is equal to the total vault cash held by that institution in the previous maintenance period. Data on applied vault cash are available for these banks early in the maintenance period. However, for institutions that are nonbound, applied vault cash equals the current level of required reserves, for which final numbers are known only after the maintenance period ends. As more institutions have become nonbound because of sweep arrangements, projections of aggregate applied vault cash have depended more heavily on forecasts of aggregate required reserves and less on known amounts of lagged total vault cash. Moreover, sweep accounts have increased the number of institutions that switch between being

7. Actual excess holdings are affected by the Desk's own reserve management decisions and are subject to unexpected movements in reserve supply arising from operating factors. The Desk's operations are designed to provide a level of reserve supply consistent with its best estimate of demand.

8. A bank is said to be "bound" by reserve requirements if its holdings of vault cash are insufficient to meet all of its reserve requirement and it consequently must hold positive balances in its account with the Federal Reserve.

bound and nonbound from maintenance period to maintenance period, complicating the projection problem. Staff have mitigated the forecast errors somewhat by modifying procedures and software to take full advantage of incoming data on individual institutions so that applied vault cash projections are updated as the maintenance period progresses. However, errors are likely to remain somewhat larger under the current reserve requirement structure.

Temporary Open Market Operations

As a result of the issues discussed above and the effect of low operating balances, the Desk relied on a larger number of overnight system operations. These were used to tailor reserve positions to the day-to-day fluctuations in the intra-period demand for reserves, a demand that was often revealed by the behavior of the funds rate. The number of multiday operations was similar to that in recent years, but the Desk lengthened the maturity of many of the operations this year.

The total volume of arranged RPs exceeded that in 1995, in part because of a decision by the Manager of the System Open Market Account to conduct fewer outright operations late in the year. The Desk met the larger need at the end of 1996 by layering a number of sizable, relatively long-lived, temporary operations. Although this strategy received a fair amount of attention from market participants, empirical analysis suggests that the funds market traded much as it had in previous years when the temporary need was smaller and much as it had been trading in 1996 before the seasonal add need developed.

APPENDIX A: AUTHORIZATION FOR DOMESTIC OPEN MARKET OPERATIONS

Open market operations during 1996 were conducted under the Authorization for Domestic Open Market Operations. No temporary change was made to the authorization during 1996, and the authorized limit on intermeeting-period changes in System account holdings of U.S. government and federal agency securities was held to \$8 billion throughout the year.

The Authorization for Domestic Open Market Operations in effect for 1996 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 \$8.0 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) When appropriate, to buy or sell in the open market, from or to acceptance dealers and foreign accounts maintained at the Federal Reserve Bank of New York, on a cash, regular, or deferred delivery basis, for the account of the Federal Reserve Bank of New York at market discount rates, prime bankers acceptances with maturities of up to nine months at the time of acceptance that (1) arise out of the current shipment of goods between countries or within the United States, or (2) arise out of the storage within the United States of goods under contract of sale or expected to move into the channels of trade within a reasonable time and that are secured throughout their life by a warehouse receipt or similar document conveying title to the underlying goods; provided that the aggregate amount of bankers acceptances held at any one time shall not exceed \$100 million;

(c) 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, and prime bankers acceptances of the types authorized for purchase under 1(b) above, from dealers for the account of the Federal Reserve Bank of New York under agreements for repurchase of such securities, obligations, or acceptances in fifteen 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; and provided further that in the event bankers acceptances covered by any such agreement are not repurchased by the seller, they shall continue to be held by the Federal Reserve Bank or shall be sold in the open market.

2. In order to ensure the effective conduct of open market operations, the Federal Open Market Committee authorizes and directs the Federal Reserve Banks to lend U.S. government securities held in the System Open Market Account to government securities dealers and to banks

participating in government securities clearing arrangements conducted through a Federal Reserve Bank, under such instructions as the Committee may specify from time to time.

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 1(a) under agreements providing for the resale

by such accounts of those securities within fifteen 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(c), 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.

APPENDIX B

B.1. Operations in U.S. Treasury securities and federally sponsored agency securities by the Federal Reserve Bank of New York, December 31, 1995–December 31, 1996

Thousands of dollars

Type of issue and maturity category	Purchases	Sales	Redemptions	Exchanges	Net change	Holdings, 12/31/96	Holdings, 12/31/95
Operations for the System Open Market Account							
<i>Government securities</i>							
<i>Treasury bills</i>							
Outright transactions	9,900,700	0	0	-426,928,496	9,900,700	...	...
				426,928,496			
<i>Matched sale–purchase transactions</i>							
Market	3,092,399,472	3,094,769,379	0	0	-2,369,907	14,706,039,000	12,336,132,000
Foreign official	52,874,000	52,874,000	0	0	0	0	0
	3,039,525,472	3,041,895,379	0	0	-2,369,907	14,706,039,000	12,336,132,000
<i>Total Treasury bills</i>							
Including matched transactions ..	3,102,300,172	3,094,769,379	0	0	7,530,793	190,646,505	183,115,712
Excluding matched transactions ..	9,900,700	0	0	0	9,900,700	205,352,544	195,451,844
<i>Treasury notes and bonds</i>							
Within 1 year	524,200	0	2,014,839	-41,395,214	-42,885,853 ¹	29,045,221	41,419,243
1 to 5 years	3,898,400	0	0	31,459,662	35,358,062 ¹	95,607,624	85,272,558
5 to 10 years	1,116,100	0	0	6,665,552	7,781,652 ¹	33,781,913	31,469,096
More than 10 years	1,655,000	0	0	3,270,000	4,925,000 ¹	41,825,857	39,920,857
Total notes and bonds	7,193,700	0	2,014,839	0	5,178,861	200,260,615	195,081,754
<i>Total Treasury securities</i>							
Including matched transactions	3,109,493,872	3,094,769,379	2,014,839	0	12,709,654	390,907,120	378,197,466
Excluding matched transactions	17,094,400	0	2,014,839	0	15,079,561	405,613,159	390,533,598
<i>Federally sponsored agency issues</i>							
<i>Rollovers</i>							
Within 1 year	0	0	244,295	-3,006,000	...	...	...
				2,906,000	-344,295 ²	1,223,050	1,241,295
1 to 5 years	0	0	130,000	100,000	-30,000 ²	519,900	840,950
5 to 10 years	0	0	35,000	0	-35,000 ²	456,750	526,750
More than 10 years	0	0	0	0	0 ²	25,000	25,000
Total agency issues	0	0	409,295	0	-409,295	2,224,700	2,633,995
<i>Total System Account</i>							
Including matched transactions	3,109,493,872	3,094,769,379	2,424,134	0	12,300,359	393,131,820	380,831,461
Excluding matched transactions	17,094,400	0	2,424,134	0	14,670,266	407,837,859	393,167,593
Operations for the Federal Reserve Bank of New York Account							
<i>Repurchase agreements (RPs) by the Federal Reserve Bank of New York</i>							
For the System	532,921,000	-525,200,000	0	0	7,721,000	21,583,000	13,862,000
Customer-related, passed through to the market	64,920,000	-64,920,000	0	0	0	0	0

1. Does not include the following maturity shifts (in thousands of dollars):

<i>Within 1 year</i>	<i>1 to 5 years</i>	<i>5 to 10 years</i>	<i>More than 10 years</i>
30,511,831	-25,022,996	-5,468,835	-20,000

2. Does not include the following maturity shifts (in thousands of dollars):

<i>Within 1 year</i>	<i>1 to 5 years</i>	<i>5 to 10 years</i>	<i>More than 10 years</i>
326,050	-291,050	-35,000	0

APPENDIX C

C.1. Total U.S. Treasury and federally sponsored agency securities held in the System Open Market Account, December 31, 1996

Thousands of dollars

Item	Holdings	Net change since 12/31/95
Total agency issues	2,224,700	-409,295
Total U.S. Treasury securities	390,907,120	12,709,654
Bills	190,646,505	7,530,784
Notes	150,921,721	1,588,571
Bonds	49,338,894	5,270,290
Total U.S. Treasury and agency issues	393,131,820	12,300,359

C.2. U.S. Treasury bills held in the System Open Market Account, December 31, 1996

Thousands of dollars, except as noted

Maturity date of issue outstanding	Holdings 12/31/96	Percentage of total issue outstanding
1/02/97	7,161,430	25.1
1/09/97 ¹	107,320 ²	25.8
1/16/97 ¹	4,580,821 ²	26.8
1/23/97	6,832,500	25.2
1/30/97	6,957,815	25.4
2/06/97	13,208,010	28.6
2/13/97	6,825,485	25.7
2/20/97	6,828,664	25.2
2/27/97	7,135,180	27.3
3/06/97	11,995,955	26.7
3/13/97	6,946,501	28.7
3/20/97	6,473,243	26.9
3/27/97	6,304,235	25.7
4/03/97	8,355,000	25.6
4/10/97	3,617,000	27.5
4/17/97	3,400,000	26.1
4/24/97	3,200,000	24.4
5/01/97	8,725,000	26.1
5/08/97	4,200,000	29.4
5/15/97	3,600,000	25.6
5/22/97	3,500,000	24.8
5/29/97	8,916,000	26.7
6/05/97	3,750,000	26.6
6/12/97	3,732,826	28.5
6/19/97	3,491,067	26.8
6/26/97	8,375,000	25.6
7/24/97	4,950,000	24.5
8/21/97	5,200,000	25.3
9/18/97	5,325,000	26.8
10/16/97	6,425,000	31.8
11/13/97	5,000,000	24.8
12/11/97	5,527,453	26.9
Total	190,646,505	...
Net change from 12/31/95	7,530,784	...

1. Holdings of the January 9 Treasury bills were reduced \$11,900,000 and holdings of the January 16 Treasury bills by \$2,806,039 reflecting sales under matched sale-purchase agreements.

2. The percentages include the amounts that were sold under matched sale-purchase transactions.

C.3. U.S. Treasury notes held in the System Open Market Account, December 31, 1996

Thousands of dollars, except as noted

Coupon	Maturity date	Holdings, 12/31/96	Percentage of total issue outstanding	Net change since 12/31/95
Total that matured in 1996		0	...	-41,189,243
8.000	1/15/97	606,500	6.3	8,000
6.250	1/31/97	150,000	1.6	0
7.500	1/31/97	400,000	2.2	0
4.750	2/15/97	1,794,796	9.1	95,000
6.750	2/28/97	472,000	4.8	0
6.875	2/28/97	597,000	3.2	22,000
6.625	3/31/97	1,050,000	5.4	0
6.875	3/31/97	484,000	4.3	0
8.500	4/15/97	775,700	9.8	114,200
6.500	4/30/97	735,000	4.0	385,000
6.875	4/30/97	965,000	8.5	0
6.500	5/15/97	3,665,000	16.9	250,000
8.500	5/15/97	564,000	5.7	0
6.125	5/31/97	725,000	3.8	0
6.750	5/31/97	403,000	3.7	0
5.625	6/30/97	692,435	3.6	0
6.375	6/30/97	430,000	3.9	0
8.500	7/15/97	997,710	11.9	127,000
5.500	7/31/97	400,000	3.3	0
5.875	7/31/97	286,970	1.5	0
6.500	8/15/97	2,282,945	11.4	20,000
8.625	8/15/97	497,000	5.3	0
5.625	8/31/97	574,000	5.2	0
6.000	8/31/97	719,830	3.7	50,000
5.500	9/30/97	541,000	4.5	0
5.750	9/30/97	536,380	2.8	25,000
8.750	10/15/97	756,000	8.6	25,000
5.625	10/31/97	552,000	2.9	2,000
5.750	10/31/97	315,000	2.8	0
7.375	11/15/97	3,218,000	15.5	308,000
8.875	11/15/97	600,000	6.1	0
5.375	11/30/97	602,475	3.2	200,000
6.000	11/30/97	275,700	2.4	0
5.250	12/31/97	880,000	4.6	880,000
6.000	12/31/97	500,780	4.1	0
7.875	1/15/98	877,800	9.6	50,000
5.000	1/31/98	956,730	5.0	956,730
5.625	1/31/98	646,000	5.3	50,000
7.250	2/15/98	3,288,560	15.7	173,000
8.125	2/15/98	440,000	4.8	50,000
5.125	2/28/98	1,357,320	4.4	903,320
5.125	3/31/98	1,295,000	9.9	0
6.125	3/31/98	1,598,220	7.4	1,598,220
7.875	4/15/98	584,500	6.6	0
5.125	4/30/98	495,000	4.1	0
5.875	4/30/98	926,000	4.3	926,000
6.125	5/15/98	3,451,517	16.3	7,500
9.000	5/15/98	478,000	5.2	0
5.375	5/31/98	805,000	6.5	0
6.000	5/31/98	671,000	3.2	671,000
5.125	6/30/98	1,471,000	11.7	0
6.300	6/30/98	1,177,000	5.4	1,177,000
8.250	7/15/98	1,275,140	13.1	55,000
5.250	7/31/98	472,000	4.0	0
6.250	7/31/98	866,750	4.0	866,750
5.875	8/15/98	4,489,808	20.0	310,000
9.250	8/15/98	1,011,000	8.9	177,000
4.750	8/31/98	591,000	4.5	0
6.125	8/31/98	784,300	3.6	784,300
4.750	9/30/98	944,000	7.5	44,000
6.000	9/30/98	931,000	4.4	931,000
7.125	10/15/98	968,593	9.5	0
4.750	10/31/98	857,900	6.6	0
5.875	10/31/98	825,000	3.9	825,000
5.500	11/15/98	2,519,635	12.2	35,000
8.875	11/15/98	535,000	5.4	25,000
5.125	11/30/98	929,000	7.7	50,000
5.625	11/30/98	285,000	1.4	285,000
5.125	12/31/98	1,579,662	12.7	0
5.750	12/31/98	875,000	4.2	875,000
6.375	1/15/99	892,045	8.5	36,500
5.000	1/31/99	377,000	2.9	0

C.3.—Continued

Thousands of dollars, except as noted

Issue outstanding		Holdings, 12/31/96	Percentage of total issue outstanding	Net change since 12/31/95
Coupon	Maturity date			
5.000	2/15/99	3,472,140	15.8	3,472,140
8.875	2/15/99	845,000	8.7	152,000
5.500	2/28/99	435,000	3.7	0
5.875	3/31/99	1,875,000	14.6	0
7.000	4/15/99	1,073,700	10.5	0
6.500	4/30/99	1,219,620	9.9	0
6.375	5/15/99	2,602,124	11.2	2,602,124
9.125	5/15/99	1,127,500	11.3	0
6.750	5/31/99	586,990	4.8	0
6.750	6/30/99	1,644,820	12.6	1,000
6.375	7/15/99	349,000	3.5	2,000
6.875	7/31/99	1,146,400	9.3	117,400
6.000	8/15/99	1,780,110	7.8	1,780,110
8.000	8/15/99	797,600	7.8	29,600
6.875	8/31/99	701,480	5.7	100,000
7.125	9/30/99	1,078,752	8.4	0
6.000	10/15/99	406,115	3.9	0
7.500	10/31/99	508,315	4.2	10,000
5.875	11/15/99	2,715,968	11.9	2,715,968
7.875	11/15/99	687,000	6.4	20,000
7.750	11/30/99	412,145	3.5	77,300
7.750	12/31/99	1,354,665	10.9	25,000
6.375	1/15/00	689,545	6.8	0
7.750	1/31/00	612,440	5.1	80,000
8.500	2/15/00	832,000	7.8	0
7.125	2/29/00	935,290	7.5	65,000
6.875	3/31/00	1,205,510	9.2	60,000
5.500	4/15/00	360,000	3.4	0
6.750	4/30/00	767,750	6.2	115,000
8.875	5/15/00	480,000	4.6	0
6.250	5/31/00	642,460	5.1	15,000
5.875	6/30/00	740,100	5.9	15,100
6.125	7/31/00	385,000	3.1	10,000
8.800	8/15/00	844,400	7.6	0
6.250	8/31/00	515,000	4.3	0
6.125	9/30/00	724,000	6.0	199,000
5.750	10/31/00	537,430	4.4	0
8.500	11/15/00	841,000	7.3	25,000
5.625	11/30/00	380,000	3.1	30,000
5.500	12/31/00	800,000	6.3	800,000
5.250	1/31/01	800,000	6.3	800,000
7.750	2/15/01	677,500	6.0	0
5.625	2/28/01	800,000	6.3	800,000
6.375	3/31/01	1,500,000	10.6	1,500,000
6.250	4/30/01	865,000	6.3	865,000
8.000	5/15/01	892,000	7.2	0
6.500	5/31/01	655,000	4.8	655,000
6.625	6/30/01	1,100,000	7.7	1,100,000
6.625	7/31/01	700,000	5.0	700,000
7.875	8/15/01	1,115,000	9.1	20,000
6.500	8/31/01	525,000	3.8	525,000
6.375	9/30/01	650,000	4.5	650,000
6.250	10/31/01	570,000	3.9	570,000
7.500	11/15/01	1,543,000	6.4	175,000
5.875	11/30/01	190,000	1.4	190,000
6.125	12/31/01	600,000	4.3	600,000
7.500	5/15/02	981,009	8.4	0
6.375	8/15/02	2,190,000	9.2	0
6.250	2/15/03	2,095,000	8.9	0
5.750	8/15/03	3,620,000	12.9	0
5.875	2/15/04	550,000	4.2	0
7.250	5/15/04	1,880,550	13.1	0
7.250	8/15/04	810,000	6.1	60,000
7.875	11/15/04	1,613,040	11.3	10,000
7.500	2/15/05	1,150,000	8.3	0
6.500	5/15/05	2,000,000	13.6	0
6.500	8/15/05	1,800,000	12.9	0
5.875	11/15/05	1,700,000	11.2	0
5.625	2/15/06	1,500,000	9.7	1,500,000
6.875	5/15/06	1,700,000	10.6	1,700,000
7.000	7/15/06	1,620,752	7.1	1,620,752
6.500	10/15/06	1,844,800	8.2	1,844,800
Total Treasury notes	...	150,921,721	...	1,588,571

C.4. U.S. Treasury bonds held in the System Open Market Account, December 31, 1996

Thousands of dollars, except as noted

Issue outstanding		Holdings, 12/31/96	Percentage of total issue outstanding	Net change since 12/31/95
Coupon	Maturity date			
Total that matured in 1996		0	...	0
3.500	11/15/98	30,750	10.3	0
11.750	2/15/01	160,803	10.7	0
13.125	5/15/01	165,726	9.2	0
8.000	8/15/01	0	0	-505,810 ¹
13.375	8/15/01	256,092	14.2	0
15.750	11/15/01	172,904	9.6	0
14.250	2/15/02	159,800	8.9	0
11.625	11/15/02	347,850	12.4	0
10.750	2/15/03	739,250	24.6	85,000
10.750	5/15/03	256,000	8.0	50,000
11.125	8/15/03	432,500	12.4	6,100
11.900	11/15/03	505,240	6.9	56,000
12.375	5/15/04	769,786	20.3	121,000
13.750	8/15/04	367,000	9.2	176,000
11.625	11/15/04	519,200	6.3	0
8.250	5/15/05	1,513,660	36.0	0
12.000	5/15/05	214,476	5.0	0
10.750	8/15/05	882,000	9.5	357,000
9.375	2/15/06	20,000	.4	0
7.625	2/15/07	1,396,164	33.2	0
7.875	11/15/07	378,500	25.2	0
8.375	8/15/08	788,500	37.5	0
8.750	11/15/08	1,588,500	30.5	0
9.125	5/15/09	891,205	19.4	20,000
10.375	11/15/09	1,075,939	25.6	0
11.750	2/15/10	717,400	28.7	0
10.000	5/15/10	1,176,556	39.2	0
12.750	11/15/10	1,260,865	26.8	0
13.875	5/15/11	1,073,542	23.3	30,000
14.000	11/15/11	885,091	18.1	0
10.375	11/15/12	1,611,741	14.7	0
12.000	8/15/13	3,040,772	20.5	25,000
13.250	5/15/14	869,450	17.4	259,000
12.500	8/15/14	905,720	17.8	50,000
11.750	11/15/14	1,195,000	19.9	0
11.250	2/15/15	1,335,733	10.5	0
10.625	8/15/15	905,000	12.7	0
9.875	11/15/15	501,500	7.3	35,000
9.250	2/15/16	780,000	10.7	0
7.250	5/15/16	995,000	5.3	0
7.500	11/15/16	1,185,000	6.3	140,000
8.750	5/15/17	744,000	4.1	200,000
8.875	8/15/17	820,000	5.9	0
9.125	5/15/18	296,900	3.4	0
9.000	11/15/18	256,000	2.8	0
8.875	2/15/19	583,000	3.0	0
8.125	8/15/19	1,574,900	7.8	130,000
8.500	2/15/20	590,879	5.8	0
8.750	5/15/20	605,000	5.9	165,000
8.750	8/15/20	1,113,000	10.1	348,000
7.875	2/15/21	463,000	4.2	38,000
8.125	5/15/21	610,000	5.1	120,000
8.125	8/15/21	360,000	3.0	0
8.000	11/15/21	855,000	2.6	50,000
7.250	8/15/22	445,000	4.3	45,000
7.625	11/15/22	470,000	4.4	0
7.125	2/15/23	982,000	5.3	0
6.250	8/15/23	980,000	4.3	0
7.500	11/15/24	450,000	3.9	0
7.625	2/15/25	700,000	6.0	0
6.875	8/15/25	1,100,000	8.7	0
6.000	2/15/26	900,000	7.0	900,000
6.750	8/15/26	900,000	8.3	900,000
6.500	11/15/26	1,470,000	12.8	1,470,000
Total Treasury bonds	...	49,338,894	...	5,270,290

1. Called issue.

C.5. Federal Home Loan Bank securities held in the System Open Market Account, December 31, 1996

Thousands of dollars, except as noted

Issue outstanding		Holdings, 12/31/96	Percentage of total issue outstanding	Net change since 12/31/95
Coupon	Maturity date			
Total that matured in 1996 .....	...	0	...	-116,000
6.850	2/25/97	26,700	.6	0
7.650	3/25/97	12,000	2.6	0
9.150	3/25/97	5,000	1.7	0
6.990	4/25/97	14,000	3.8	0
5.260	4/27/98	14,000	4.7	0
9.250	11/25/98	5,000	1.1	0
9.300	1/25/99	2,000	.6	0
8.600	6/25/99	3,900	1.2	0
8.450	7/26/99	5,000	2.0	0
8.600	8/25/99	11,000	4.5	0
8.375	10/25/99	10,000	3.7	0
8.600	1/25/00	6,000	2.0	0
Total .....	...	114,600	...	-116,000

C.7. Federal Farm Credit Bank securities held in the System Open Market Account, December 31, 1996

Thousands of dollars, except as noted

Issue outstanding		Holdings, 12/31/96	Percentage of total issue outstanding	Net change since 12/31/95
Coupon	Maturity date			
Total that matured in 1996 .....	...	0	...	-887,000
5.330	1/02/97	195,000	12.4	195,000
5.560	1/02/97	85,000	12.4	85,000
5.320	2/03/97	125,000	7.9	125,000
5.660	2/03/97	36,000	7.4	36,000
5.220	3/03/97	270,000	16.0	270,000
5.430	3/03/97	50,000	14.7	50,000
5.450	4/01/97	40,000	13.3	40,000
5.340	5/01/97	29,000	7.0	29,000
5.290	6/02/97	57,000	15.8	57,000
11.900	10/20/97	15,000	3.3	0
8.650	10/01/99	10,000	2.9	0
Total .....	...	912,000	...	0

C.6. Federal National Mortgage Association securities held in the System Open Market Account, December 31, 1996

Thousands of dollars, except as noted

Issue outstanding		Holdings, 12/31/96	Percentage of total issue outstanding	Net change since 12/31/95
Coupon	Maturity date			
Total that matured in 1996 .....	...	0	...	-188,500
7.600	1/10/97	160,000	9.7	0
9.200	6/10/97	27,000	4.5	0
8.950	7/10/97	10,000	1.7	0
9.550	9/10/97	35,000	7.0	0
5.700	9/11/97	0	0	-45,000 ¹
5.350	10/10/97	4,700	.6	0
8.650	2/10/98	10,000	1.6	0
5.300	3/11/98	50,000	6.3	0
9.150	4/10/98	30,000	5.0	0
9.400	8/10/98	50,000	10.0	0
7.850	9/10/98	48,000	7.4	0
5.300	12/10/98	15,000	2.1	0
7.050	12/10/98	30,000	2.7	0
9.550	3/10/99	25,000	3.6	0
7.500	3/10/99	0	0	-50,000 ¹
8.700	6/10/99	23,000	2.8	0
8.450	7/12/99	5,000	1.0	0
7.000	8/11/99	15,000	3.0	0
6.450	10/14/99	100,000	25.0	100,000
8.350	11/10/99	7,000	.4	0
6.100	2/10/00	25,000	5.0	0
9.050	4/10/00	10,000	1.3	0
9.200	9/11/00	10,000	2.5	0
8.625	4/10/01	0	0	-35,000 ¹
8.700	6/11/01	0	0	-20,000 ¹
8.875	7/10/01	0	0	-5,000 ¹
7.200	1/10/02	10,000	2.0	0
7.900	4/10/02	10,000	1.4	0
7.800	6/10/02	40,100	6.7	0
7.300	7/10/02	12,000	2.4	0
6.950	9/10/02	35,000	5.4	0
6.625	4/10/03	30,000	4.3	0
6.450	6/10/03	25,000	5.0	0
6.200	7/10/03	15,000	3.0	0
5.800	12/10/03	10,000	1.3	0
7.600	4/14/04	100,000	12.5	0
7.550	6/10/04	24,650	3.1	0
8.050	7/14/04	5,000	.8	0
8.250	10/12/04	30,000	7.5	0
6.850	9/12/05	20,000	5.0	0
6.700	11/10/05	100,000	25.0	0
10.350	12/10/15	10,000	4.0	0
8.200	3/10/16	15,000	3.7	0
Total .....	...	1,181,450	...	-243,500

1. Called issue.

C.8. Federal Land Bank securities held in the System Open Market Account, December 31, 1996

Thousands of dollars, except as noted

Issue outstanding		Holdings, 12/31/96	Percentage of total issue outstanding	Net change since 12/31/95
Coupon	Maturity date			
Total that matured in 1996 .....	...	0	...	-49,795
7.350	1/20/97	16,650	3.7	0
Total .....	...	16,650	...	-49,795