

Chapter 6

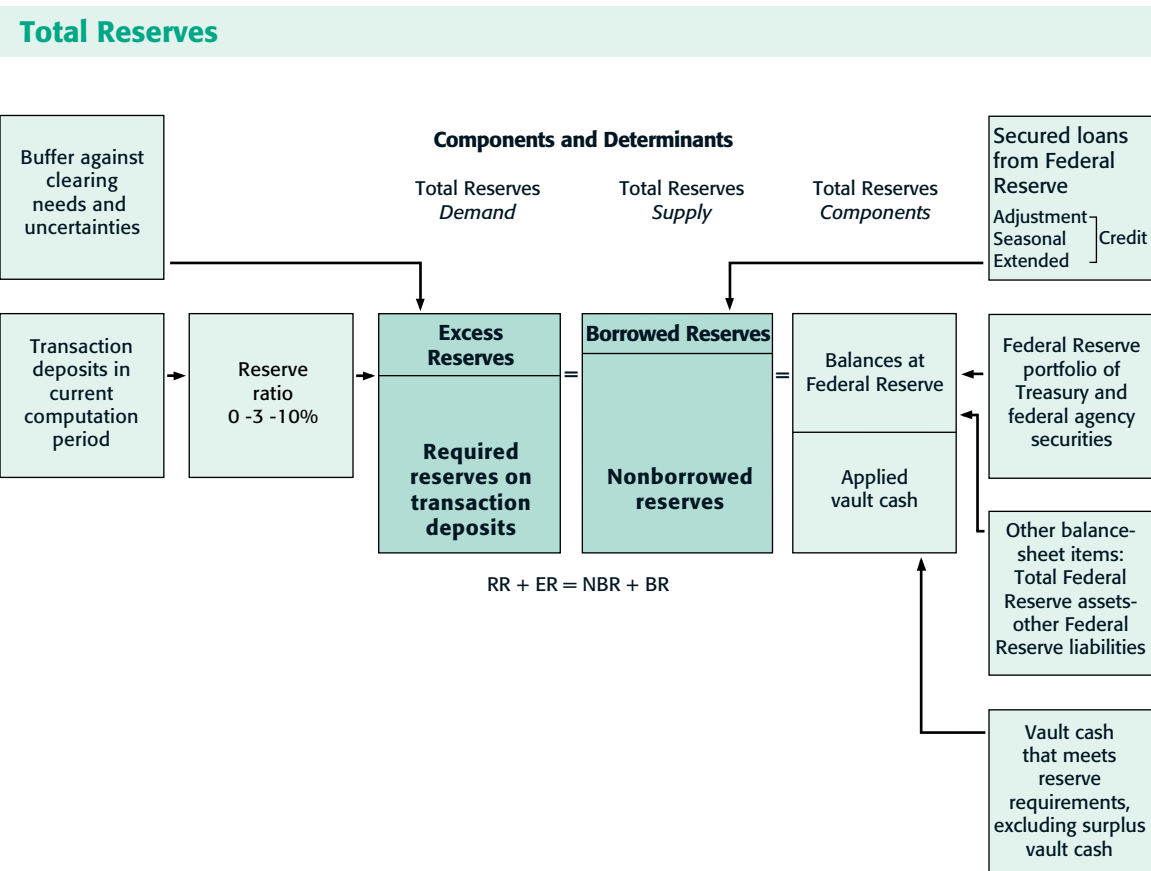
The Trading Desk—Policy Guidelines and Reserve Measures

The FOMC's monetary policy decisions embodied in the directive are implemented on a day-to-day basis primarily through the use of open market operations—defined as outright and temporary purchases or sales of government securities by the Federal Reserve. Open market operations are planned and carried out at the Federal Reserve Bank of New York by units within the Markets Group, referred to collectively as the Open Market Desk, the Trading Desk or, more simply, the Desk.

Implementing FOMC Policy Decisions

To implement the FOMC's policy instructions, the open market area seeks to manage reserve levels of depository institutions in a way that will encourage the Federal funds rate to trade around the level agreed to by the Committee.¹ Effectively, Open Market Desk personnel adjust quantities (of reserves) to achieve a price (the Federal funds rate). To guide decisions about reserve quantities, the Open Market Desk develops estimates of the banking system's likely demand for total reserves. Estimated demands arise from the banks' needs to meet reserve requirements and in some cases to hold additional reserve balances to avoid unintended shortages. Banks' demand for total reserves (TR) can be expressed as the sum of required reserves (RR) plus banks' desired excess reserves (ER). (Box A, pp. 150-5, describes the various reserve measures.)

The Desk then estimates the volume of nonborrowed reserves (NBR) that will be available to the banking system in the absence of any additional open market operations. Initial estimated supplies result from past open market operations and estimates of the impact of other factors affecting reserves. (These latter items, often referred to as market factors because they are not under direct Federal Reserve control, are described in Box B, pp. 156-61.) If estimated supplies differ significantly from estimated demands, the Desk will generally add or drain reserves through open market operations to balance reserve supplies with demands, a process described in the following chapter. If the Desk does not fully meet the demand for reserves, the banks must meet the balance at the discount window with borrowed reserves (BR). Supply and demand must balance such that $TR = RR + ER = NBR + BR$. (The diagram illustrates reserve supplies and demands.)



1. Evolving Procedures

The FOMC's directive still refers to the degree of pressure on reserve positions. Traditionally, that meant instructing the Desk to change interest rates by altering the share of the demand for reserves met with nonborrowed reserves. To increase reserve pressures, the Desk would increase the expected amount of discount window borrowing to force banks to borrow more. As a group, the banks would be left short of nonborrowed reserves. They could bid reserves away from other banks, which would increase the funds rate, but it would not eliminate the systemwide reserve shortage. That would happen only when the higher funds rate induced some banks to borrow reserves at the discount window. The banks' actions would bring reserve supplies up to the level demanded.²

To reduce reserve pressures, the Desk used to increase the proportion of reserve demands met with nonborrowed reserves. As banks needed to borrow less, they put less pressure on the Federal funds rate. Banks as a group could reduce the aggregate amount of total reserves directly only to the extent that they could reduce their discount window borrowing. The mechanism thus depended on there being a significant amount of routine borrowing. If not, banks would have unwanted excess reserves. Equilibrium in that case would be achieved only when the funds rate had fallen close enough to zero for the banks to be willing to hold the excesses.

2. Recent Modifications

As discussed in Chapter 2, this mechanism has not worked well for a number of years. The amounts of reserve pressure and borrowing have ceased to be closely linked. A series of financial difficulties in the banking system starting in 1984 led banks to go to considerable lengths to avoid using adjustment credit. The funds rate often had to rise to extraordinary levels—rates of 20 to 30 percent were not uncommon and much higher rates occurred occasionally—to induce banks to borrow significant amounts. Because the Fed did not try to force banks to borrow when they were so reluctant, borrowing was routinely at minimal levels.

Because of these difficulties in achieving a subtle response of the Federal funds rate to changes in the amount of borrowing, achieving the degree of reserve pressures specified in the directive has been interpreted since the late 1980s to mean creating conditions consistent with the FOMC's desired Federal funds rate. That rate has generally been apparent to the banks; since 1994 it has been

announced formally and in prior years it was clearly indicated through an open market operation. The rate has tended to move to the new, preferred level as soon as the banks knew the intended rate, with little or no change in the amount of borrowing allowed for when constructing the path for nonborrowed reserves (described below).

Preparing Reserve Paths

1. Forecasting Required Reserves

To construct the nonborrowed reserve path at the start of a two-week reserve maintenance period, projection staff members at the New York Federal Reserve and the Board of Governors in Washington, D.C., first estimate required reserves. They do so by forecasting transaction deposit behavior and average reserve requirement ratios. The staffs estimate the underlying deposit trends and the impact of technical and seasonal factors. They forecast the underlying behavior by looking at recent trends in transaction deposits and considering how interest rate movements and economic developments are likely to affect them. For instance, deposits may be growing rapidly because interest rates on market instruments are falling faster than the rates on deposits. As indicated in Chapter 1, a key technical development has been the spread of sweep accounts, which reduced required reserves slightly in 1994 and more rapidly in 1995 and 1996. In making the forecasts, the staffs responded to reports of planned and actual sweep account introductions.

A prominent seasonal factor affecting deposits is the buildup in balances to accommodate the extra transactions during the holiday period, stretching from late November to early January (and the sharp reversal during January). A shorter term seasonal pattern arises from the payment of social security benefits on the third of each month; most recipients allow their cash balances to rise initially, then gradually work down the deposits as they pay their bills. (The Treasury's total cash position might show offsetting movements, but most Treasury cash is not subject to reserve requirements.³) Staff estimates rely on experience with these events to forecast transaction deposits.⁴

Once the projection staffs have developed forecasts of total transaction deposits, they must estimate the appropriate average required reserve ratios to use in deriving required reserves. Transaction deposits are divided into three tranches, with indexed cutoffs that change slightly each year. In 1996, the first \$4.3 million of

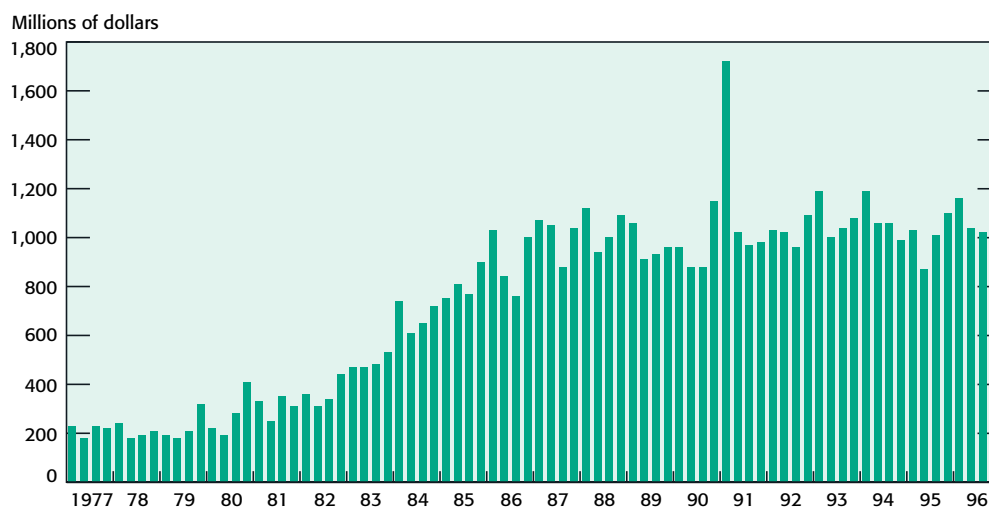
transaction deposits was exempt from reserve requirements. Then, deposits up to \$52 million were subject to a 3 percent reserve ratio. All transaction deposits above \$52 million were subject to a 10 percent reserve ratio. Because of the tranches, average reserve ratios on transaction deposits change as deposits move among different-sized institutions. In 1996, the maintenance period averages ranged from 7.417 to 7.911 percent.

During each maintenance period, the staffs frequently update their forecasts of required reserves as information on actual deposit levels becomes available. Usually, they do so during the middle part of the period in response to preliminary data on deposit levels for the first week of the period.⁵ The staffs make further adjustments late in the period when they receive preliminary deposit data for the second week and actual data for the first week's figures. They continue to revise required reserves after the period has ended, taking into account the more complete information received. However, these changes will not affect the Desk's reserve provision for that period.

2. The Allowance for Excess Reserves and the Behavior of Required Reserve Balances

Usually, the nonborrowed reserve path includes a standard allowance for excess reserves because average excess reserve levels have been relatively steady since the late 1980s (Chart 1). Between

Chart 1. Quarterly Average Excess Reserve Levels



Source: Board of Governors of the Federal Reserve System.

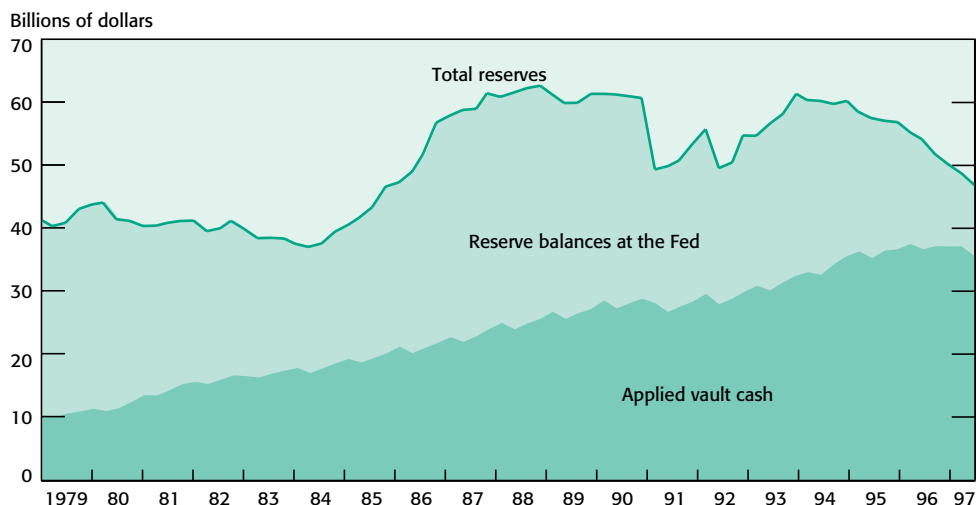
1991 and 1996, the standard allowance was \$1 billion. Generally, allowances for deviations from the standard amount are made informally, although occasionally the recorded reserve path has been changed. Variations from the norm are forecast through the use of econometric models, staff judgment, and from observing banks' appetite for reserves during the period. Excess reserves are most likely to differ substantially from the norm in certain reserve periods: when the period includes a year-end, when unusually large excesses or deficits are carried into the period, or when required reserve balances drop sharply, either because of a reduction in reserve ratios or, early in the year, when reservable deposits are seasonably low.

Both the average level and the period-to-period variability of excess reserves are influenced by the level of required reserve balances. Higher required reserve balances increase the underlying stability of the banks' demand for reserves. With higher balances, banks have more day-to-day flexibility within a maintenance period to manage their reserve positions against the background of unpredictable flows of funds through their reserve accounts. When a bank unexpectedly ends a day with excess reserves, it will try to offset them by running balances below required reserve levels on other days. If its required reserve balance is high, it will simply aim for a low balance each day until it has worked off the accumulated excess reserves.

If a bank's required reserve balance is low, however, efforts to run reserve balances below requirements will expose the bank to the risk of an overdraft from an unexpected late-day reserve outflow. Because it does not earn interest on excess reserves, the bank will try to keep reserve balances on subsequent days as low as possible, but they may not be low enough to work off the excess reserves accumulated earlier. The bank's efforts to achieve low balances may require it to either buy or sell Federal funds very late in the day as it adjusts to surprises in its reserve picture. It may face a thin funds market at that time, which may adversely influence the rate it can earn or has to pay. Occasionally, the adjustment may not be possible, and the bank will either be stuck with excess reserves or be potentially overdrawn and have to go to the discount window to cover the overdraft.

Required reserve balances first reached exceptionally low levels in 1984. Member bank requirements had been fully phased down under the Monetary Control Act, but nonmember bank requirements had only been phased up halfway. In addition, vault cash holdings were expanding rapidly as the use of automated teller machines was spreading (Chart 2). Balances were

Chart 2. **Composition of Total Reserves**
Quarterly averages



Source: Board of Governors of the Federal Reserve System.

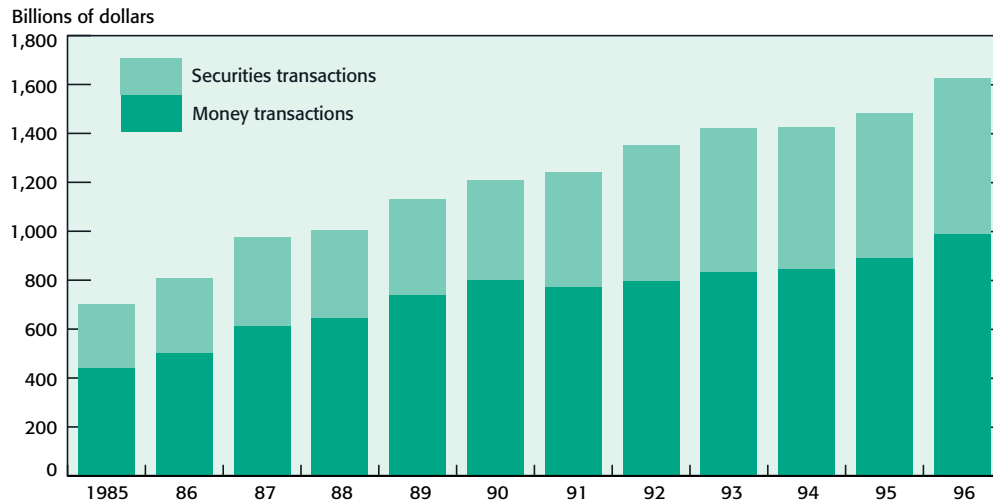
Note: Data are not seasonally adjusted or adjusted for reserve requirement changes.

rebuilt later in the 1980s, helped by the completion of the phase-in of nonmember bank requirements. Required reserve balances next dipped sharply early in 1991 after the Board of Governors eliminated reserve requirements on nontransaction deposits in two steps, one at the end of 1990 and one at the start of 1991. Balances experienced a more modest decline following the Board's 1992 reduction in maximum transaction deposit requirements from 12 percent to 10 percent. Rapid growth in M1 helped lift required reserve balances once again in the early 1990s. In addition, in the 1990s, large banks began to open required clearing balances (described in Box A), which lifted the level of operating balances that banks needed to hold.

Especially during the early 1991 interval, excess reserves temporarily rose on average and became more variable as daily clearing needs came to dominate banks' demands for reserve balances. Both the intraday and interday volatility of the Federal funds rate rose appreciably during that episode. In 1995-96, sweep accounts took required reserve balances to low levels again. So far, the impact on excess reserves and on funds rate volatility has been modest, possibly because the reductions in requirements came at the banks' initiative and because the declines have been gradual.

Low reserve balances can lead to reserve management difficulties because the volume of reserve transfers is very high (as noted in Chapter 3). Fedwire money transactions in 1996 averaged around \$990 billion a day and securities transactions averaged about \$640 billion (Chart 3). Offline check settlements averaged about \$48 billion and Automated Clearing House (ACH) transfers, which are preauthorized electronic payments, averaged almost \$38 billion. These daily transactions totaled \$1.7 trillion—about 75 times the average \$22.5 billion end-of-day reserve balance. Thus, the balances in the reserve accounts are intensively used. As discussed in Chapter 3, this heavy volume of transactions often contributes to some banks’ reserve accounts being overdrawn during part of the day. Such daylight overdrafts are subject to size restrictions and fees. By day’s end, banks must cover all overdrafts or face significant penalties, even if they have already met their reserve requirement for the period.⁶

Chart 3. Systemwide Fedwire Activity
Daily Averages



Source: Federal Reserve Bank of New York.

3. Combining Estimates to Form the Nonborrowed Reserve Path

The projection staffs add their estimated demands for required reserves to the assumed allowance for excess reserves to obtain estimated demands for total reserves. From that, they subtract the Desk officials' estimate of likely borrowed reserves (recently consisting mostly of seasonal borrowing) to form tentative nonborrowed reserve paths. The exercise is undertaken for the current and two subsequent maintenance periods. Staff members update the nonborrowed reserve path during a maintenance period as required reserve estimates are revised to keep the objective closely aligned with bank demands for reserves. As indicated above, Desk officials make informal revisions when excess reserve estimates deviate from the initial assumption. Typically, informal adjustments are also made when borrowing is expected to deviate from the path allowance.

Estimating Reserve Availability

Once the Desk has an objective for nonborrowed reserves for the two-week reserve maintenance period, it must develop a strategy for bringing actual nonborrowed reserves into line with that objective. The first step is to estimate the level of nonborrowed reserves for the current and future periods. The nonborrowed reserves arising from past open market operations will be known. Some of those arising from other balance-sheet items, however, are subject to considerable period-to-period or even day-to-day variation and change in ways that are hard to forecast (Box B).⁷ The Desk undertakes a substantial share of open market operations to offset the unwanted reserve impact of swings in these factors.

Each morning, members of the New York Fed's monetary projection staff present to the Desk their estimates of the likely behavior of the factors affecting reserves. Their counterparts at the Board perform a similar exercise to provide the Desk with a second set of estimates. As information flows in, projection staff members learn the actual values of the factors on the previous day and what developments may affect these factors on the current day and in the future. They interpret any deviations from the factors' expected behavior and decide how to modify their forecasts. These forecasts form the basis of the estimate of reserve supplies. They will be compared with the reserve paths in developing a plan for carrying out policy operations. (A more detailed description of the daily procedures for implementing monetary policy appears in Chapter 7.)

The Banking System's Responses to Federal Reserve Actions

The response of the banks and the public to policy actions will depend upon many circumstances, including the underlying institutional and regulatory structure described in Chapter 3. The adjustment process is inevitably complex in view of the large number and variety of financial institutions in the United States that create reservable deposit liabilities. How a particular action will affect money, credit, and interest rates can be described in general terms, but the magnitude and timing of the responses to a monetary policy action can only be estimated roughly at best.

1. Changes in the Federal Funds Rate Target

When the funds rate target is raised or lowered, banks have an incentive to adjust the pricing of loans and deposits. These adjustments will gradually work to alter money and credit growth. Banks may reevaluate the structure of their lending rates, as well as their deposit rates' competitive position relative to rates on market instruments. In the current environment, with unrestricted interest rates on all but demand deposits, banks have considerable flexibility to adjust rates, but their actions have tended to lag the markets. Thus, M2 and M3 generally weaken in the months after a restrictive policy action as market rates rise more rapidly than deposit rates. Once the rate adjustments are complete, the aggregates should partially recover. M1 growth, affected by continued rate restrictions on some types of deposits and very slow adjustment of consumer transaction deposit account rates by banks, will likely be held down for a more extended period. The details of how banks adjust to a change in reserve provision will vary according to initial conditions and expectations.

The public's response to a change in policy will arise from whatever steps the banks take to adapt their pricing of deposits and loans and from the public's perception of future interest rate developments. For instance, if banks raise their rates on loans, customers may cut back on their use of bank credit: they may substitute other, less costly types of credit, reduce their overall dependence on credit, or reduce their spending. However, if customers expect this rise to be the first of many increases in interest rates, borrowers may rush to get fixed-rate loans before they become even more expensive, thus initially accelerating, rather than reducing, loan demand and related deposit expansion. (This topic is explored in Chapter 8.)

2. Banks' Adjustments to Changes in Reserve Provision

The impact of a change in reserves through open market operations works its way quickly from the handful of banks that participated in the operation to the entire banking system. If the Desk buys Treasury securities, for instance, the sellers' banks will initially gain reserves. Those reserves will quickly be distributed to other banks as the customers spend the receipts or as the recipient banks attempt to work off a surplus (relative to their initial positions). The resulting reserves will thus quickly shift from the banks of firms participating in the open market operation to other banks.

Within a single two-week reserve maintenance period, the banking system's options for addressing a reserve excess or shortage are more limited than those of individual banks, which may take steps that merely redistribute the reserve shortages and excesses. As indicated in Chapter 3, a bank can adjust to a reserve shortage by selling assets such as short-term securities or loans, it can bid for wholesale deposits such as large CDs or Eurodollars, or it can purchase reserves from other banks in the overnight funding markets. None of these actions increases the total reserves of the banking system, but all of them redistribute the shortage.

In principle, banks could reduce their aggregate demand for reserves. They could lower their required reserves by reducing transaction deposits. To this end, banks could increase lending rates and lower transaction deposit rates, thereby encouraging customers to reduce loans and deposits.⁸ Such prompt adjustments by many banks and by their customers, however, are unlikely. Changes in deposits and lending rates are not generally made in response to what is perceived to be a temporary reserve imbalance. Even if the changes were made, customers would need time to respond to them. Cutting back on excess reserve holdings is also a theoretical option but, as indicated in Box A, banks are already devoting considerable resources to holding down excess reserves.

In practice, banks and their customers will initially follow the strategies that redistribute reserves—strategies that may change the Federal funds rate. As the funds rate rises or falls, the Desk may respond by providing more or less nonborrowed reserves. Otherwise, in the end, the adjustment will occur at the discount window.

Box A**Description of Reserve Measures****Total Reserves**

Total reserves are defined as reserve balances held at day's end at the Federal Reserve and applied vault cash (described below).⁹ Banks must hold total reserves to meet reserve requirements, specified as averages of closing balances held over two-week reserve maintenance periods that end every other Wednesday.¹⁰ Applied vault cash is defined as that portion of banks' total currency that is used to meet reserve requirements. The vault cash applied during a two-week reserve maintenance period was held during a two-week computation period that ended on a Monday, three days before the reserve maintenance period began. Almost all small depository institutions and some of the larger banks and other institutions routinely hold more than enough vault cash to meet their reserve requirement. They are referred to as "nonbound." Applied vault cash for those institutions is equal to their required reserves. Their total vault cash is reported to the Federal Reserve early in the reserve maintenance period, but the portion applied to meeting reserve requirements cannot be computed until after the reserve maintenance period ends and their reserve requirement is known.

Surplus vault cash—the excess of total over applied vault cash—is excluded from the various reserve measures. It arises because banks base their holdings of vault cash on expectations of customer demand rather than reserve requirements. Many banks have found that they need more cash for conducting business than for meeting requirements. In particular, widespread use of automated teller machines led banks to expand their vault cash holdings.¹¹ On average over 1996, applied vault cash amounted to about \$37 billion while surplus vault cash was \$5.4 billion. The decision to exclude surplus vault cash from the definitions of total (and excess) reserves was made because banks cannot directly use it to make reserve adjustments during a maintenance period.

Banks that do not hold sufficient vault cash to satisfy their entire reserve requirement are referred to as "bound," and they must hold reserve balances at their Federal Reserve Bank to meet the remaining portion of their requirement. Reserve balances also provide the means for transferring funds among banks. As checks clear through the Federal Reserve Banks, reserve balances flow from the paying bank's account to the receiving bank's account. Private clearing services also clear checks and arrange for the net settlement among reserve accounts. Many of these transactions occur when a bank directs the Federal Reserve to make a wire transfer for itself or a customer to another bank or its customer over the Fedwire system. ACH instructions also direct the transfer of reserve balances. Securities of the Treasury and some federal agencies are held in book-entry form at the Federal Reserve and are transferred through Fedwire. Settlement occurs using reserve balances.

Required Reserves

Reserve requirements can be satisfied by holding either or both of the two forms of total reserves—vault cash from the preceding computation period and end-of-day reserve balances at the Federal Reserve. The latter are often referred to as required reserve balances. Banks must come close to meeting their requirements on average over a two-week maintenance period; they are allowed to carry forward for one maintenance period an excess or deficiency of up to 4 percent of their requirements, or \$50,000, whichever is greater.¹² Once these carryovers are taken

Box A (Continued)

into account, a bank that fails to meet its requirement will be assessed a penalty on the deficiency at a rate that is 2 percentage points above the basic discount rate (although the penalty may be waived if there are extenuating circumstances). If a bank frequently fails to meet its requirements, the Federal Reserve will contact senior management to discuss the problem and remind them that repeated failure to comply with this important obligation would put the institution under scrutiny.

Reserve requirements, as specified in Federal Reserve Regulation D, are computed as various fractions of transaction deposits. The Board of Governors establishes requirements in conformity with rules and guidelines specified in the Depository Institutions Deregulation and Monetary Control Act of 1980 (MCA) and the Garn-St Germain Depository Institutions Act of 1982.¹³ For required reserves against transaction deposits, the computation period is the two weeks ending on the Monday two days before the maintenance period ends.¹⁴ Thus, neither the banks nor the Fed know the level of required reserves until very late in the maintenance period.¹⁵

Excess Reserves

Excess reserves are defined as total reserves not used to meet reserve requirements. Because surplus vault cash is excluded from the definition of total reserves, all excess reserves take the form of reserve balances at the Fed. Excess reserves arise because banks that use reserve balances for clearing purposes do not have perfect control over the level of those balances. They hold excess reserves when they estimate the cost of eliminating them to be greater than the interest lost by holding nonearning reserve balances. Banks that meet most or all of their reserve requirements with vault cash may hire a correspondent to process their transactions. Most of those banks would not hold reserve balances on their own and would thus not hold excess reserves.

Banks that do maintain reserve balances at the Federal Reserve are under an obligation to avoid end-of-day overdrafts.¹⁶ All large banks maintain reserve accounts. They devote considerable resources to monitoring reserve and deposit flows so as to avoid reserve deficiency penalties while trying to avoid unusable excess reserves. Most of these banks have required reserves plus required clearing balances (defined below) high enough to keep excess reserve levels within the band established by their carryover allowance much of the time. Because excess reserves are measured before taking account of carryover amounts, these banks often hold excesses and deficiencies in alternate maintenance periods. From their perspective, they are not holding either excesses or deficiencies because they include the carryover in their own calculations.¹⁷ Occasionally, around quarter ends or at other times when reserve flows are particularly hard to predict, large banks may have excess reserves that exceed their carryover limits, or they may waste excess reserves carried into the period.

Most small- and medium-sized commercial banks and thrift institutions and a few large banks are nonbound or close to it. If they clear for themselves, the flows through their reserve accounts each day are large compared with the small-to-nonexistent amount of reserve balances needed to meet requirements. These institutions can open required clearing balance accounts (described below), but those balances may not be large enough to cover their clearing needs. For them, it often costs less to hold reserve balances in excess of requirements than to engage in the close management of reserve positions necessary to eliminate excess reserves.

Box A (Continued)

Excess reserves grew during the 1980s (Chart 1, in the main text) after the MCA and the International Banking Act of 1978 mandated that reserve requirements be extended gradually to more institutions.¹⁸ As reserve requirements were phased in, some of these institutions became subject to reserve requirements in excess of vault cash. They opened reserve accounts to meet requirements and to provide funds for clearing through the Federal Reserve. For the first time, they were in a position to hold excess reserves as measured by the Federal Reserve. Excess reserves were then reasonably trendless, except for a spike in early 1991 after the large reduction in reserve ratios (discussed in the main text, section 2B).

Required Clearing Balances

The MCA anticipated that some small commercial banks and thrifts would have difficulties handling settlement of interbank transactions without either holding excess reserves or being overdrawn. It provided that institutions routinely needing reserve balances for clearing purposes—either because their required reserve balances at the Federal Reserve were low or because vault cash fully met requirements—could establish so-called required clearing balances. A bank may negotiate with its Reserve Bank the amount of reserve balances it expects to need for clearing and commit to holding that amount on average. The Federal Reserve then compensates the institutions for those balances in the form of credits to cover fees for priced services. The value of the credits is computed from the average Federal funds rate during the maintenance period in which the balances are held. The maximum required clearing balance that offers a return is determined by the amount of priced Federal Reserve services the bank uses and by the level of the Federal funds rate. (The credits are good for a year after they are earned.) Often, the maximum useful level of credits is below the reserve balance needed to avoid holding excess reserves. Many small banks and thrifts have chosen not to establish required clearing balances because doing so would entail paying increased attention to reserve management.

Large banks became active users of required clearing balances beginning in 1991 after the reserve requirement reductions caused many of them to need more reserve balances to protect against overnight overdrafts than they needed to meet requirements. As a result, the amount of required clearing balances climbed dramatically. Balances then dipped in 1994, when rising Federal funds rates reduced the volume of clearing balances needed to cover the cost of services purchased. Balances climbed again in 1995 and 1996, as sweep accounts spread and required reserve balances fell (Chart 4). Required clearing balances are not treated as part of total reserves (or excess reserves). In its analysis of banks' reserve management strategies and its assessment of the risk of overdrafts, the Federal Reserve focuses informally on required operating balances, which consist of required reserve balances plus required clearing balances.

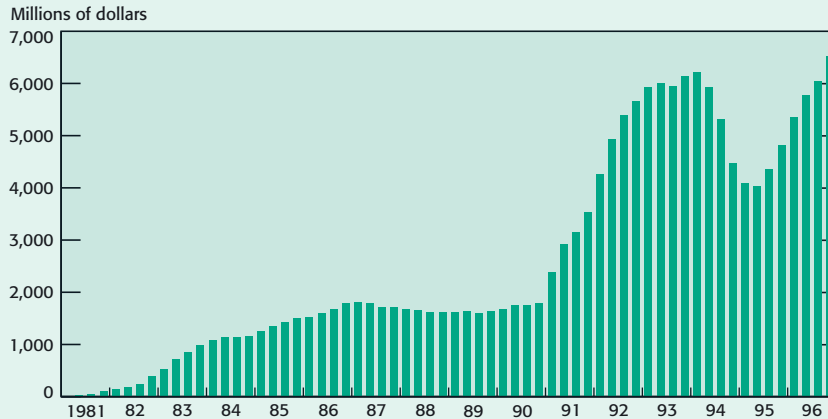
Borrowed Reserves

Three basic types of collateralized credit—adjustment credit, seasonal credit, and extended credit—may be made available to banks and other depository institutions at the discount window.

Adjustment Credit. A bank can use adjustment credit when it comes up short in its efforts to meet its reserve requirement or when it would otherwise run an overnight overdraft. Banks are instructed to make a good-faith effort to

Box A (Continued)

Chart 4. **Required Clearing Balances**
Quarterly Averages



Source: Board of Governors of the Federal Reserve System.

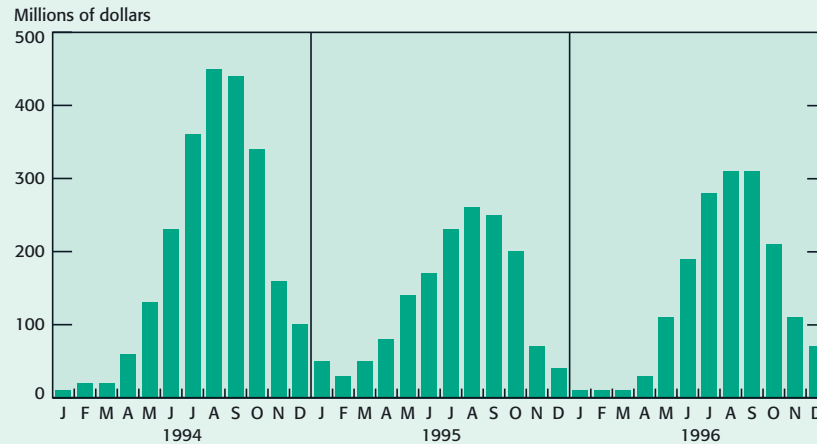
obtain the reserves from other sources before borrowing from the discount window; they could, for example, attempt to purchase Federal funds from another bank as long as they discover the need before Fedwire closes at 6:30 p.m. eastern time. (Banks can borrow at the discount window for a few hours after Fedwire has closed.) The Federal Reserve extends adjustment credit for one or at most a few business days at the basic discount rate and discourages prolonged or frequent use. Thus, when a reserve shortage forces borrowing to rise sharply, the Federal funds rate is likely to rise as well because of the banks' efforts to obtain reserves from other sources. Banks also must demonstrate that they are not relending the borrowed funds to other banks. Banks and thrift institutions eligible to borrow from a Federal Home Loan Bank may also use adjustment credit, but normally they would meet anticipated needs through Federal Home Loan Bank advances. Adjustment borrowing is generally subject to the basic discount rate established by the Reserve Banks' Boards of Directors and approved by the Board of Governors.¹⁹

Seasonal Credit. Under the seasonal borrowing program, small banks with a significant seasonal pattern to their lending can borrow modest amounts for a more lengthy period during that portion of the year when their lending is regularly high. Indeed, this borrowing has a strong seasonal pattern because many users are agricultural area banks that face their greatest credit demands over the spring and summer (Chart 5). Because these banks are small, the Federal Reserve assumes that they have limited access to funds in the national money markets. If the bank is eligible to use the program at that time of year, the discount window officers will not require the same justifications that apply to requests for adjustment borrowing.

Since 1992, the discount rate charged for seasonal borrowing has been linked to monthly average Federal funds and certificate of deposit rates, with

Box A (Continued)

Chart 5. Seasonal Borrowing



Source: Board of Governors of the Federal Reserve System.

the basic discount rate serving as a floor. Consequently, incentives to use seasonal borrowing no longer vary with spreads between the funds rate and the basic discount rate. Nonetheless, seasonal borrowing shows some cyclical variation, rising in years when credit demands are particularly strong.

Extended Credit. Extended credit borrowing represents loans to depository institutions experiencing unusual financial difficulties. An institution in this program generally is unable to borrow additional funds from normal market sources. Hence, its dependence on Federal Reserve credit is likely to last until its basic problems are resolved—for example, through an acquisition, an infusion of additional capital, its closure, or some other action by its insurer. While in the program, banks are permitted to borrow without the normal pressures to repay promptly. Soon after the borrowing begins, the interest rate is set 50 basis points above the market-based discount rate charged for seasonal borrowing, making the cost to the troubled institution slightly higher than prevailing market rates.

Since the last heavy use of the program, in 1990, legislation has imposed some limitations. Legislators were concerned that a failing institution might be kept open by Federal Reserve credit for a prolonged period. While it remained open, losses could grow while uninsured depositors could flee, thus increasing potential burdens to the insurance system or the taxpayers. Therefore, under the Federal Deposit Insurance Corporation Improvement Act of 1994 (FDICIA), the Federal Reserve is encouraged to limit the length of such loans.²⁰

For reserve path purposes, adjustment and seasonal credit together constitute borrowed reserves. Extended credit borrowing was not included in the path level of borrowing because of its special characteristics. The choices were made when borrowing was playing a bigger role in the policy process. Adjustment credit borrowing was included in the borrowed reserve measure because it was related to the spread between the Federal funds rate and the

Box A (*Continued*)

discount rate. Limitations on banks' use of this type of credit forced the Federal funds rate to rise until the discount window alleviated the reserve shortage. Seasonal borrowing was included because it had seemed to respond to changes in reserve pressures in a fashion similar to adjustment credit. (At the time, it was subject to the basic discount rate, so spreads to market rates varied along with those on adjustment borrowing.) For a number of years, no clear seasonal pattern to the sum of adjustment and seasonal borrowing was evident, despite the strong pattern to seasonal borrowing, apparently because adjustment borrowing was dominant. Beginning in the late 1980s, however, seasonal borrowing has often constituted a large share of the total, and its seasonal pattern has shown through to the combined measure.

Nonborrowed Reserves

Nonborrowed reserves can most easily be described as the portion of total reserves provided to depository institutions through any means other than the discount window. Past open market operations, which will have established the size of the System's portfolio of Treasury and federal agency securities, are the primary source of nonborrowed reserves. However, nonborrowed reserves can also be provided or absorbed by a number of factors besides changes in the portfolio. Most of these consist of Federal Reserve balance-sheet items not under direct Federal Reserve control (Box B). The formal definition of nonborrowed reserves does not include extended credit borrowing, although the definition used for reserve path construction does.

Box B**Forecasting Factors Affecting Reserves****Currency**

Over time, currency demands represent the largest net drain on reserves of any of the factors and have been responsible for much of the growth in the System's portfolio of government securities. Banks replenish currency holdings to handle cash withdrawals by obtaining currency from the Federal Reserve. The Fed debits the banks' reserve accounts. When banks acquire more currency than they wish to hold, they return the excess to the Federal Reserve and receive a credit to their reserve account. To keep reserve balances from falling or rising as a result of the currency withdrawals and returns, the Federal Reserve would normally adjust reserves through open market purchases or sales of government securities unless some other factor was providing an offsetting add to or drain of reserves.

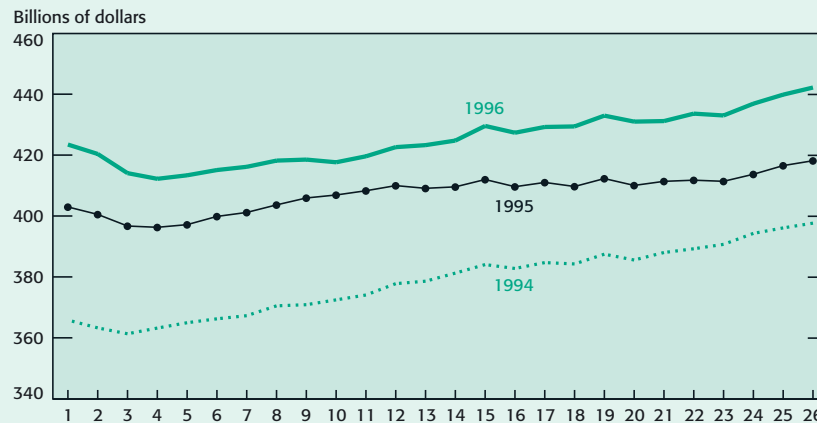
Part of the upward trend to currency reflects the nominal expansion of domestic economic activity. Credit cards and other electronic means of payment have reduced the amount of currency needed for a given volume of payments, but the spread of automated teller machines has increased currency use for transactions. A large portion of the currency growth in the last decade or more, however, has reflected demand for use abroad. Some countries' residents seek U.S. dollars because of bad experiences with inflation in their home currency or lack of confidence in the local government. Sometimes U.S. dollars have been acquired mostly as a store of value, while in other cases they have also been used for local transactions. Some demand seems to come from countries whose own currency is considered stable. Apparently, that demand arises because of the international nature of the U.S. dollar more generally, a topic described in Chapter 9.

The heavy use of currency abroad provides valuable seigniorage revenues to the Treasury, but it has complicated the process of forecasting currency changes.²¹ Those demands have not followed any clear-cut patterns either in terms of average growth rates or short-term variation. They have sometimes obscured the short-term repetitive patterns in the domestic figures and have made forecasting more difficult. Nonetheless, some patterns can still be observed that arise from regularities in payments and receipts and from seasonal variation in currency use (Chart 6). For instance, the demand for currency rises during the summer vacation travel period and around major holidays.

Treasury Cash Balances

Although the Treasury's balance at the Federal Reserve changes little over the year as a whole, it is the reserve factor that shows the most variation from one reserve maintenance period to another. Increases in the Treasury's cash balance at the Federal Reserve absorb reserves since they involve a transfer of funds from the banking system to the Federal Reserve, while declines in the Treasury's balance provide reserves to the banks. The Treasury attempts to keep a steady working balance at the Federal Reserve for making its payments,²² and it places additional cash in so-called Treasury tax and loan note option, or TT&L, accounts at depository institutions that have agreed to accept them.²³ Each morning, the Treasury, the New York Reserve Bank, and the Board staffs evaluate the estimated flows through the Treasury's Fed account. The Treasury may decide to transfer funds to the Fed by making a "call" on the TT&L accounts if estimates suggest its balance would otherwise be below the target balance or to transfer funds to the TT&L accounts by making a "direct investment" to the accounts if the estimated balance would otherwise be higher than desired.²⁴

Box B (Continued)

Chart 6. **Currency in Circulation**
Maintenance Period Averages

Source: Board of Governors of the Federal Reserve System.

Note: Data are not seasonally adjusted.

The banks must pay interest on the TT&L accounts at a rate one quarter of a percentage point below the weekly average Federal funds rate and must hold collateral against them. Because of these requirements, the participating banks place caps on the amount of Treasury balances they will accept. At times when the Treasury is particularly flush with cash, such as after some of the major tax dates—those in the middle of January, April, June, and September—its cash balances may exceed the capacity of the TT&L accounts to a considerable degree. The excess cash will lift the balance at the Federal Reserve (Chart 7).²⁵ As the funds flow from the commercial banks to the Fed, they drain reserves. Once the Treasury spends the money, the Treasury's balance at the Fed falls back to normal levels, adding to reserves.

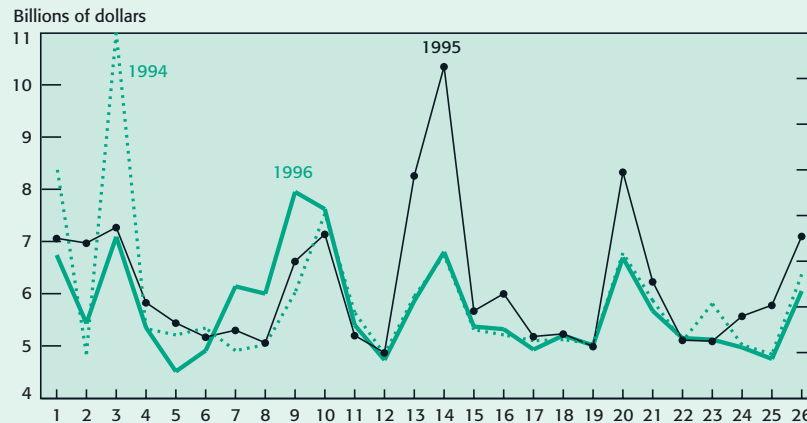
Errors occur in the day-to-day forecasts of the Treasury balance because it is not possible to estimate precisely the level or timing of the myriad receipts and expenditures of the federal government. Most of the time, a single day's error has only a modest effect on the average level of nonborrowed reserves over the two-week reserve maintenance period because the Treasury will adjust the size of the next day's call or direct investment in order to bring the balance back to the normal target level. When total Treasury cash exceeds the capacity of the TT&L accounts, however, unexpected changes in flows, such as higher or lower receipts than forecast, will affect the level of the Treasury's balance at the Federal Reserve not just for a day or two but until the total cash balance drops below the TT&L capacity again, a development that may take a couple of weeks. The resulting reserve effect will be magnified.

Federal Reserve Float

Federal Reserve float is generated when checks are processed more slowly than specified in a preset schedule for crediting the banks presenting the checks. When the presenting bank's reserve account is credited before a corresponding debit is made to the account of the bank on which the checks are drawn, two banks will

Box B (Continued)

Chart 7. **Treasury Balances at Federal Reserve Banks**
Maintenance Period Averages



Source: Board of Governors of the Federal Reserve System.

simultaneously have the same reserves credited to their respective accounts. Thus, float is a source of reserves. Float declined dramatically in the early 1980s because the Fed worked to discourage it under the terms of the MCA (Chart 8). In 1983, the Federal Reserve started charging the banks explicitly for the float they generate.

Float has become more predictable as forecasters have gathered more information about delivery and processing of checks. Nevertheless, float occasionally jumps unexpectedly—most commonly when bad weather interrupts normal check delivery (Chart 9). Interruptions to the Fed's wire transfer system can also create or reduce float. Errors introduced by incomplete or misdirected wire transfers are corrected afterward with so-called as-of adjustments. If the problem is not completely resolved before the end of the maintenance period, the adjustment may be made in a later period, thus affecting each period's reserve availability. Efforts have been made to minimize the unpredictable component of as-of adjustments.

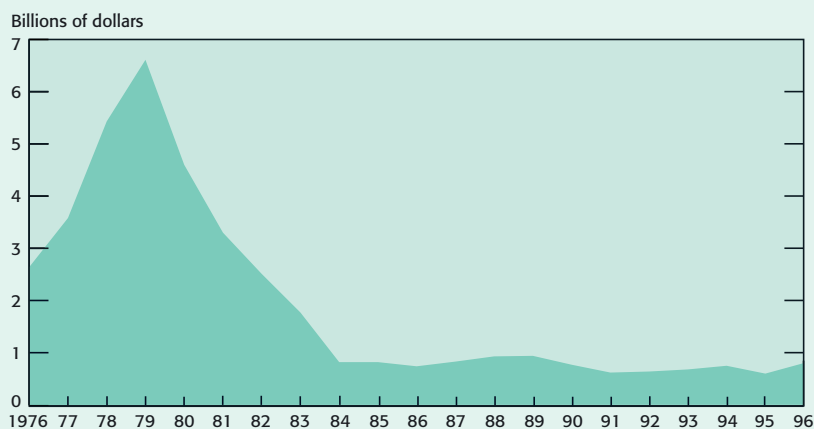
Foreign Exchange Intervention

In the United States, foreign exchange transactions are not undertaken for the purpose of affecting reserves. Nonetheless, foreign exchange developments can change reserve levels. Those effects must be considered along with other market factors. When the Federal Reserve intervenes in the foreign exchange markets, it either buys dollars—draining reserves—or sells dollars—adding reserves. The reserve absorption or provision from the purchase or sale of dollars usually occurs two business days after the intervention. Generally, intervention is arranged on behalf of both the Federal Reserve and the Treasury. The Federal Reserve's portion of the intervention will add or drain reserves when the payments are made.²⁶

The reserve impact of the Treasury portion will depend upon how the Treasury pays for its intervention. If the Treasury follows its standard procedure and pays out either dollars or foreign currencies from the Exchange Stabilization

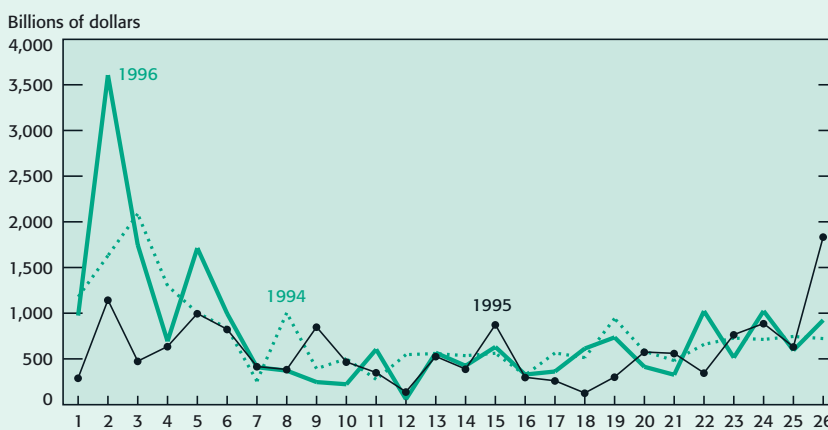
Box B (Continued)

Chart 8. **Annual Average Federal Reserve Float**



Source: Board of Governors of the Federal Reserve System.

Chart 9. **Federal Reserve Float Maintenance Period Averages**



Source: Board of Governors of the Federal Reserve System.

Fund (ESF), the intervention will generally have no reserve impact. The potential injection or withdrawal of dollars will be offset by adjustments to the size of the call or direct investment made by the Treasury. (When the TT&L accounts are at capacity, however, the intervention will change the Treasury’s Federal Reserve balance and therefore will affect reserves until the TT&L balances fall back below capacity.) Occasionally, the ESF does not have sufficient dollars available to cover a sale. In that circumstance, it may issue Special Drawing Right (SDR) certificates to the Federal Reserve against SDRs obtained from the International Monetary Fund. This “monetization” of SDRs adds reserves. If the Treasury acquires dollars from

Box B (Continued)

the Federal Reserve by placing foreign currencies with the Fed (with an agreement to buy them back at the same exchange rate) in what is known as a warehousing transaction, the warehousing will add reserves as the Treasury pays out the funds.²⁷ The Treasury will reduce its TT&L calls when it receives funds from an SDR certificate monetization or warehousing that exceeds its immediate intervention needs.

Reserve levels are also affected by the monthly revaluation of Federal Reserve holdings of foreign currencies to reflect changes in exchange rates. The Federal Reserve recognizes income from this source when the foreign exchange value of its foreign currency balances appreciates. The Fed remits this income to the Treasury each week, allowing the Treasury to call in less cash from the banks. Losses are recognized when the Fed's foreign currency balances depreciate in value, thus reducing the Fed's weekly payments to the Treasury and increasing the need for TT&L calls. (If losses on foreign currency holdings exceed the week's profits from earnings on the securities portfolio, the Federal Reserve will make no payment to the Treasury until the losses have been covered.)

Transactions by Foreign Official Institutions

Many foreign central banks hold demand deposits at the Federal Reserve for execution of various dollar-denominated transactions. Transfers of funds into these accounts from commercial banks drain reserves. Because the central banks are not paid interest on these demand deposits, however, they try to keep them down to an essentially steady working balance. The ultimate reserve effect of an inflow of dollars to a central bank account depends on how the central bank invests the receipts. If the funds stay within the Federal Reserve, the inflow drains reserves. The most common way for the funds to stay within the Fed is for the foreign account to arrange a repurchase agreement (RP) on which it earns interest, with the Fed acting as counterparty. From the Federal Reserve's perspective, this transaction is a matched sale-purchase agreement (MSP). The Fed arranges MSPs with the foreign accounts when their cash buildup is expected to be temporary. The reserve forecasts routinely allow for the drain from the inflow of funds to the Federal Reserve and their arrangement as MSPs, since they occur every business day. Hence, on those occasions when the Desk passes through part of the foreign investment orders to the market as customer-related RPs, the RPs, in a sense, add reserves since the drain has already been factored into the assumptions about reserve levels. The Desk must estimate how large the foreign RP orders will be in the coming days. Although the central banks attempt to predict large flows into or out of their accounts, their estimates are often wide of the mark. Unexpected variations in the flow of central bank RP orders can cause errors in the reserve forecasts.

If a central bank expects a rise or fall in its cash holdings to persist, it may ask the Federal Reserve to make an outright purchase or sale of Treasury securities on its behalf. In contrast to the RP orders, these operations are routinely arranged in the market. If payment for these transactions comes into the Federal Reserve and flows out again on the same day, there is no reserve impact. At times, the Desk will be the counterparty to these transactions if they serve its reserve management needs. In these situations, the transactions will have the same reserve impact as an outright purchase or sale in the market, discussed in Chapter 7.

Box B (*Continued*)

Other Factors

Also affecting reserves are a number of other balance-sheet items such as interest accruals and remittances of profits to the Treasury. For the most part, however, forecasting these factors is reasonably straightforward. Gold holdings of the Federal Reserve affect reserves, but the volume of reserves would change only if the Treasury altered the amount of certificates issued to the Federal Reserve because its gold holdings changed or if the official price of gold was changed. Occasionally, the Treasury makes small adjustments to the certificates outstanding, reflecting transactions that affect its gold holdings. As of December 1996, the Federal Reserve held certificates representing almost 262 million troy ounces of gold, worth about \$11.05 billion at the official price of \$42 2/9 per troy ounce. (The price was last changed in 1973.)