Bank Reserves—How They Change

Money has been defined as the sum of transaction accounts in depository institutions, and currency and travelers checks in the hands of the public. Currency is something almost everyone uses every day. Therefore, when most people think of money, they think of currency. Contrary to this popular impression, however, ***transaction deposits*** are the most significant part of the money stock. People keep enough currency on hand to effect small face-to-face transactions, but they write checks to cover most large expenditures. Most businesses probably hold even smaller amounts of currency in relation to their total transactions than do individuals.

Since the most important component of money is transaction deposits, and since these deposits must be supported by reserves, the central bank's influence over money hinges on its control over the total amount of reserves and the conditions under which banks can obtain them.

The preceding illustrations of the expansion and contraction processes have demonstrated how the central bank, by purchasing and selling government securities, can deliberately change aggregate bank reserves in order to affect deposits. But open market operations are only one of a number of kinds of transactions or developments that cause changes in reserves. Some changes originate from actions taken by the public, by the Treasury Department, by the banks, or by foreign and international institutions. Other changes arise from the service functions and operating needs of the Reserve Banks themselves.

The various factors that provide and absorb bank reserve balances, together with symbols indicating the effects of these developments, are listed on the opposite page. This tabulation also indicates the nature of the balancing entries on the Federal Reserve's books. (To the extent that the impact is absorbed by changes in banks' vault cash, the Federal Reserve's books are unaffected.)

Independent Factors Versus Policy Action

It is apparent that bank reserves are affected in several ways that are independent of the control of the central bank. Most of these "independent" elements are changing more or less continually. Sometimes their effects may last only a day or two before being reversed automatically. This happens, for instance, when bad weather slows up the check collection process, giving rise to an automatic increase in Federal Reserve credit in the form of "float." Other influences, such as changes in the public's currency holdings, may persist for longer periods of time.

Still other variations in bank reserves result solely from the mechanics of institutional arrangements among the Treasury, the Federal Reserve Banks, and the depository institutions. The Treasury, for example, keeps part of its operating cash balance on deposit with banks. But virtually all disbursements are made from its balance in the Reserve Banks. As is shown later, any buildup in balances at the Reserve Banks prior to expenditure by the Treasury causes a dollar-for-dollar drain on bank reserves.

In contrast to these independent elements that affect reserves are the policy actions taken by the Federal Reserve System. The way System open market purchases and sales of securities affect reserves has already been described. In addition, there are two other ways in which the System can affect bank reserves and potential deposit volume directly: first, through loans to depository institutions; and second, through changes in reserve requirement percentages. A change in the required reserve ratio, of course, does not alter the dollar volume of reserves directly but does change the amount of deposits that a given amount of reserves can support.

Any change in reserves, regardless of its origin, has the same potential to affect deposits. Therefore, in order to achieve the net reserve effects consistent with its monetary policy objectives, the Federal Reserve System continuously must take account of what the independent factors are doing to reserves and then, using its policy tools, offset or supplement them as the situation may require.

By far the largest number and amount of the System's gross open market transactions are undertaken to offset drains from or additions to bank reserves from non-Federal Reserve sources that might otherwise cause abrupt changes in credit availability. In addition, Federal Reserve purchases and/or sales of securities are made to provide the reserves needed to support the rate of money growth consistent with monetary policy objectives.

In this section of the booklet, several kinds of transactions that can have important week-to-week effects on bank reserves are traced in detail. Other factors that normally have only a small influence are described briefly on page 35.

Factors Changing Reserve Balances—Independent and Policy Actions

	FEDERAL RESERVE BANKS		
	Assets	**Liabilities**	
		Reserve balances	Other
Public actions			
Increase in currency holdings		-	+
Decrease in currency holdings		+	-
Treasury, bank, and foreign actions			
Increase in Treasury deposits in F.R. Banks		-	+
Decrease in Treasury deposits in F.R. Banks		+	-
Gold purchases (inflow) or increase in official valuation*		+	-
Gold sales (outflow)*		-	+
Increase in SDR certificates issued*		+	-
Decrease in SDR certificates issued*		-	+
Increase in Treasury currency outstanding*		+	-
Decrease in Treasury currency outstanding*		-	+
Increase in Treasury cash holdings*		-	+
Decrease in Treasury cash holdings*		+	-
Increase in service-related balances/adjustments		-	+
Decrease in service-related balances/adjustments		+	-
Increase in foreign and other deposits in F.R. Banks		-	+
Decrease in foreign and other deposits in F.R. Banks		+	-
Federal Reserve actions			
Purchases of securities	+	+	
Sales of securities	-	-	
Loans to depository institutions	+	+	
Repayment of loans to depository institutions	-	-	
Increase in Federal Reserve float	+	+	
Decrease in Federal Reserve float	-	-	
Increase in assets denominated in foreign currencies	+	+	
Decrease in assets denominated in foreign currencies	-	-	
Increase in other assets**	+	+	
Decrease in other assets**	-	-	
Increase in other liabilities**		-	+
Decrease in other liabilities**		+	-
Increase in capital accounts**		-	+
Decrease in capital accounts**		+	-
Increase in reserve requirements		-***	
Decrease in reserve requirements		+***	

* These factors represent assets and liabilities of the Treasury. Changes in them typically affect reserve balances through a related change in the Federal Reserve Banks' liability "Treasury deposits."

** Included in "Other Federal Reserve accounts" as described on page 35.

*** Effect on excess reserves. Total reserves are unchanged.

Note: To the extent that reserve changes are in the form of vault cash, Federal Reserve accounts are not affected.

Changes in the Amount of Currency Held by the Public

Changes in the amount of currency held by the public typically follow a fairly regular intramonthly pattern. Major changes also occur over holiday periods and during the Christmas shopping season — times when people find it convenient to keep more pocket money on hand. *(See chart.)* The public acquires currency from banks by cashing checks.[6] When deposits, which are fractional reserve money, are exchanged for currency, which is 100 percent reserve money, the banking system experiences a net reserve drain. Under the assumed 10 percent reserve requirement, a given amount of bank reserves can support deposits ten times as great, but when drawn upon to meet currency demand, the exchange is one to one. A $1 increase in currency uses up $1 of reserves.

Suppose a bank customer cashed a $100 check to obtain currency needed for a weekend holiday. Bank deposits decline $100 because the customer pays for the currency with a check on his or her transaction deposit; and the bank's currency (vault cash reserves) is also reduced $100. *See illustration 15.*

Now the bank has less currency. It may replenish its vault cash by ordering currency from its Federal Reserve Bank — making payment by authorizing a charge to its reserve account. On the Reserve Bank's books, the charge against the bank's reserve account is offset by an increase in the liability item "Federal Reserve notes." *See illustration 16.* The Reserve Bank shipment to the bank might consist, at least in part, of U.S. coins rather than Federal Reserve notes. All coins, as well as a small amount of paper currency still outstanding but no longer issued, are obligations of the Treasury. To the extent that shipments of cash to banks are in the form of coin, the offsetting entry on the Reserve Bank's books is a decline in its asset item "coin."

The public now has the same volume of money as before, except that more is in the form of currency and less is in the form of transaction deposits. Under a 10 percent reserve requirement, the amount of reserves required against the $100 of deposits was only $10, while a full $100 of reserves have been drained away by the disbursement of $100 in currency. Thus, if the bank had no excess reserves, the $100 withdrawal in currency causes a reserve deficiency of $90. Unless new reserves are provided from some other source, bank assets and deposits will have to be reduced (according to the contraction process described on pages 12 and 13) by an additional $900. At that point, the reserve deficiency caused by the cash withdrawal would be eliminated.

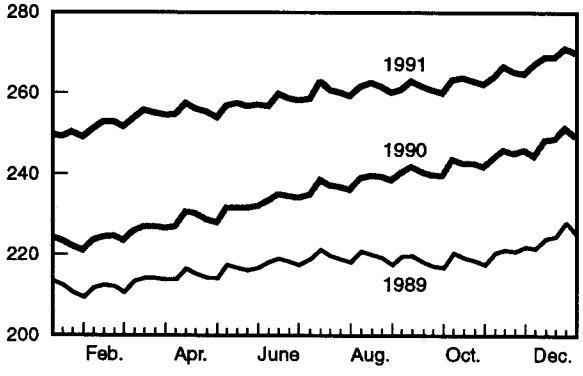
When Currency Returns to Banks, Reserves Rise

After holiday periods, currency returns to the banks. The customer who cashed a check to cover anticipated cash expenditures may later redeposit any currency still held that's beyond normal pocket money needs. Most of it probably will have changed hands, and it will be deposited by operators of motels, gasoline stations, restaurants, and retail stores. This process is exactly the reverse of the currency drain, except that the banks to which currency is returned may not be the same banks that paid it out. But in the aggregate, the banks gain reserves as 100 percent reserve money is converted back into fractional reserve money.

When $100 of currency is returned to the banks, deposits and vault cash are increased. *See illustration 17.* The banks can keep the currency as vault cash, which also counts as reserves. More likely, the currency will be shipped to the Reserve Banks. The Reserve Banks credit bank reserve accounts and reduce Federal Reserve note liabilities. *See illustration 18.* Since only $10 must be held against the new $100 in deposits, $90 is excess reserves and can give rise to $900 of additional deposits.[7]

To avoid multiple contraction or expansion of deposit money merely because the public wishes to change the composition of its money holdings, the effects of changes in the public's currency holdings on bank reserves normally are offset by System open market operations.

Currency held by the public
weekly averages, billions of dollars, not seasonally adjusted



[6]The same balance sheet entries apply whether the individual physically cashes a paper check or obtains currency by withdrawing cash through an automatic teller machine.

[7]Under current reserve accounting regulations, vault cash reserves are used to satisfy reserve requirements in a future maintenance period while reserve balances satisfy requirements in the current period. As a result, the impact on a bank's current reserve position may differ from that shown unless the bank restores its vault cash position in the current period via changes in its reserve balance.

15 When a depositor cashes a check, both deposits and vault cash reserves decline.

BANK A

Assets		Liabilities	
Vault cash reserves	-100	Deposits	-100
Required	*-10*		
Deficit	*90*		

16 If the bank replenishes its vault cash, its account at the Reserve Bank is drawn down in exchange for notes issued by the Federal Reserve.

FEDERAL RESERVE BANK

Assets	Liabilities	
	Reserve accounts: Bank A	-100
	F.R. notes	+100

BANK A

Assets		Liabilities	
Vault cash	+100		
Reserves with F.R. Banks	-100		

17 When currency comes back to the banks, both deposits and vault cash reserves rise.

BANK A

Assets		Liabilities	
Vault cash reserves	+100	Deposits	+100
Required	*+10*		
Excess	*+90*		

18 If the currency is returned to the Federal Reserve, reserve accounts are credited and Federal Reserve notes are taken out of circulation.

FEDERAL RESERVE BANK

Assets	Liabilities	
	Reserve accounts: Bank A	+100
	F.R. notes	-100

BANK A

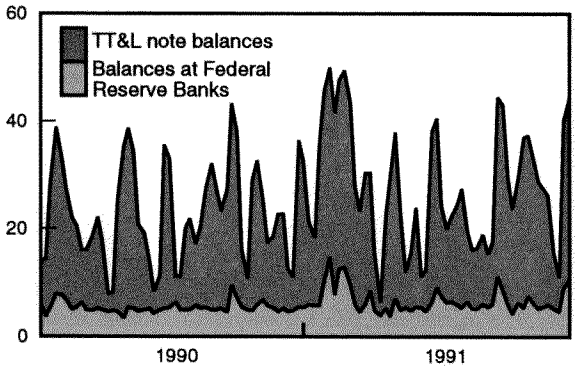
Assets		Liabilities	
Vault cash	-100		
Reserves with F.R. Banks	+100		

Changes in U.S. Treasury Deposits in Federal Reserve Banks

Reserve accounts of depository institutions constitute the bulk of the deposit liabilities of the Federal Reserve System. Other institutions, however, also maintain balances in the Federal Reserve Banks — mainly the U.S. Treasury, foreign central banks, and international financial institutions. In general, when these balances rise, bank reserves fall, and vice versa. This occurs because the funds used by these agencies to build up their deposits in the Reserve Banks ultimately come from deposits in banks. Conversely, recipients of payments from these agencies normally deposit the funds in banks. Through the collection process these banks receive credit to their reserve accounts.

The most important nonbank depositor is the U.S. Treasury. Part of the Treasury's operating cash balance is kept in the Federal Reserve Banks; the rest is held in depository institutions all over the country, in so-called "Treasury tax and loan" (TT&L) note accounts. *(See chart.)* Disbursements by the Treasury, however, are made against its balances at the Federal Reserve. Thus, transfers from banks to Federal Reserve Banks are made through regularly scheduled "calls" on TT&L balances to assure that sufficient funds are available to cover Treasury checks as they are presented for payment.[8]

Operating cash balance of the U.S. Treasury
weekly averages, billions of dollars, not seasonally adjusted



Bank Reserves Decline as the Treasury's Deposits at the Reserve Banks Increase

Calls on TT&L note accounts drain reserves from the banks by the full amount of the transfer as funds move from the TT&L balances (via charges to bank reserve accounts) to Treasury balances at the Reserve Banks. Because reserves are not required against TT&L note accounts, these transfers do not reduce required reserves.[9]

Suppose a Treasury call payable by Bank A amounts to $1,000. The Federal Reserve Banks are authorized to transfer the amount of the Treasury call from Bank A's reserve account at the Federal Reserve to the account of the U.S. Treasury at the Federal Reserve. As a result of the transfer, both reserves and TT&L note balances of the bank are reduced. On the books of the Reserve Bank, bank reserves decline and Treasury deposits rise. *See illustration 19.* This withdrawal of Treasury funds will cause a reserve deficiency of $1,000 since no reserves are released by the decline in TT&L note accounts at depository institutions.

Bank Reserves Rise as the Treasury's Deposits at the Reserve Banks Decline

As the Treasury makes expenditures, checks drawn on its balances in the Reserve Banks are paid to the public, and these funds find their way back to banks in the form of deposits. The banks receive reserve credit equal to the full amount of these deposits although the corresponding increase in their required reserves is only 10 percent of this amount.

Suppose a government employee deposits a $1,000 expense check in Bank A. The bank sends the check to its Federal Reserve Bank for collection. The Reserve Bank then credits Bank A's reserve account and charges the Treasury's account. As a result, the bank gains both reserves and deposits. While there is no change in the assets or total liabilities of the Reserve Banks, the funds drawn away from the Treasury's balances have been shifted to bank reserve accounts. *See illustration 20.*

One of the objectives of the TT&L note program, which requires depository institutions that want to hold Treasury funds for more than one day to pay interest on them, is to allow the Treasury to hold its balance at the Reserve Banks to the minimum consistent with current payment needs. By maintaining a fairly constant balance, large drains from or additions to bank reserves from wide swings in the Treasury's balance that would require extensive offsetting open market operations can be avoided. Nevertheless, there are still periods when these fluctuations have large reserve effects. In 1991, for example, week-to-week changes in Treasury deposits at the Reserve Banks averaged only $56 million, but ranged from -$4.15 billion to +$8.57 billion.

[8]When the Treasury's balance at the Federal Reserve rises above expected payment needs, the Treasury may place the excess funds in TT&L note accounts through a "direct investment." The accounting entries are the same, but of opposite signs, as those shown when funds are transferred from TT&L note accounts to Treasury deposits at the Fed.

[9]Tax payments received by institutions designated as Federal tax depositaries initially are credited to reservable demand deposits due to the U.S. government. Because such tax payments typically come from reservable transaction accounts, required reserves are not materially affected on this day. On the next business day, however, when these funds are placed either in a nonreservable note account or remitted to the Federal Reserve for credit to the Treasury's balance at the Fed, required reserves decline.

19 When the Treasury builds up its deposits at the Federal Reserve through "calls" on TT&L note balances, reserve accounts are reduced.

FEDERAL RESERVE BANK

Assets	Liabilities	
	Reserve accounts: Bank A	- 1,000
	U.S. Treasury deposits	+ 1,000

BANK A

Assets		Liabilities	
Reserves with F.R. Banks	- 1,000	Treasury tax and loan note account	- 1,000
Required	*0*		
Deficit	*1,000*		

20 Checks written on the Treasury's account at the Federal Reserve Bank are deposited in banks. As these are collected, banks receive credit to their reserve accounts at the Federal Reserve Banks.

FEDERAL RESERVE BANK

Assets	Liabilities	
	Reserve accounts: Bank A	+ 1,000
	U.S. Treasury deposits	- 1,000

BANK A

Assets		Liabilities	
Reserves with F.R. Banks	+ 1,000	Private deposits	+ 1,000
Required	*+100*		
Excess	*+900*		

Changes in Federal Reserve Float

A large proportion of checks drawn on banks and deposited in other banks is cleared (collected) through the Federal Reserve Banks. Some of these checks are credited immediately to the reserve accounts of the depositing banks and are collected the same day by debiting the reserve accounts of the banks on which the checks are drawn. All checks are credited to the accounts of the depositing banks according to availability schedules related to the time it normally takes the Federal Reserve to collect the checks, but rarely more than two business days after they are received at the Reserve Banks, even though they may not yet have been collected due to processing, transportation, or other delays.

The reserve credit given for checks not yet collected is included in Federal Reserve "float."[10] On the books of the Federal Reserve Banks, balance sheet float, or statement float as it is sometimes called, is the difference between the asset account "items in process of collection," and the liability account "deferred credit items." Statement float is usually positive since it is more often the case that reserve credit is given before the checks are actually collected than the other way around.

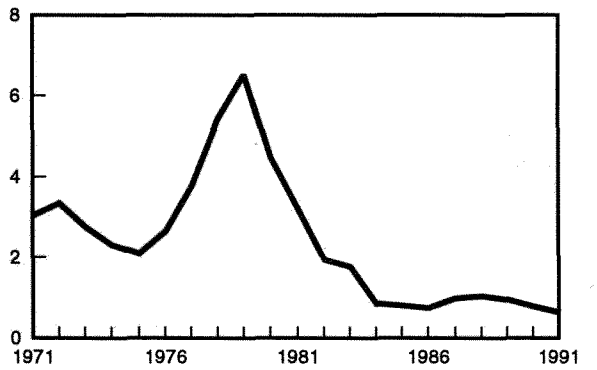
Published data on Federal Reserve float are based on a "reserves-factor" framework rather than a balance sheet accounting framework. As published, Federal Reserve float includes statement float, as defined above, as well as float-related "as-of" adjustments.[11] These adjustments represent corrections for errors that arise in processing transactions related to Federal Reserve priced services. As-of adjustments do not change the balance sheets of either the Federal Reserve Banks or an individual bank. Rather they are corrections to the bank's reserve position, thereby affecting the calculation of whether or not the bank meets its reserve requirements.

An Increase in Federal Reserve Float Increases Bank Reserves

As float rises, total bank reserves rise by the same amount. For example, suppose Bank A receives checks totaling $100 drawn on Banks B, C, and D, all in distant cities. Bank A increases the accounts of its depositors $100, and sends the items to a Federal Reserve Bank for collection. Upon receipt of the checks, the Reserve Bank increases its own asset account "items in process of collection," and increases its liability account "deferred credit items" (checks and other items not yet credited to the sending banks' reserve accounts). As long as these two accounts move together, there is no change in float or in total reserves from this source. *See illustration 21.*

On the next business day (assuming Banks B, C, and D are one-day deferred availability points), the Reserve Bank pays Bank A. The Reserve Bank's "deferred credit items" account is reduced, and Bank A's reserve account is increased $100. If these items actually take more than one business day to collect so that "items in process of collection" are not reduced that day, the credit to Bank A represents an addition to total bank reserves since the reserve accounts of Banks B, C, and D will not have been commensurately reduced.[12] *See illustration 22.*

Federal Reserve float (including as-of adjustments)
annual averages, billions of dollars



A Decline in Federal Reserve Float Reduces Bank Reserves

Only when the checks are actually collected from Banks B, C, and D does the float involved in the above example disappear — "items in process of collection" of the Reserve Bank decline as the reserve accounts of Banks B, C, and D are reduced. *See illustration 23.*

On an annual average basis, Federal Reserve float declined dramatically from 1979 through 1984, in part reflecting actions taken to implement provisions of the Monetary Control Act that directed the Federal Reserve to reduce and price float. *(See chart.)* Since 1984, Federal Reserve float has been fairly stable on an annual average basis, but often fluctuates sharply over short periods. From the standpoint of the effect on bank reserves, the significant aspect of float is not that it exists but that its volume changes in a difficult-to-predict way. Float can increase unexpectedly, for example, if weather conditions ground planes transporting checks to paying banks for collection. However, such periods typically are followed by ones where actual collections exceed new items being received for collection. Thus, reserves gained from float expansion usually are quite temporary.

[10]Federal Reserve float also arises from other funds transfer services provided by the Fed, such as wire transfers, securities transfers, and automatic clearinghouse transfers.

[11]As-of adjustments also are used as one means of pricing float, as discussed on page 22, and for nonfloat-related corrections, as discussed on page 35.

[12]If the checks received from Bank A had been erroneously assigned a two-day deferred availability, then neither statement float nor reserves would increase, although both should. Bank A's reserve position and published Federal Reserve float data are corrected for this and similar errors through as-of adjustments.

21 When a bank receives deposits in the form of checks drawn on other banks, it can send them to the Federal Reserve Bank for collection. (Required reserves are not affected immediately because requirements apply to *net* transaction accounts, i.e., total transaction accounts minus both cash items in process of collection and deposits due from domestic depository institutions.)

FEDERAL RESERVE BANK

Assets		Liabilities	
Items in process of collection	+100	Deferred credit items	+100

BANK A

Assets		Liabilities	
Cash items in process of collection	+100	Deposits	+100

22 If the reserve account of the payee bank is credited before the reserve accounts of the paying banks are debited, total reserves increase.

FEDERAL RESERVE BANK

Assets		Liabilities	
		Deferred credit items	-100
		Reserve accounts: Bank A	+100

BANK A

Assets		Liabilities	
Cash items in process of collection	-100		
Reserves with F.R. Banks	+100		
Required	*+10*		
Excess	*+90*		

23 But upon actual collection of the items, accounts of the paying banks are charged, and total reserves decline.

FEDERAL RESERVE BANK

Assets		Liabilities	
Items in process of collection	-100	Reserve accounts: Bank B, Bank C, Bank D	-100

BANKS B, C, AND D

Assets		Liabilities	
Reserves with F.R. Banks	-100	Deposits	-100
Required	*-10*		
Deficit	*90*		

Changes in Service-Related Balances and Adjustments

In order to foster a safe and efficient payments system, the Federal Reserve offers banks a variety of payments services. Prior to passage of the Monetary Control Act in 1980, the Federal Reserve offered its services free, but only to banks that were members of the Federal Reserve System. The Monetary Control Act directed the Federal Reserve to offer its services to all depository institutions, to charge for these services, and to reduce and price Federal Reserve float.[13] Except for float, all services covered by the Act were priced by the end of 1982. Implementation of float pricing essentially was completed in 1983.

The advent of Federal Reserve priced services led to several changes that affect the use of funds in banks' reserve accounts. As a result, only part of the total balances in bank reserve accounts is identified as "reserve balances" available to meet reserve requirements. Other balances held in reserve accounts represent "service-related balances and adjustments (to compensate for float)." Service-related balances are "required clearing balances" held by banks that use Federal Reserve services while "adjustments" represent balances held by banks that pay for float with as-of adjustments.

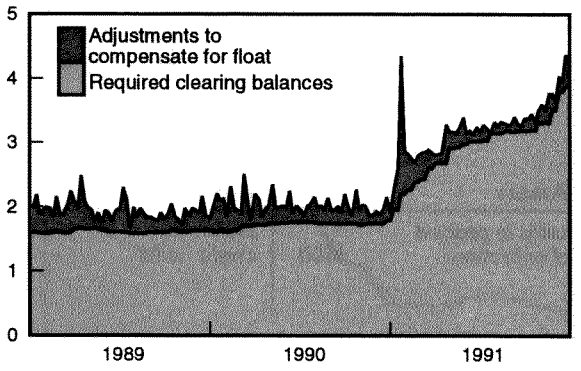
An Increase in Required Clearing Balances Reduces Reserve Balances

Procedures for establishing and maintaining clearing balances were approved by the Board of Governors of the Federal Reserve System in February 1981. A bank may be required to hold a clearing balance if it has no required reserve balance or if its required reserve balance (held to satisfy reserve requirements) is not large enough to handle its volume of clearings. Typically a bank holds both reserve balances and required clearing balances in the same reserve account. Thus, as required clearing balances are established or increased, the amount of funds in reserve accounts identified as reserve balances declines.

Suppose Bank A wants to use Federal Reserve services but has a reserve balance requirement that is less than its expected operating needs. With its Reserve Bank, it is determined that Bank A must maintain a required clearing balance of $1,000. If Bank A has no excess reserve balance, it will have to obtain funds from some other source. Bank A could sell $1,000 of securities, but this will reduce the amount of total bank reserve balances and deposits. *See illustration 24.*

Banks are billed each month for the Federal Reserve services they have used with payment collected on a specified day the following month. All required clearing balances held generate "earnings credits" which can be used only to offset charges for Federal Reserve services.[14] Alternatively, banks can pay for services through a direct charge to their reserve accounts. If accrued earnings credits are used to pay for services, then reserve balances are unaffected. On the other hand, if payment for services takes the form of a direct charge to the bank's reserve account, then reserve balances decline. *See illustration 25.*

Service-related balances and adjustments
weekly averages, billions of dollars, not seasonally adjusted



Float Pricing As-Of Adjustments Reduce Reserve Balances

In 1983, the Federal Reserve began pricing explicitly for float,[15] specifically "interterritory" check float, i.e., float generated by checks deposited by a bank served by one Reserve Bank but drawn on a bank served by another Reserve Bank. The depositing bank has three options in paying for interterritory check float it generates. It can use its earnings credits, authorize a direct charge to its reserve account, or pay for the float with an as-of adjustment. If either of the first two options is chosen, the accounting entries are the same as paying for other priced services. If the as-of adjustment option is chosen, however, the balance sheets of the Reserve Banks and the bank are not directly affected. In effect what happens is that part of the total balances held in the bank's reserve account is identified as being held to compensate the Federal Reserve for float. This part, then, cannot be used to satisfy either reserve requirements or clearing balance requirements. Float pricing as-of adjustments are applied two weeks after the related float is generated. Thus, an individual bank has sufficient time to obtain funds from other sources in order to avoid any reserve deficiencies that might result from float pricing as-of adjustments. If all banks together have no excess reserves, however, the float pricing as-of adjustments lead to a decline in total bank reserve balances.

Week-to-week changes in service-related balances and adjustments can be volatile, primarily reflecting adjustments to compensate for float. *(See chart.)* Since these changes are known in advance, any undesired impact on reserve balances can be offset easily through open market operations.

[13]The Act specified that fee schedules cover services such as check clearing and collection, wire transfer, automated clearinghouse, settlement, securities safekeeping, noncash collection, Federal Reserve float, and any new services offered.

[14]"Earnings credits" are calculated by multiplying the actual average clearing balance held over a maintenance period, up to that required plus the clearing balance band, times a rate based on the average federal funds rate. The clearing balance band is 2 percent of the required clearing balance or $25,000, whichever amount is larger.

[15]While some types of float are priced directly, the Federal Reserve prices other types of float indirectly, for example, by including the cost of float in the per-item fees for the priced service.

24 When Bank A establishes a required clearing balance at a Federal Reserve Bank by selling securities, the reserve balances and deposits of other banks decline.

BANK A

Assets		Liabilities	
U.S. government securities	- 1,000		
Reserve account with F.R. Banks:			
Required clearing balance	+ 1,000		

FEDERAL RESERVE BANK

Assets		Liabilities	
		Reserve accounts:	
		Required clearing balances:	
		Bank A	+ 1,000
		Reserve balances:	
		Other banks	- 1,000

OTHER BANKS

Assets		Liabilities	
Reserve accounts with F.R. Banks:		Deposits	- 1,000
Reserve balances	- 1,000		
Required	*-100*		
Deficit	*900*		

25 When Bank A is billed monthly for Federal Reserve services used, it can pay for these services by having earnings credits applied and/or by authorizing a direct charge to its reserve account. Suppose Bank A has accrued earnings credits of $100 but incurs fees of $125. Then both methods would be used. On the Federal Reserve Bank's books, the liability account "earnings credits due to depository institutions" declines by $100 and Bank A's reserve account is reduced by $25. Offsetting these entries is a reduction in the Fed's (other) asset account "accrued service income." On Bank A's books, the accounting entries might be a $100 reduction to its asset account "earnings credit due from Federal Reserve Banks" and a $25 reduction in its reserve account, which are offset by a $125 decline in its liability "accounts payable." While an individual bank may use different accounting entries, the net effect on reserves is a reduction of $25, the amount of billed fees that were paid through a direct charge to Bank A's reserve account.

FEDERAL RESERVE BANK

Assets		Liabilities	
Accrued service income	- 125	Earnings credits due to depository institutions	- 100
		Reserve accounts:	
		Bank A	- 25

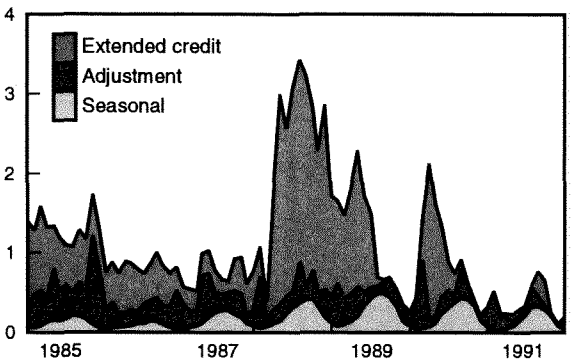
BANK A

Assets		Liabilities	
Earnings credits due from F.R. Banks	- 100	Accounts payable	- 125
Reserves with F.R. Banks	- 25		

Changes in Loans to Depository Institutions

Prior to passage of the Monetary Control Act of 1980, only banks that were members of the Federal Reserve System had regular access to the Fed's "discount window." Since then, all institutions having deposits reservable under the Act also have been able to borrow from the Fed. Under conditions set by the Federal Reserve, loans are available under three credit programs: adjustment, seasonal, and extended credit.[16] The average amount of each type of discount window credit provided varies over time. *(See chart.)*

Loans to depository institutions
monthly averages, billions of dollars, not seasonally adjusted



When a bank borrows from a Federal Reserve Bank, it borrows reserves. The acquisition of reserves in this manner differs in an important way from the cases already illustrated. Banks normally borrow adjustment credit only to avoid reserve deficiencies or overdrafts, not to obtain excess reserves. Adjustment credit borrowings, therefore, are reserves on which expansion has already taken place. How can this happen?

In their efforts to accommodate customers as well as to keep fully invested, banks frequently make loans in anticipation of inflows of loanable funds from deposits or money market sources. Loans add to bank deposits but not to bank reserves. Unless excess reserves can be tapped, banks will not have enough reserves to meet the reserve requirements against the new deposits. Likewise, individual banks may incur deficiencies through unexpected deposit outflows and corresponding losses of reserves through clearings. Other banks receive these deposits and can increase their loans accordingly, but the banks that lost them may not be able to reduce outstanding loans or investments in order to restore their reserves to required levels within the required time period. In either case, a bank may borrow reserves temporarily from its Reserve Bank.

Suppose a customer of Bank A wants to borrow $100. On the basis of the management's judgment that the bank's reserves will be sufficient to provide the necessary funds, the customer is accommodated. The loan is made by increasing "loans" and crediting the customer's deposit account. Now Bank A's deposits have increased by $100. However, if reserves are insufficient to support the higher deposits, Bank A will have a $10 reserve deficiency, assuming requirements of 10 percent. *See illustration 26.* Bank A may temporarily borrow the $10 from its Federal Reserve Bank, which makes a loan by increasing its asset item "loans to depository institutions" and crediting Bank A's reserve account. Bank A gains reserves and a corresponding liability "borrowings from Federal Reserve Banks." *See illustration 27.*

To repay borrowing, a bank must gain reserves through either deposit growth or asset liquidation. *See illustration 28.* A bank makes payment by authorizing a debit to its reserve account at the Federal Reserve Bank. Repayment of borrowing, therefore, reduces both reserves and "borrowings from Federal Reserve Banks." *See illustration 29.*

Unlike loans made under the seasonal and extended credit programs, adjustment credit loans to banks generally must be repaid within a short time since such loans are made primarily to cover needs created by temporary fluctuations in deposits and loans relative to usual patterns. Adjustments, such as sales of securities, made by some banks to "get out of the window" tend to transfer reserve shortages to other banks and may force these other banks to borrow, especially in periods of heavy credit demands. Even at times when the total volume of adjustment credit borrowing is rising, some individual banks are repaying loans while others are borrowing. In the aggregate, adjustment credit borrowing usually increases in periods of rising business activity when the public's demands for credit are rising more rapidly than nonborrowed reserves are being provided by System open market operations.

Discount Window as a Tool of Monetary Policy

Although reserve expansion through borrowing is initiated by banks, the amount of reserves that banks can acquire in this way ordinarily is limited by the Federal Reserve's administration of the discount window and by its control of the rate charged banks for adjustment credit loans — the discount rate.[17] Loans are made only for approved purposes, and other reasonably available sources of funds must have been fully used. Moreover, banks are discouraged from borrowing adjustment credit too frequently or for extended time periods. Raising the discount rate tends to restrain borrowing by increasing its cost relative to the cost of alternative sources of reserves.

Discount window administration is an important adjunct to the other Federal Reserve tools of monetary policy. While the privilege of borrowing offers a "safety valve" to temporarily relieve severe strains on the reserve positions of individual banks, there is generally a strong incentive for a bank to repay borrowing before adding further to its loans and investments.

[16]Adjustment credit is short-term credit available to meet temporary needs for funds. Seasonal credit is available for longer periods to smaller institutions having regular seasonal needs for funds. Extended credit may be made available to an institution or group of institutions experiencing sustained liquidity pressures. The reserves provided through extended credit borrowing typically are offset by open market operations.

[17]Flexible discount rates related to rates on money market sources of funds currently are charged for seasonal credit and for extended credit outstanding more than 30 days.

26 A bank may incur a reserve deficiency if it makes loans when it has no excess reserves.

BANK A

Assets		Liabilities	
Loans	+100	Deposits	+100
Reserves with F.R. Banks	no change		
Required	*+10*		
Deficit	*10*		

27 Borrowing from a Federal Reserve Bank to cover such a deficit is accompanied by a direct credit to the bank's reserve account.

FEDERAL RESERVE BANK

Assets		Liabilities	
Loans to depository institutions: Bank A	+ 10	Reserve accounts: Bank A	+ 10

BANK A

Assets		Liabilities	
Reserves with F.R. Banks	+ 10	Borrowings from F.R. Banks	+ 10

No further expansion can take place on the new reserves because they are all needed against the deposits created in (26).

28 Before a bank can repay borrowings, it must gain reserves from some other source.

BANK A

Assets		Liabilities	
Securities	- 10		
Reserves with F.R. Banks	+ 10		

29 Repayment of borrowings from the Federal Reserve Bank reduces reserves.

FEDERAL RESERVE BANK

Assets		Liabilities	
Loans to depository institutions: Bank A	- 10	Reserve accounts: Bank A	- 10

BANK A

Assets		Liabilities	
Reserves with F.R. Banks	- 10	Borrowings from F.R. Banks	- 10

Changes in Reserve Requirements

Thus far we have described transactions that affect the volume of bank reserves and the impact these transactions have upon the capacity of the banks to expand their assets and deposits. It is also possible to influence deposit expansion or contraction by changing the required minimum ratio of reserves to deposits.

The authority to vary required reserve percentages for banks that were members of the Federal Reserve System (member banks) was first granted by Congress to the Federal Reserve Board of Governors in 1933. The ranges within which this authority can be exercised have been changed several times, most recently in the Monetary Control Act of 1980, which provided for the establishment of reserve requirements that apply uniformly to all depository institutions. The 1980 statute established the following limits:

On transaction accounts	
first $25 million	*3%*
above $25 million	*8% to 14%*
On nonpersonal time deposits	*0% to 9%*

The 1980 law initially set the requirement against transaction accounts over $25 million at 12 percent and that against nonpersonal time deposits at 3 percent. The initial $25 million "low reserve tranche" was indexed to change each year in line with 80 percent of the growth in transaction accounts at all depository institutions. (For example, the low reserve tranche was increased from $41.1 million for 1991 to $42.2 million for 1992.) In addition, reserve requirements can be imposed on certain nondeposit sources of funds, such as Eurocurrency liabilities.[18] (Initially the Board set a 3 percent requirement on Eurocurrency liabilities.)

The Garn-St Germain Act of 1982 modified these provisions somewhat by exempting from reserve requirements the first $2 million of total reservable liabilities at each depository institution. Similar to the low reserve tranche adjustment for transaction accounts, the $2 million "reservable liabilities exemption amount" was indexed to 80 percent of annual increases in total reservable liabilities. (For example, the exemption amount was increased from $3.4 million for 1991 to $3.6 million for 1992.)

The Federal Reserve Board is authorized to change, at its discretion, the percentage requirements on transaction accounts above the low reserve tranche and on nonpersonal time deposits within the ranges indicated above. In addition, the Board may impose differing reserve requirements on nonpersonal time deposits based on the maturity of the deposit. (The Board initially imposed the 3 percent nonpersonal time deposit requirement only on such deposits with original maturities of under four years.)

During the phase-in period, which ended in 1984 for most member banks and in 1987 for most nonmember institutions, requirements changed according to a predetermined schedule, without any action by the Federal Reserve Board. Apart from these legally prescribed changes, once the Monetary Control Act provisions were implemented in late 1980, the Board did not change any reserve requirement ratios until late 1990. (The original maturity break for requirements on nonpersonal time deposits was shortened several times, once in 1982 and twice in 1983, in connection with actions taken to deregulate rates paid on deposits.) In December 1990, the Board reduced reserve requirements against nonpersonal time deposits and Eurocurrency liabilities from 3 percent to zero. Effective in April 1992, the reserve requirement on transaction accounts above the low reserve tranche was lowered from 12 percent to 10 percent.

When reserve requirements are lowered, a portion of banks' existing holdings of required reserves becomes excess reserves and may be loaned or invested. For example, with a requirement of 10 percent, $10 of reserves would be required to support $100 of deposits. *See illustration 30.* But a reduction in the legal requirement to 8 percent would tie up only $8, freeing $2 out of each $10 of reserves for use in creating additional bank credit and deposits. *See illustration 31.*

An increase in reserve requirements, on the other hand, absorbs additional reserve funds, and banks which have no excess reserves must acquire reserves or reduce loans or investments to avoid a reserve deficiency. Thus an increase in the requirement from 10 percent to 12 percent would boost required reserves to $12 for each $100 of deposits. Assuming banks have no excess reserves, this would force them to liquidate assets until the reserve deficiency was eliminated, at which point deposits would be one-sixth less than before. *See illustration 32.*

Reserve Requirements and Monetary Policy

The power to change reserve requirements, like purchases and sales of securities by the Federal Reserve, is an instrument of monetary policy. Even a small change in requirements — say, one-half of one percentage point — can have a large and widespread impact. Other instruments of monetary policy have sometimes been used to cushion the initial impact of a reserve requirement change. Thus, the System may sell securities (or purchase less than otherwise would be appropriate) to absorb part of the reserves released by a cut in requirements.

It should be noted that in addition to their initial impact on excess reserves, changes in requirements alter the expansion power of every reserve dollar. Thus, such changes affect the leverage of all subsequent increases or decreases in reserves from any source. For this reason, changes in the total volume of bank reserves actually held between points in time when requirements differ do not provide an accurate indication of the Federal Reserve's policy actions.

Both reserve balances and vault cash are eligible to satisfy reserve requirements. To the extent some institutions normally hold vault cash to meet operating needs in amounts exceeding their required reserves, they are unlikely to be affected by any change in requirements.

[18]The 1980 statute also provides that "under extraordinary circumstances" reserve requirements can be imposed at any level on any liability of depository institutions for as long as six months; and, if essential for the conduct of monetary policy, supplemental requirements up to 4 percent of transaction accounts can be imposed.

30 Under a 10 percent reserve requirement, $10 of reserves are needed to support each $100 of deposits.

BANK A

Assets		Liabilities	
Loans and investments	90	Deposits	100
Reserves	10		
Required	*10*		
Excess	*0*		

31 With a reduction in requirements from 10 percent to 8 percent, fewer reserves are required against the same volume of deposits so that excess reserves are created. These can be loaned or invested.

BANK A

Assets		Liabilities	
Loans and investments	90	Deposits	100
Reserves	10		
Required	*8*		
Excess	*2*		

FEDERAL RESERVE BANK

Assets	Liabilities
NO CHANGE	

There is no change in the total amount of bank reserves.

32 With an increase in requirements from 10 percent to 12 percent, more reserves are required against the same volume of deposits. The resulting deficiencies must be covered by liquidation of loans or investments . . .

BANK A

Assets		Liabilities	
Loans and investments	90	Deposits	100
Reserves	10		
Required	*12*		
Deficit	*2*		

FEDERAL RESERVE BANK

Assets	Liabilities
NO CHANGE	

. . .because the total amount of bank reserves remains unchanged.

Changes in Foreign-Related Factors

The Federal Reserve has engaged in foreign currency operations for its own account since 1962. In addition, it acts as the agent for foreign currency transactions of the U.S. Treasury, and since the 1950s has executed transactions for customers such as foreign central banks. Perhaps the most publicized type of foreign currency transaction undertaken by the Federal Reserve is intervention in the foreign exchange markets. Intervention, however, is only one of several foreign-related transactions that have the potential for increasing or decreasing reserves of banks, thereby affecting money and credit growth.

Several foreign-related transactions and their effects on U.S. bank reserves are described in the next few pages. Included are some but not all of the types of transactions used. The key point to remember, however, is that the Federal Reserve routinely offsets any undesired change in U.S bank reserves resulting from foreign-related transactions. As a result, such transactions do not affect money and credit growth in the United States.

Foreign Exchange Intervention for the Federal Reserve's Own Account

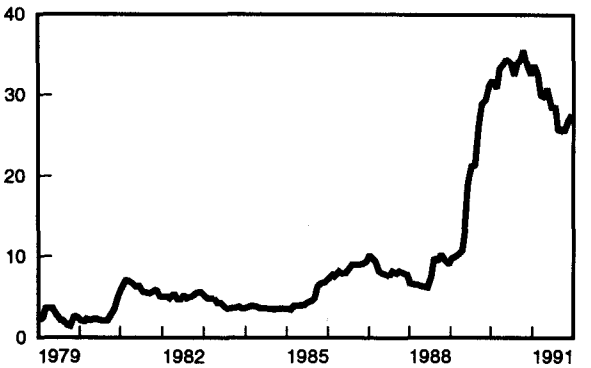
When the Federal Reserve intervenes in foreign exchange markets to sell dollars for its own account,[19] it acquires foreign currency assets and reserves of U.S. banks initially rise. In contrast, when the Fed intervenes to buy dollars for its own account, it uses foreign currency assets to pay for the dollars purchased and reserves of U.S. banks initially fall.

Consider the example where the Federal Reserve intervenes in the foreign exchange markets to sell $100 of U.S. dollars for its own account. In this transaction, the Federal Reserve buys a foreign-currency-denominated deposit of a U.S. bank held at a foreign commercial bank,[20] and pays for this foreign currency deposit by crediting $100 to the U.S. bank's reserve account at the Fed. The Federal Reserve deposits the foreign currency proceeds in its account at a Foreign Central Bank, and as this transaction clears, the foreign bank's reserves at the Foreign Central Bank decline. *See illustration 33 on pages 30-31.* Initially, then, the Fed's intervention sale of dollars in this example leads to an increase in Federal Reserve Bank assets denominated in foreign currencies and an increase in reserves of U.S. banks.

Suppose instead that the Federal Reserve intervenes in the foreign exchange markets to buy $100 of U.S. dollars, again for its own account. The Federal Reserve purchases a dollar-denominated deposit of a foreign bank held at a U.S. bank, and pays for this dollar deposit by drawing on its foreign currency deposit at a Foreign Central Bank. (The Federal Reserve might have to sell some of its foreign currency investments to build up its deposits at the Foreign Central Bank, but this would not affect U.S. bank reserves.) As the Federal Reserve's account at the Foreign Central Bank is charged, the foreign bank's reserves at the Foreign Central Bank increase. In turn, the dollar deposit of the foreign bank at the U.S. bank declines as the U.S. bank transfers ownership of those dollars to the Federal Reserve via a $100 charge to its reserve account at the Federal Reserve. *See illustration 34 on pages 30-31.* Initially, then, the Fed's intervention purchase of dollars in this example leads to a decrease in Federal Reserve Bank assets denominated in foreign currencies and a decrease in reserves of U.S. banks.

Federal Reserve Bank assets denominated in foreign currencies

end of month, billions of dollars, not seasonally adjusted



As noted earlier, the Federal Reserve offsets or "sterilizes" any undesired change in U.S. bank reserves stemming from foreign exchange intervention sales or purchases of dollars. For example, Federal Reserve Bank assets denominated in foreign currencies rose dramatically in 1989, in part due to significant U.S. intervention sales of dollars. *(See chart on this page.)* Total reserves of U.S. banks, however, declined slightly in 1989 as open market operations were used to "sterilize" the initial intervention-induced increase in reserves.

Monthly Revaluation of Foreign Currency Assets

Another set of accounting transactions that affects Federal Reserve Bank assets denominated in foreign currencies is the monthly revaluation of such assets. Two business days prior to the end of the month, the Fed's foreign currency assets are increased if their market value has appreciated or decreased if their value has depreciated. The offsetting accounting entry on the Fed's balance sheet is to the "exchange-translation account" included in "other F.R. liabilities." These changes in the Fed's balance sheet do not alter bank reserves directly. However, since the Federal Reserve turns over its net earnings to the Treasury each week, the revaluation affects the amount of the Fed's payment to the Treasury, which in turn influences the size of TT&L calls and bank reserves. (See explanation on pages 18 and 19.)

[19]Overall responsibility for U.S. intervention in foreign exchange markets rests with the U.S. Treasury. Foreign exchange transactions for the Federal Reserve's account are carried out under directives issued by the Federal Reserve's Open Market Committee within the general framework of exchange rate policy established by the U.S. Treasury in consultation with the Fed. They are implemented at the Federal Reserve Bank of New York, typically at the same time that similar transactions are executed for the Treasury's Exchange Stabilization Fund.

[20]Americans traveling to foreign countries engage in "foreign exchange" transactions whenever they obtain foreign coins and paper currency in exchange for U.S. coins and currency. However, most foreign exchange transactions do not involve the physical exchange of coins and currency. Rather, most of these transactions represent the buying and selling of foreign currencies by exchanging one bank deposit denominated in one currency for another bank deposit denominated in another currency. For ease of exposition, the examples assume that U.S. banks and foreign banks are the market participants in the intervention transactions, but the impact on reserves would be the same if the U.S. or foreign public were involved.

Foreign-Related Transactions for the Treasury

U.S. intervention in foreign exchange markets by the Federal Reserve usually is divided between its own account and the Treasury's Exchange Stabilization Fund (ESF) account. The impact on U.S. bank reserves from the intervention transaction is the same for both — sales of dollars add to reserves while purchases of dollars drain reserves. *See illustration 35 on pages 30-31.* Depending upon how the Treasury pays for, or finances, its part of the intervention, however, the Federal Reserve may not need to conduct offsetting open market operations.

The Treasury typically keeps only minimal balances in the ESF's account at the Federal Reserve. Therefore, the Treasury generally has to convert some ESF assets into dollar or foreign currency deposits in order to pay for its part of an intervention transaction. Likewise, the dollar or foreign currency deposits acquired by the ESF in the intervention typically are drawn down when the ESF invests the proceeds in earning assets.

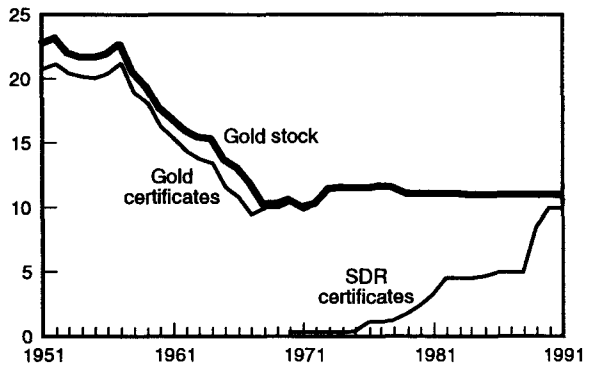
For example, to finance an intervention sale of dollars (such as that shown in illustration 35), the Treasury might redeem some of the U.S. government securities issued to the ESF, resulting in a transfer of funds from the Treasury's (general account) balances at the Federal Reserve to the ESF's account at the Fed. (On the Federal Reserve's balance sheet, the ESF's account is included in the liability category "other deposits.") The Treasury, however, would need to replenish its Fed balances to desired levels, perhaps by increasing the size of TT&L calls — a transaction that drains U.S. bank reserves. The intervention and financing transactions essentially occur simultaneously. As a result, U.S. bank reserves added in the intervention sale of dollars are offset by the drain in U.S. bank reserves from the TT&L call. *See illustrations 35 and 36 on pages 30-31.* Thus, no Federal Reserve offsetting actions would be needed if the Treasury financed the intervention sale of dollars through a TT&L call on banks.

Offsetting actions by the Federal Reserve would be needed, however, if the Treasury restored deposits affected by foreign-related transactions through a number of transactions involving the Federal Reserve. These include the Treasury's issuance of SDR or gold certificates to the Federal Reserve and the "warehousing" of foreign currencies by the Federal Reserve.

SDR certificates. Occasionally the Treasury acquires dollar deposits for the ESF's account by issuing certificates to the Federal Reserve against allocations of Special Drawing Rights (SDRs) received from the International Monetary Fund.[21] For example, $3.5 billion of SDR certificates were issued in 1989, and another $1.5 billion in 1990. This "monetization" of SDRs is reflected on the Federal Reserve's balance sheet as an increase in its asset "SDR certificate account" and an increase in its liability "other deposits (ESF account)."

If the ESF uses these dollar deposits directly in an intervention sale of dollars, then the intervention-induced increase in U.S. bank reserves is not altered. *See illustrations 35 and 37 on pages 30-31.* If not needed immediately for an intervention transaction, the ESF might use the dollar deposits from issuance of SDR certificates to buy securities

U.S gold stock, gold certificates and SDR certificates
end of year, billions of dollars



from the Treasury, resulting in a transfer of funds from the ESF's account at the Federal Reserve to the Treasury's account at the Fed. U.S. bank reserves would then increase as the Treasury spent the funds or transferred them to banks through a direct investment to TT&L note accounts.

Gold stock and gold certificates. Changes in the U.S. monetary gold stock used to be an important factor affecting bank reserves. However, the gold stock and gold certificates issued to the Federal Reserve in "monetizing" gold, have not changed significantly since the early 1970s. *(See chart on this page.)*

Prior to August 1971, the Treasury bought and sold gold for a fixed price in terms of U.S. dollars, mainly at the initiative of foreign central banks and governments. Gold purchases by the Treasury were added to the U.S. monetary gold stock, and paid for from its account at the Federal Reserve. As the sellers deposited the Treasury's checks in banks, reserves increased. To replenish its balance at the Fed, the Treasury issued gold certificates to the Federal Reserve and received a credit to its deposit balance.

Treasury sales of gold have the opposite effect. Buyers' checks are credited to the Treasury's account and reserves decline. Because the official U.S. gold stock is now fully "monetized," the Treasury currently has to use its deposits to retire gold certificates issued to the Federal Reserve whenever gold is sold. However, the value of gold certificates retired, as well as the net contraction in bank reserves, is based on the official gold price. Proceeds from a gold sale at the market price to meet demands of domestic buyers likely would be greater. The difference represents the Treasury's profit, which, when spent, restores deposits and bank reserves by a like amount.

While the Treasury no longer purchases gold and sales of gold have been limited, increases in the official price of gold have added to the value of the gold stock. (The official gold price was last raised, from $38.00 to $42.22 per troy ounce, in 1973.)

Warehousing. The Treasury sometimes acquires dollar deposits at the Federal Reserve by "warehousing" foreign currencies with the Fed. (For example, $7 billion of foreign

[21]SDRs were created in 1970 for use by governments in official balance of payments transactions.

33 When the Federal Reserve intervenes to sell dollars for its own account, it pays for a foreign-currency-denominated deposit of a U.S. bank at a foreign commercial bank by crediting the reserve account of the U.S. bank, and acquires a foreign currency asset in the form of a deposit at a Foreign Central Bank. The Federal Reserve, however, will offset the increase in U.S. bank reserves if it is inconsistent with domestic policy objectives.

FEDERAL RESERVE BANK

Assets		Liabilities	
Deposits at Foreign Central Bank	+ 100	Reserves: U.S. bank	+ 100 ←

34 When the Federal Reserve intervenes to buy dollars for its own account, it draws down its foreign currency deposits at a Foreign Central Bank to pay for a dollar-denominated deposit of a foreign bank at a U.S. bank, which leads to a contraction in reserves of the U.S. bank. This reduction in reserves will be offset by the Federal Reserve if it is inconsistent with domestic policy objectives.

FEDERAL RESERVE BANK

Assets		Liabilities	
Deposits at Foreign Central Bank	- 100	Reserves: U.S. bank	- 100 ←

35 In an intervention sale of dollars for the U.S. Treasury, deposits of the ESF at the Federal Reserve are used to pay for a foreign currency deposit of a U.S. bank at a foreign bank, and the foreign currency proceeds are deposited in an account at a Foreign Central Bank. U.S. bank reserves increase as a result of this intervention transaction.

ESF

Assets		Liabilities	
Deposits at F.R. Banks	- 100		
Deposits at Foreign Central Bank	+ 100		

U.S. TREASURY

Assets		Liabilities	

FEDERAL RESERVE BANK

Assets		Liabilities	
		Reserves: U.S. bank	+ 100 ←
		Other deposits: ESF	- 100

36 Concurrently, the Treasury must finance the intervention transaction in (35). The Treasury might build up deposits in the ESF's account at the Federal Reserve by redeeming securities issued to the ESF, and replenish its own (general account) deposits at the Federal Reserve to desired levels by issuing a call on TT&L note accounts. This set of transactions drains reserves of U.S. banks by the same amount as the intervention in (35) added to U.S. bank reserves.

ESF

Assets		Liabilities	
U.S. govt. securities	- 100		
Deposits at F.R. Banks	+ 100		

U.S. TREASURY

Assets		Liabilities	
TT&L accts.	- 100	Securities issued ESF	- 100
Deposits at F.R. Banks	net 0		
[from U.S. bank	*+100]*		
[to ESF	*-100]*		

FEDERAL RESERVE BANK

Assets		Liabilities	
		Reserves: U.S. banks	- 100 ←
		Treas. deps.:	net 0
		[from U.S. bank	*+100]*
		[to ESF	*-100]*
		Other deposits: ESF	+ 100

37 Alternatively, the Treasury might finance the intervention in (35) by issuing SDR certificates to the Federal Reserve, a transaction that would not disturb the addition of U.S. bank reserves in intervention (35). The Federal Reserve, however, would offset any undesired change in U.S. bank reserves.

ESF

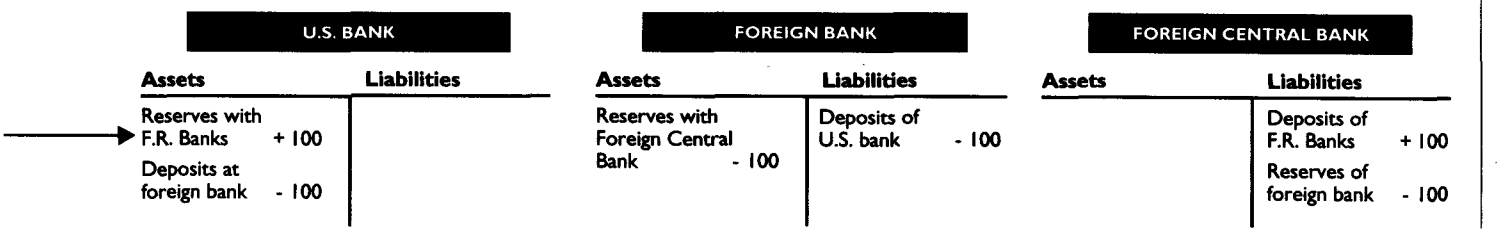
Assets		Liabilities	
Deposits at F.R. Banks	+ 100	SDR certificates issued to F.R. Banks	+ 100

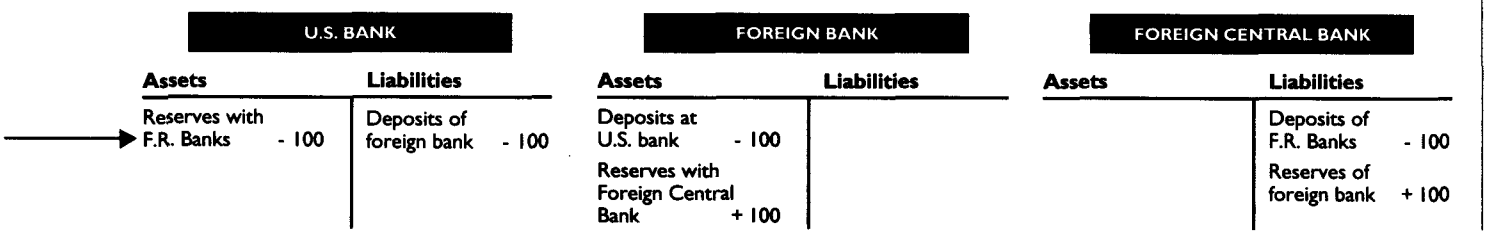
U.S. TREASURY

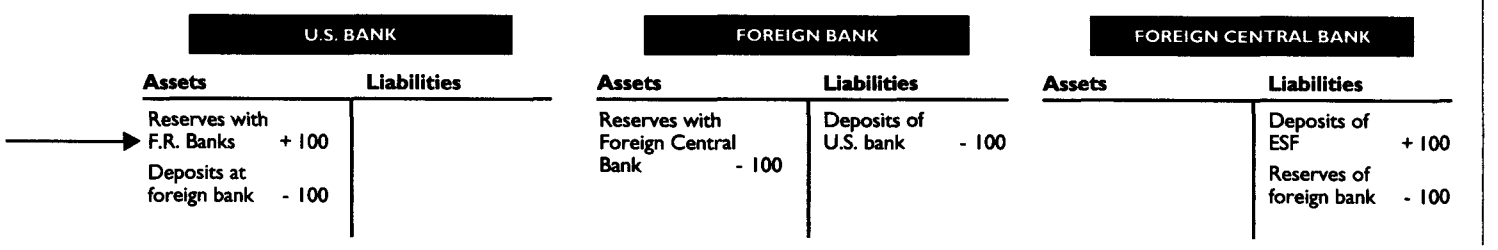
Assets		Liabilities	

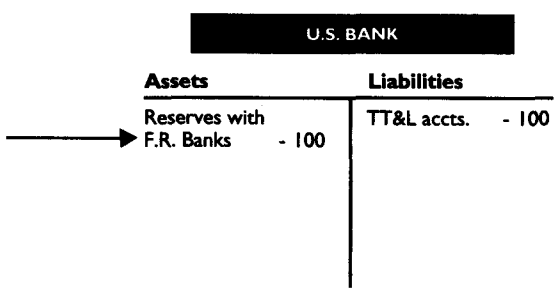
FEDERAL RESERVE BANK

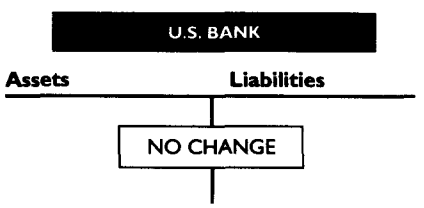
Assets		Liabilities	
SDR certificate account	+ 100	Other deposits: ESF	+ 100


U.S. BANK
Assets
Liabilities
Reserves with F.R. Banks + 100
Deposits at foreign bank - 100
FOREIGN BANK
Assets
Liabilities
Reserves with Foreign Central Bank - 100
Deposits of U.S. bank - 100
FOREIGN CENTRAL BANK
Assets
Liabilities
Deposits of F.R. Banks + 100
Reserves of foreign bank - 100


U.S. BANK
Assets
Liabilities
Reserves with F.R. Banks - 100
Deposits of foreign bank - 100
FOREIGN BANK
Assets
Liabilities
Deposits at U.S. bank - 100
Reserves with Foreign Central Bank + 100
FOREIGN CENTRAL BANK
Assets
Liabilities
Deposits of F.R. Banks - 100
Reserves of foreign bank + 100


U.S. BANK
Assets
Liabilities
Reserves with F.R. Banks + 100
Deposits at foreign bank - 100
FOREIGN BANK
Assets
Liabilities
Reserves with Foreign Central Bank - 100
Deposits of U.S. bank - 100
FOREIGN CENTRAL BANK
Assets
Liabilities
Deposits of ESF + 100
Reserves of foreign bank - 100


U.S. BANK
Assets
Liabilities
Reserves with F.R. Banks - 100
TT&L accts. - 100


U.S. BANK
Assets
Liabilities
NO CHANGE

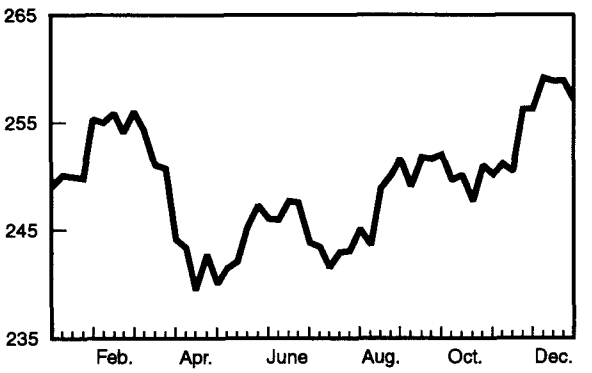
currencies were warehoused in 1989.) The Treasury or ESF acquires foreign currency assets as a result of transactions such as intervention sales of dollars or sales of U.S. government securities denominated in foreign currencies. When the Federal Reserve warehouses foreign currencies for the Treasury,[22] "Federal Reserve Bank assets denominated in foreign currencies" increase as do Treasury deposits at the Fed. As these deposits are spent, reserves of U.S. banks rise. In contrast, the Treasury likely will have to increase the size of TT&L calls — a transaction that drains reserves — when it repurchases warehoused foreign currencies from the Federal Reserve. (In 1991, $2.5 billion of warehoused foreign currencies were repurchased.) The repurchase transaction is reflected on the Fed's balance sheet as declines in both Treasury deposits at the Federal Reserve and Federal Reserve Bank assets denominated in foreign currencies.

Transactions for Foreign Customers

Many foreign central banks and governments maintain deposits at the Federal Reserve to facilitate dollar-denominated transactions. These "foreign deposits" on the liability side of the Fed's balance sheet typically are held at minimal levels that vary little from week to week. For example, foreign deposits at the Federal Reserve averaged only $237 million in 1991, ranging from $178 million to $319 million on a weekly average basis. Changes in foreign deposits are small because foreign customers "manage" their Federal Reserve balances to desired levels daily by buying and selling U.S. government securities. The extent of these foreign customer "cash management" transactions is reflected, in part, by large and frequent changes in marketable U.S. government securities held in custody by the Federal Reserve for foreign customers. *(See chart.)* The net effect of foreign customers' cash management transactions usually is to leave U.S. bank reserves unchanged.

Managing foreign deposits through sales of securities. Foreign customers of the Federal Reserve make dollar-denominated payments, including those for intervention sales of dollars by foreign central banks, by drawing down their deposits at the Federal Reserve. As these funds are deposited in U.S. banks and cleared, reserves of U.S. banks rise. *See illustration 38.* However, if payments from their accounts at the Federal Reserve lower balances to below desired levels, foreign customers will replenish their Federal Reserve deposits by selling U.S. government securities. Acting as their agent, the Federal Reserve usually executes foreign customers' sell orders in the market. As buyers pay for the securities by drawing down deposits at U.S. banks, reserves of U.S. banks fall and offset the increase in reserves from the disbursement transactions. The net effect is to leave U.S. bank reserves unchanged when U.S. government securities of foreign customers are sold in the market. *See illustrations 38 and 39.* Occasionally, however, the Federal Reserve executes foreign customers' sell orders with the System's account. When this is done, the rise in reserves from the foreign customers' disbursement of funds remains in place. *See illustrations 38 and 40.* The Federal Reserve might choose to execute sell orders with the System's account if an increase in reserves is desired for domestic policy reasons.

Marketable U.S government securities held in custody for foreign customers during 1991
Wednesday outstandings, billions of dollars



Managing foreign deposits through purchases of securities. Foreign customers of the Federal Reserve also receive a variety of dollar-denominated payments, including proceeds from intervention purchases of dollars by foreign central banks, that are drawn on U.S. banks. As these funds are credited to foreign deposits at the Federal Reserve, reserves of U.S. banks decline. But if receipts of dollar-denominated payments raise their deposits at the Federal Reserve to levels higher than desired, foreign customers will buy U.S. government securities. The net effect generally is to leave U.S. bank reserves unchanged when the U.S. government securities are purchased in the market.

Using the swap network. Occasionally, foreign central banks acquire dollar deposits by activating the "swap" network, which consists of reciprocal short-term credit arrangements between the Federal Reserve and certain foreign central banks. When a foreign central bank draws on its swap line at the Federal Reserve, it immediately obtains a dollar deposit at the Fed in exchange for foreign currencies, and agrees to reverse the exchange sometime in the future. On the Federal Reserve's balance sheet, activation of the swap network is reflected as an increase in Federal Reserve Bank assets denominated in foreign currencies and an increase in the liability category "foreign deposits." When the swap line is repaid, both of these accounts decline. Reserves of U.S. banks will rise when the foreign central bank spends its dollar proceeds from the swap drawing. *See illustration 41.* In contrast, reserves of U.S. banks will fall as the foreign central bank rebuilds its deposits at the Federal Reserve in order to repay a swap drawing.

The accounting entries and impact on U.S. bank reserves are the same if the Federal Reserve uses the swap network to borrow and repay foreign currencies. However, the Federal Reserve has not activated the swap network in recent years.

[22]Technically, warehousing consists of two parts: the Federal Reserve's agreement to purchase foreign currency assets from the Treasury or ESF for dollar deposits now, and the Treasury's agreement to repurchase the foreign currencies sometime in the future.

38 When a Foreign Central Bank makes a dollar-denominated payment from its account at the Federal Reserve, the recipient deposits the funds in a U.S. bank. As the payment order clears, U.S. bank reserves rise.

FEDERAL RESERVE BANK

Assets		Liabilities	
		Reserves: U.S. bank	+ 100
		Foreign deposits	- 100

U.S. BANK

Assets		Liabilities	
Reserves with F.R. Banks	+ 100	Deposits	+ 100

FOREIGN CENTRAL BANK

Assets		Liabilities	
Deposits at F.R. Banks	- 100	Accounts payable	- 100

39 If a decline in its deposits at the Federal Reserve lowers the balance below desired levels, the Foreign Central Bank will request that the Federal Reserve sell U.S. government securities for it. If the sell order is executed in the market, reserves of U.S. banks will fall by the same amount as reserves were increased in (38).

FEDERAL RESERVE BANK

Assets		Liabilities	
		Reserves: U.S. bank	- 100
		Foreign deposits	+ 100

U.S. BANK

Assets		Liabilities	
Reserves with F.R. Banks	- 100	Deposits of securities buyer	- 100

FOREIGN CENTRAL BANK

Assets		Liabilities
Deposits at F.R. Banks	+ 100	
U.S. govt. securities	- 100	

40 If the sell order is executed with the Federal Reserve's account, however, the increase in reserves from (38) will remain in place. The Federal Reserve might choose to execute the foreign customer's sell order with the System's account if an increase in reserves is desired for domestic policy reasons.

FEDERAL RESERVE BANK

Assets		Liabilities	
U.S. govt. securities	+ 100	Foreign deposits	+ 100

U.S. BANK

Assets	Liabilities
NO CHANGE	

FOREIGN CENTRAL BANK

Assets		Liabilities
Deposits at F.R. Banks	+ 100	
U.S. govt. securities	- 100	

41 When a Foreign Central Bank draws on a "swap" line, it receives a credit to its dollar deposits at the Federal Reserve in exchange for a foreign currency deposit credited to the Federal Reserve's account. Reserves of U.S. banks are not affected by the swap drawing transaction, but will increase as the Foreign Central Bank uses the funds as in (38).

FEDERAL RESERVE BANK

Assets		Liabilities	
Deposits at Foreign Central Bank	+ 100	Foreign deposits	+ 100

U.S. BANK

Assets	Liabilities
NO CHANGE	

FOREIGN CENTRAL BANK

Assets		Liabilities	
Deposits at F.R. Banks	+ 100	Deposits of F.R. Banks	+ 100

Federal Reserve Actions Affecting Its Holdings of U.S. Government Securities

In discussing various factors that affect reserves, it was often indicated that the Federal Reserve offsets undesired changes in reserves through open market operations, that is, by buying and selling U.S. government securities in the market. However, outright purchases and sales of securities by the Federal Reserve in the market occur infrequently, and typically are conducted when an increase or decrease in another factor is expected to persist for some time. Most market actions taken to implement changes in monetary policy or to offset changes in other factors are accomplished through the use of transactions that change reserves temporarily. In addition, there are off-market transactions the Federal Reserve sometimes uses to change its holdings of U.S. government securities and affect reserves. (Recall the example in illustrations 38 and 40.) The impact on reserves of various Federal Reserve transactions in U.S. government and federal agency securities is explained below. *(See table for a summary.)*

Outright transactions. Ownership of securities is transferred permanently to the buyer in an outright transaction, and the funds used in the transaction are transferred permanently to the seller. As a result, an outright purchase of securities by the Federal Reserve from a dealer in the market adds reserves permanently while an outright sale of securities to a dealer drains reserves permanently. The Federal Reserve can achieve the same net effect on reserves through off-market transactions where it executes outright sell and purchase orders from customers internally with the System account. In contrast, there is no impact on reserves if the Federal Reserve fills customers' outright sell and purchase orders in the market.

Temporary transactions. Repurchase agreements (RPs), and associated matched sale-purchase agreements (MSPs), transfer ownership of securities and use of funds temporarily. In an RP transaction, one party sells securities to another and agrees to buy them back on a specified future date. In an MSP transaction, one party buys securities from another and agrees to sell them back on a specified future date. In essence, then, an RP for one party in the transaction works like an MSP for the other party.

When the Federal Reserve executes what is referred to as a "System RP," it acquires securities in the market from dealers who agree to buy them back on a specified future date 1 to 15 days later. Both the System's portfolio of securities and bank reserves are increased during the term of the RP, but decline again when the dealers repurchase the securities. Thus System RPs increase reserves only temporarily. Reserves are drained temporarily when the Fed executes what is known as a "System MSP." A System MSP works like a System RP, only in the opposite direction. In a System MSP, the Fed sells securities to dealers in the market and agrees to buy them back on a specified day. The System's holdings of securities and bank reserves are reduced during the term of the MSP, but both increase when the Federal Reserve buys back the securities.

Impact on reserves of Federal Reserve transactions in U.S. government and federal agency securities

Federal Reserve Transaction	Reserve Impact
Outright Purchases of Securities	
- From dealer in market	Permanent increase
- To fill customer sell orders internally	Permanent increase
(If customer sell orders filled in market)	(No impact)
Outright Sales of Securities	
- To dealer in market	Permanent decrease
- To fill customer buy orders internally	Permanent decrease
(If customer buy orders filled in market)	(No impact)
Repurchase Agreements (RPs)	
- With dealer in market in a System RP	Temporary increase
Matched Sale-Purchase Agreements (MSPs)	
- With dealer in market in a System MSP	Temporary decrease
- To fill customer RP orders internally	No impact*
(If customer RP orders passed to market as customer-related RPs)	(Temporary increase*)
Redemption of Maturing Securities	
- Replace total amount maturing	No impact
- Redeem part of amount maturing	Permanent decrease
- Buy more than amount maturing**	Permanent increase**

* Impact based on assumption that the amount of RP orders done internally is the same as on the prior day.

**The Federal Reserve currently is prohibited by law from buying securities directly from the Treasury, except to replace maturing issues.

The Federal Reserve also uses MSPs to fill foreign customers' RP orders internally with the System account. Considered in isolation, a Federal Reserve MSP transaction with customers would drain reserves temporarily. However, these transactions occur every day, with the total amount of RP orders being fairly stable from day to day. Thus, on any given day, the Fed both buys back securities from customers to fulfill the prior day's MSP, and sells them about the same amount of securities to satisfy that day's agreement. As a result, there generally is little or no impact on reserves when the Fed uses MSPs to fill customer RP orders internally with the System account. Sometimes, however, the Federal Reserve fills some of the RP orders internally and the rest in the market. The part that is passed on to the market is known as a "customer-related RP." The Fed ends up repurchasing more securities from customers to complete the prior day's MSP than it sells to them in that day's MSP. As a result, customer-related RPs add reserves temporarily.

Maturing securities. As securities held by the Federal Reserve mature, they are exchanged for new securities. Usually the total amount maturing is replaced so that there is no impact on reserves since the Fed's total holdings remain the same. Occasionally, however, the Federal Reserve will exchange only part of the amount maturing. Treasury deposits decline as payment for the redeemed securities is made, and reserves fall as the Treasury replenishes its deposits at the Fed through TT&L calls. The reserve drain is permanent. If the Fed were to buy more than the amount of securities maturing directly from the Treasury, then reserves would increase permanently. However, the Federal Reserve currently is prohibited by law from buying securities directly from the Treasury, except to replace maturing issues.

Miscellaneous Factors Affecting Bank Reserves

The factors described below normally have negligible effects on bank reserves because changes in them either occur very slowly or tend to be balanced by concurrent changes in other factors. But at times they may require offsetting action.

Treasury Currency Outstanding

Treasury currency outstanding consists of coins, silver certificates and U.S. notes originally issued by the Treasury, and other currency originally issued by commercial banks and by Federal Reserve Banks before July 1929 but for which the Treasury has redemption responsibility. Short-run changes are small, and their effects on bank reserves are indirect.

The amount of Treasury currency outstanding currently increases only through issuance of new coin. The Treasury ships new coin to the Federal Reserve Banks for credit to Treasury deposits there. These deposits will be drawn down again, however, as the Treasury makes expenditures. Checks issued against these deposits are paid out to the public. As individuals deposit these checks in banks, reserves increase. (See explanation on pages 18 and 19.)

When any type of Treasury currency is retired, bank reserves decline. As banks turn in Treasury currency for redemption, they receive Federal Reserve notes or coin in exchange or a credit to their reserve accounts, leaving their total reserves (reserve balances and vault cash) initially unchanged. However, the Treasury's deposits in the Reserve Banks are charged when Treasury currency is retired. Transfers from TT&L balances in banks to the Reserve Banks replenish these deposits. Such transfers absorb reserves.

Treasury Cash Holdings

In addition to accounts in depository institutions and Federal Reserve Banks, the Treasury holds some currency in its own vaults. Changes in these holdings affect bank reserves just like changes in the Treasury's deposit account at the Reserve Banks. When Treasury holdings of currency increase, they do so at the expense of deposits in banks. As cash holdings of the Treasury decline, on the other hand, these funds move into bank deposits and increase bank reserves.

Other Deposits in Reserve Banks

Besides U.S. banks, the U.S. Treasury, and foreign central banks and governments, there are some international organizations and certain U.S. government agencies that keep funds on deposit in the Federal Reserve Banks. In general, balances are built up through transfers of deposits held at U.S. banks. Such transfers may take place either directly, where these customers also have deposits in U.S. banks, or indirectly by the deposit of funds acquired from others who do have accounts at U.S. banks. Such transfers into "other deposits" drain reserves.

When these customers draw on their Federal Reserve balances (say, to purchase securities), these funds are paid to the public and deposited in U.S. banks, thus increasing bank reserves. Just like foreign customers, these "other" customers manage their balances at the Federal Reserve closely so that changes in their deposits tend to be small and have minimal net impact on reserves.

Nonfloat-Related Adjustments

Certain adjustments are incorporated into published data on reserve balances to reflect nonfloat-related corrections. Such a correction might be made, for example, if an individual bank had mistakenly reported fewer reservable deposits than actually existed and had held smaller reserve balances than necessary in some past period. To correct for this error, a nonfloat-related as-of adjustment will be applied to the bank's reserve position. This essentially results in the bank having to hold higher balances in its reserve account in the current and/or future periods than would be needed to satisfy reserve requirements in those periods. Nonfloat-related as-of adjustments affect the allocation of funds in bank reserve accounts but not the total amount in these accounts as reflected on Federal Reserve Bank and individual bank balance sheets. Published data on reserve balances, however, are adjusted to show only those reserve balances held to meet the current and/or future period reserve requirements.

Other Federal Reserve Accounts

Earlier sections of this booklet described the way in which bank reserves increase when the Federal Reserve purchases securities and decline when the Fed sells securities. The same results follow from any Federal Reserve expenditure or receipt. Every payment made by the Reserve Banks, in meeting expenses or acquiring any assets, affects deposits and bank reserves in the same way as does the payment to a dealer for government securities. Similarly, Reserve Bank receipts of interest on loans and securities and increases in paid-in capital absorb reserves.