Federal Funds and Repurchase Agreements

The markets for Federal funds and repurchase agreements (RPs) are among the most important financial markets in the United States. Using these instruments, many banks, large corporations, and nonbank financial firms trade large amounts of liquid funds with one another for periods as short as one day. Such institutions provide and use much of the credit made available in the United States and typically manage their financial positions carefully and aggressively. The interest rate on overnight (one day) Federal funds measures the return on the most liquid of all financial assets, and for this reason is critical to investment decisions. That is, financial managers compare this rate to yields on all other investments before choosing the combinations of maturities of the financial assets in which they will invest or the term over which they will borrow.

The Federal funds market is also important because it is related to the conduct of Federal Reserve monetary policy. The interest rate on Federal funds is highly sensitive to Federal Reserve actions that supply reserves to member commercial banks, and the rate influences commercial bank decisions concerning loans to business, individual, and other borrowers. Moreover, interest rates paid on other short-term financial assets —commercial paper and Treasury bills, for example— usually move up or down roughly in parallel with the Federal funds rate. Thus the rate also influences the cost of credit obtained from sources other than commercial banks

Frequently, the Federal funds market is described as one in which commercial banks borrow and lend excess reserve balances held at the Federal Reserve, hence the name Federal funds. While banks often use the Federal funds market for this purpose, growth and change in the market have made this description highly oversimplified. Many active market participants do not hold balances at the Federal Reserve These include commercial banks that are not members of the Federal Reserve System, thrift institutions, certain agencies of the United States Government, and branches and agencies of foreign banks operating on United States soil. Moreover, this broad set of market participants borrows and lends amounts far beyond the modest total of excess reserve balances. Currently, borrowings of Federal funds outstanding average $45 billion to $50 billion daily

A closely related market for short-term funds is the market for RPs involving United States Government and Federal agency securities[1] This market includes many of the same participants that trade Federal funds, but it also includes large nonfinancial corporations, state and local governments, and dealers in United States Government and Federal agency securities. The RP market has expanded rapidly of late, and its workings are perhaps less widely known than those of the Federal funds market.

Although the Federal funds and RP markets are distinct, they share many common features Both, for example, primarily involve transactions for one business day, although transactions with maturities of up to several weeks are not uncommon In both markets, commercial banks that are members of the Federal Reserve System can acquire funds not subject to re-

[1] The term "Federal agency" is used here in its popular meaning, which refers both to Federal agencies, such as the Commodity Credit Corporation, and to Federally sponsored quasi-public corporations, such as the Federal National Mortgage Association

serve requirements. A lesser known but nevertheless very important common element is the fact that transactions in both markets are settled in what are known as "immediately available funds". Indeed, some observers see the two markets as so closely related that they might appropriately be grouped together under a broader designation—"the markets for short-term immediately available funds". For an elaboration of the nature and uses of immediately available funds, see pages 36 and 37.

The main purpose of this article is to review major recent developments in the markets for Federal funds and RPs. The most significant changes are the dramatic growth of the volume of transactions and of the number and type of institutions active in these markets. At the same time, the language of the market has been changing, mostly because of the evolution in market practices. It is, therefore, necessary to begin with definitions of some terms most frequently used by market participants

Federal funds

Federal funds transactions are frequently described as the borrowing and lending of "excess reserve" balances among commercial banks[2] This description of Federal funds was accurate years ago but is now seriously deficient, even though it still appears in the financial press While such commercial bank use of the market persists in substantial volume, Federal funds transactions are no longer confined to the borrowing and lending of excess reserve balances Moreover—and this is a key point—a Federal funds transaction does not necessarily involve transfer of a reserve balance, even though such a transfer usually does occur For example, a commercial bank can borrow the "correspondent balances" held with it by other banks The execution of such a transaction involves only accounting entries on the books of both the borrower and lender.

The most useful description of Federal funds has several elements, some based on regulations, others simply on market convention In practice, Federal funds are overnight loans that are settled in immediately available funds Only a limited group of institutions are in a position to borrow in this fashion, mostly commercial banks and some other financial institutions such as agencies of foreign banks. If a member bank borrows Federal funds, Federal Reserve regulations do not require it to hold reserves against the borrowing, as it must for funds acquired in the form of demand or time deposits. But, under Federal Reserve regulations, member banks are permitted to borrow reserve-free funds only from a certain group of institutions. This group includes other commercial banks, Federal agencies, savings and loan associations, mutual savings banks, domestic agencies and branches of foreign banks, and, to a limited degree, Government securities dealers Market convention has adjusted to these regulatory restrictions, and a Federal funds borrowing has come to mean an overnight loan not just between two commercial banks but between any two of the group of institutions from which member banks may borrow free of reserve requirements. A savings and loan association, for example, can lend Federal funds to an agency of a foreign bank.

This description makes it easy to see that the Federal funds market is by no means limited to the lending of excess reserves. Many of the institutions that participate in the market are not members of the Federal Reserve System and, therefore, do not have reserve accounts. Moreover, the excess reserves of individual member banks are normally very small in relation to their total reserves The excess reserves characterization of Federal funds borrowing suggests that total activity in the market is likewise rather modest While this was once true, it no longer is In recent years, daily outstanding borrowings by member banks in the Federal funds market have approached $50 billion, or about 40 percent more than the *total* reserves they hold. Some individual banks continually borrow as much as four times their required reserves in the Federal funds market.

Fairly recently, banks have begun to borrow immediately available funds for periods longer than a single business day This form of borrowing was developed by agencies of Canadian banks located in the United States The transactions are arranged among the same institutions which participate in the overnight market and are similar in all respects except maturity For these reasons, the transactions have come to be called "term Federal funds" transactions.

The Federal funds and term Federal funds transactions described above are normally "unsecured". This means that the lending institutions have no guarantee of repayment other than the promise of the borrower For this reason, unsecured Federal funds transactions are done only by institutions that enjoy a very high degree of mutual confidence At times, however, a lender of Federal funds will ask that the transaction be "secured" This means that the borrower must pledge an asset, usually a Government or

[2] A fundamental difficulty with this notion of Federal funds borrowing is that the use of the term "excess reserves" is very imprecise No distinction is made between the actual excess reserves held in a bank's reserve account and what might be called "potential" excess reserves Clearly an individual bank can control the amount of excess reserves it has available to sell in the Federal funds market most easily by selling assets and converting the proceeds into balances at a Federal Reserve Bank In this sense, the potential excess reserves of an individual bank are nearly as large as its total earning asset portfolio

Federal agency security, as "collateral" against the loan. The borrower may either set aside the collateral in a custody account or actually deliver it to the lender. However, secured Federal funds transactions are not very common.[3]

Repurchase agreements

A repurchase agreement (RP) is an acquisition of immediately available funds through the sale of securities, together with a simultaneous agreement to repurchase them at a later date RPs are most commonly made for one business day, though longer maturities are also frequent. The funds that a member bank acquires in this manner are free of reserve requirements so long as the securities involved are those of the United States Government or Federal agencies When an RP is arranged, the acquirer of funds agrees to sell to the provider of funds United States Government or Federal agency securities in exchange for immediately available funds. At the maturity of the agreement, the transaction is reversed, again using immediately available funds Market insiders use different terms to describe the RP, including "repo" and "buy back"

Those who supply or acquire funds view RPs as involving little risk. Transactions are usually arranged only among institutions enjoying a high degree of confidence in one another. In addition, contracts are usually of very short maturity. Protection against any residual risk can be incorporated in an RP contract by establishing a differential—called a margin—between the quantity of funds supplied and the market value of the securities involved The margin can protect either party to the transaction, but not both. It protects the supplier of funds if the value of the securities exceeds the quantity of funds supplied. It protects the taker of funds if the securities are of less value than the amount of funds supplied. The supplier of funds generally considers the consequences of default by the other party to be minor, because the securities acquired are obligations either issued or guaranteed by the Federal Government Another element of risk arises from the possibility that the price of the securities may fall between the time the RP is arranged and the time of any default. For this reason, the margin is most often set to protect the supplier of funds.

This article is concerned with RPs involving only United States Government and Federal agency securities, but it should be noted in passing that an RP can involve any sort of asset which the supplier of funds is willing to accept. RPs involving other assets are executed to a limited degree, for example using certificates of deposit of large banks.

Transactions are executed in several ways, but two approaches are most common. One approach is for the securities to be both sold and repurchased at the same price, with charges representing the agreed-upon rate of return added to the principal at the maturity of the contract The second approach involves setting a higher price for repayment than for selling.

The term "reverse repurchase agreement" is sometimes thought to be quite different from an RP. In fact, it refers to exactly the same transaction viewed from the perspective of the supplier of funds rather than the recipient. Compare the two views of the transaction: The recipient of funds sells a security to obtain funds, and "repurchases" it at maturity by redelivery of funds. In a reverse RP, the supplier of funds buys a security by delivering funds when the agreement is made and "resells" the security for immediately available funds on maturity of the contract. From the perspective of the party acquiring funds, the term "repurchase agreement" seems apt, and from that of the supplier of funds, the transaction is exactly the "reverse" However, whether funds are acquired or supplied, the transaction is usually referred to in the marketplace simply as an RP

The markets for Federal funds and RPs

There is no central physical marketplace for Federal funds, the market consists of a loosely structured telephone network connecting the major participants. These participants, as already mentioned, include commercial banks and those other financial institutions from which, under Federal Reserve regulations, member banks can buy reserve-free Federal funds The market also includes a small group of firms that act as brokers for Federal funds. These firms neither lend nor borrow but arrange transactions between borrowers and lenders in exchange for a very small percentage commission

All major participants employ traders These individuals make the actual telephone contact on behalf of lending or borrowing institutions, making offers to borrow or lend at specific interest rates They also negotiate any differences between the rate bid by a borrower and that offered by a lender. Transactions are usually executed in lots of $1 million or more Frequently, but not always, settlement of the transaction requires transfer of funds over the Federal Reserve wire transfer network, first when the agreement is reached and again the next day when repayment is made

Many banks, particularly medium-sized and large ones, frequently borrow and lend Federal funds on

[3] Banks chartered in certain states face regulations that require collateral to be provided for the portion of an individual Federal funds transaction in excess of some proportion of the lender's combined capital and surplus

IMMEDIATELY AVAILABLE FUNDS

The Means of Settlement for Transactions in Federal Funds and RPs

An essential feature of both Federal funds and RPs is that transactions are settled in "immediately available funds". Therefore it is necessary to specify precisely what such funds are. Immediately available funds are two related but distinct types of financial claims: (1) deposit liabilities of Federal Reserve Banks and (2) certain "collected" liabilities of commercial banks that may be transferred or withdrawn during a business day on the order of account holders.

Federal Reserve Banks, of course, are "banks for banks", and deposits are held there mainly by commercial banks that are members of the Federal Reserve System in order to satisfy the reserve requirements imposed on members. These deposits have special features, however. Along with currency and coin, they are the only form of money created directly by a Federal authority. This reflects the fact that these deposits are the direct liabilities of the Federal Reserve Banks. In addition, the Federal Reserve operates a nationwide electronic communications network over which these deposits can be transferred anywhere in the country within a business day. Deposits at Federal Reserve Banks are therefore termed immediately available funds, since they can be converted to cash or transferred anywhere in the United States within a single day on demand.

Immediately available funds also consist of certain collected liabilities of commercial banks. This group of liabilities include a portion of a bank's demand and time deposits, as well as certain other liabilities which are used very much like deposits but which are classed separately for accounting or regulatory reasons. These liabilities are termed immediately available funds because commercial banks permit them to be withdrawn in cash or used for payment without question within a single day. The immediate and unquestioned use of these bank liabilities for payment depends on the fact that they are collected, a feature which can be illustrated by describing how an individual's checking deposit with a bank becomes collected.

Typically, an individual increases his bank balance by depositing checks payable to him drawn on the same or some other bank. When the check is drawn on some other bank, the individual is normally unable to withdraw or otherwise use the funds on the same day that the deposit is made. Frequently, several days elapse, during which time the credit to the depositor's account is only provisional and the check is in the process of being collected. That is, it is cleared and then payment is received by the depositor's bank from the bank on which the check is drawn. Payment may be received in any one of several forms: a deposit at a Federal Reserve Bank, a collected deposit at another commercial bank, or conceivably in currency or coin Whatever the case, once collected, the individual's balance can be transferred on his order.

Alternatively, a depositor may receive payment to his account in immediately available funds. In this case, the funds can be withdrawn in cash or otherwise used on the day of receipt with no intervening period for collection. For credit to be received immediately, the deposit must be made in some form other than the common check. The most obvious alternative is cash, used frequently for small deposits but only rarely for sizable transactions because of the risk of loss.

More commonly, when the depositor wishes to receive immediately available funds, the transfer is accomplished through the Federal Reserve electronic communications network. This network is used either within or between Federal Reserve Districts. Any member bank may send or receive immediately available funds—in the form of reserve deposits—to or from any other member bank, and the entire transfer takes place within one business day. The use of the Federal Reserve network can be accomplished indirectly by individuals or institutions other than member banks. This requires the transfer of a depositor's collected balance from one member bank to another, in effect using a reserve balance at the Federal Reserve as a means of payment between banks If the transaction results in a transfer of funds from one account to another within a single bank, only balance-sheet entries are affected since there need be no actual movement of funds over the Federal Reserve network.

Immediately available funds can be used by a customer of a commercial bank to make payment in any sort of transaction. Among the principal users are sizable financial, business, and government institutions. In practice, such funds are used only for large transactions including, for example, payment for purchase of a financial asset, for raw materials, or for a construction contract. In all these cases, immediately available funds are used as a means of payment because the parties to the transaction wish to use them Thus, not all transactions involving the use of immediately available funds are related to either the Federal funds or the repurchase agreement markets.

the same day, thereby performing an intermediary function in the Federal funds market. Such banks channel funds from banks with lesser need for funds to banks with greater need for them, frequently borrowing from smaller banks and lending to larger ones. Over the past decade, more medium-sized regional banks have begun to act as intermediaries. In addition, many more banks during this period have come to borrow significantly more than they lend; that is, they have become continual net borrowers.

In recent years a growing portion of the market has consisted of large banks' borrowing of correspondent balances from small banks Historically, these correspondent balances earned no interest. But both large and small banks have come to regard correspondent relationships as convenient bases for arranging Federal funds transactions. Small banks now intentionally accumulate large balances, selling off daily the excess not needed for the clearing of checks or for other purposes. In such cases, it is not necessary to transfer funds over the Federal Reserve wire transfer network, and reserve balances need not change ownership. Rather, bookkeeping entries are posted by both the borrower and lender to reflect the fact that a noninterest-bearing correspondent demand balance has been converted into a Federal funds borrowing

No central physical marketplace for repurchase agreements exists either. Transactions are arranged by telephone, largely on a direct basis between the parties supplying and acquiring funds but increasingly through a small group of market specialists These specialists, mostly Government securities dealers, arrange a repurchase agreement with one party to acquire funds and a reverse repurchase agreement with another party to supply funds. They earn a profit by acquiring funds more cheaply than they supply them.

Large banks and Government securities dealers are the primary seekers of funds in the RP market Banks use the market as one among many sources of funds, but have a distinct advantage over other institutions as acquirers of funds because they hold large portfolios of United States Government and Federal agency securities. Moreover, because the supplier of funds receives securities, and because member banks acquiring funds need not hold reserves against RPs regardless of the source of funds, the RP market attracts a wider array of participants than does the Federal funds market Government securities dealers use the market as a source of funds to finance their holdings of Government and agency securities Many types of institutions supply immediately available funds in this market, but large nonfinancial corporations and state and local governments dominate

Typically, participants on both sides of the RP market have lists of customers with whom they routinely do business. Each of the largest participants uses an "RP trader", an individual whose job it is to contact other traders and to negotiate the best arrangements possible A trader begins the day with information on the amount of funds he must supply or acquire His objective is to arrange transactions at the maximum return obtainable if he is to provide funds and at the minimum cost possible if he is to acquire funds

With these definitions and descriptions in mind, it is possible to discuss in some detail the roles of the major institutional participants in the markets for immediately available funds. It is appropriate to begin with an examination of the role played by commercial banks, who are currently the most important of those who obtain funds in these markets Moreover, the reserve position adjustments that banks make in the markets for immediately available funds are important links in transmitting the effects of monetary policy throughout the financial system

Commercial banks and immediately available funds

Commercial banks are the largest and most active participants in the markets for immediately available funds Banks use these markets for several purposes, among which is the day-to-day adjustment of reserve positions Large banks have made such adjustments in the Federal funds market for over fifty years and continue to do so in substantial volume But commercial bank use of both the Federal funds and the RP markets is best understood in the much broader context of how banks obtain and use funds In addition, bank operations in the Federal funds and RP markets have been heavily influenced by changes in the regulations that govern bank activities

The traditional view of banks has been that they accept deposit liabilities from customers and use the funds to lend or invest. In the process, they make a profit by earning more in interest on loans and investments than their cost of operations, including interest they pay on deposits This approach has undergone significant modification over the past decade at least, particularly at large banks. In place of a passive stance, banks have become active solicitors of funds in the open markets Moreover, they have developed liabilities in addition to standard demand and savings accounts. Fifteen years ago, for example, banks developed and began to exploit the negotiable certificate of deposit (CD). More recently, Euro-dollars, commercial paper issued by bank holding companies, and other instruments have been developed and used as sources of funds. Large banks set a target for the total amount of liabilities they will attempt to secure, basing that target on the total of loans and investments thought to be profitable. The overall approach, summarized here in its barest outlines, is generally known as "liability management".

The spread of the practice of liability management has had two related effects on commercial bank activity in the Federal funds market. First, instead of just engaging in relatively small trades for the purpose of making daily reserve adjustments, today banks may rely on this market to meet a desired proportion of liabilities. Thus, they at times borrow amounts that are large relative to their total assets or liabilities. Second, instead of individual banks lending as often as they borrow, some banks are continual net borrowers, while others are continual lenders. The borrowers use the market both to offset the impact on their reserve holdings of day-to-day inflows and outflows of deposits and as an ongoing source of funds to finance loans and investments. The lenders, usually smaller banks, treat Federal funds as a highly liquid interest-earning short-term asset.

Origins of the Federal funds market

Commercial banks were entirely responsible for the origination and early development of the Federal funds market. The market began among a small number of New York City banks in the early 1920's. Some banks frequently found themselves in reserve deficit positions and, therefore, were forced to borrow from the Federal Reserve discount window. Others frequently had unanticipated excess reserve holdings, and these balances did not earn any interest. Under these circumstances, an obvious opportunity for mutual benefit existed, and bank managers devised a mechanism to realize these benefits. They exchanged drafts drawn on Federal Reserve balances and so created the Federal funds market. A lending bank made payment by delivering a draft on a reserve account on the day a borrowing was arranged. Such drafts, in contrast to a common check, could be collected on the day they were presented to the Federal Reserve. To accomplish the repayment, the borrowing bank gave a clearinghouse check made out to the lender to be collected the following day. The repayment check was for a slightly larger sum to reflect the interest due.

This practice spread to other cities in subsequent years, but the amounts traded remained small, and the markets remained largely confined to local areas. Only large banks participated in the market, and transactions were undertaken only to adjust for relatively small deficits or excesses in reserves. Many individual banks found that they were able to lend in the market one day, but had to borrow the next.

Toward the end of the 1920's, the market began to expand to include interregional as well as intracity transactions. Trading of funds between regions was made possible by the Federal Reserve wire transfer facilities, which permitted the movements of funds from one city to another without the use of drafts. By this time, daily borrowing reached about $250 million With the 1929 stock market crash and the ensuing depression, however, interest rates fell substantially and banks developed a strong preference for holding cash, reflected in large holdings of excess reserves. These developments cut short the growth of the Federal funds market, but the brief appearance of wire trading of Federal funds in the late 1920's set the stage for rapid development of the market after World War II.

Federal funds in the postwar era

In the three decades since the end of World War II, the Federal funds market has changed in at least two fundamental respects. First, both the number of banks participating in the market and aggregate trading volume in Federal funds have grown enormously. Second, most large banks, which formerly alternated between borrowing and lending, have become continual net borrowers, while small banks not previously active in the market have entered the market, primarily as continual lenders.

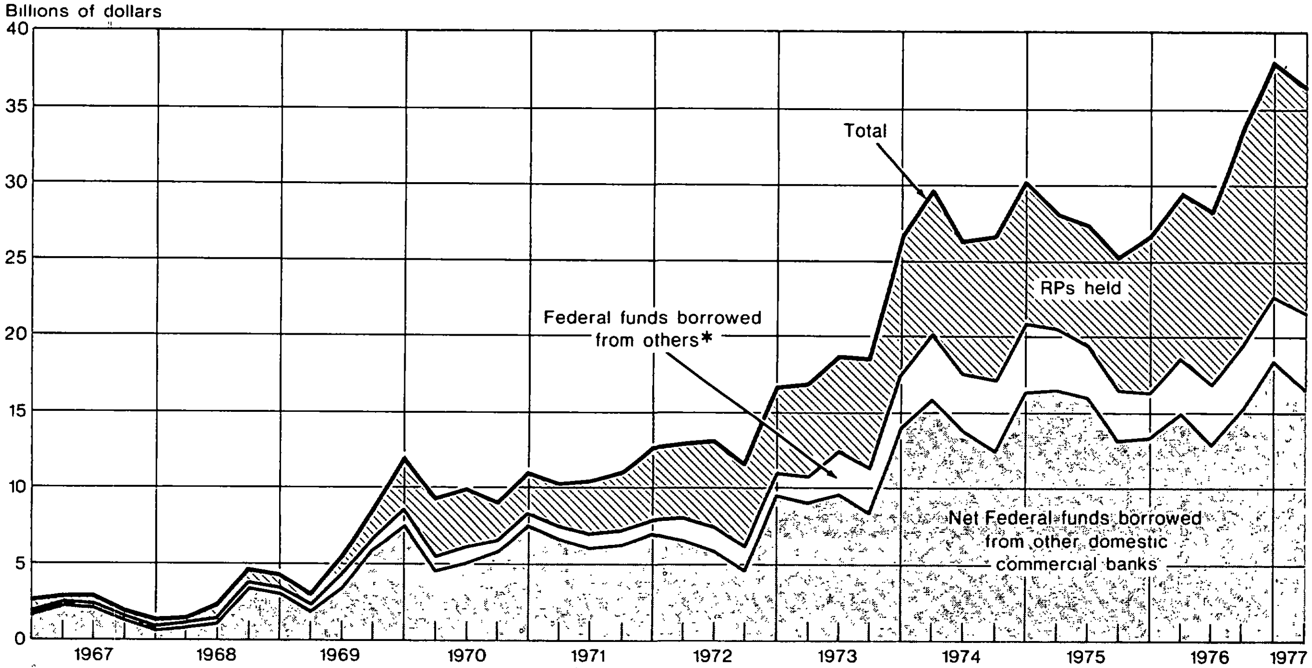
The changing role of the large banks is evidence that liability management has been added to daily reserve position adjustment as a motive for participation in the Federal funds market. A continuous and steady supply of funds is available to large banks once they have established market contacts with sellers. As a result, Federal funds have become an important source of liabilities because of their availability and the low cost of executing transactions over the Federal Reserve wire network, and because these funds are not subject to reserve requirements or interest rate ceilings.

Smaller banks have been introduced to the market primarily through correspondent relationships with large banks. Immediately after World War II, small banks held relatively large amounts of their assets in cash. The practice was understandable at that time, because interest rates were very low and because a high value was placed on liquidity due to the vivid memories of the prewar depression. Interest rates began to rise in the 1950's, however, increasing the interest earnings foregone by holding large amounts of cash. With large banks willing to borrow and interest rates rising, a few small banks began to lend their cash balances to large banks in the form of Federal funds. Such overnight lending provided virtually the same liquidity as cash.

By the early 1960's, banks of all sizes and types had become familiar with the advantages of participation

Chart 1

Federal Funds and RPs Held by 46 Large Domestic Commercial Banks



*Includes borrowings from those institutions other than domestic commercial banks from which member banks may borrow free of reserve requirements

in the Federal funds market. Two major rulings by bank regulators in these years also served to encourage trading of Federal funds

In 1963, the Comptroller of the Currency issued rulings that eliminated restrictions on the amounts that a nationally chartered bank could lend to any one bank. Formerly, unsecured lending to a single borrower in Federal funds had been restricted to 10 percent of the lending bank's combined capital and surplus. Though this limit applied to all nationally chartered banks, it effectively restricted the activities only of the small banks in this group. The 1963 ruling declared Federal funds transactions to be purchases and sales, not borrowings and lendings. In so ruling, the Comptroller effectively removed the restrictions that had kept small banks from placing relatively large amounts of funds in the Federal funds market.

In 1964, a ruling by the Federal Reserve Board made it clear that member banks could legally purchase correspondent balances of nonmember banks as Federal funds. Prior to this ruling, the practice of purchasing correspondent balances had not been as widespread

Together these rulings served to encourage the sale of Federal funds by small banks, and to reinforce the spread of liability management techniques among large correspondent banks. Small banks were now in a position to ask their correspondents to engage in Federal funds transactions under the threat that their funds would otherwise be moved to a competitor. Faced with a potential loss of balances, large correspondent banks began to buy Federal funds regularly in large amounts from small banks.

The net purchases of Federal funds by large commercial banks have increased enormously since the regulatory changes. But as the lower two segments of Chart 1 show, the growth has occurred sporadically. Spurts of rapid growth in this market have generally taken place during periods when short-term interest rates were either rising rapidly or at high levels. The Federal funds rate, as Chart 2 shows, has reached several postwar peaks in the last fifteen years. At such times, large banks sought funds most aggressively. They put considerable effort into developing new correspondent relationships and into attracting larger amounts of funds from existing ones. Smaller banks were induced to increase their lending by the high interest rates offered The volume of funds traded in the market declined somewhat during periods of lower short-term interest rates, but once developed, the correspondent relationships have tended to remain active.

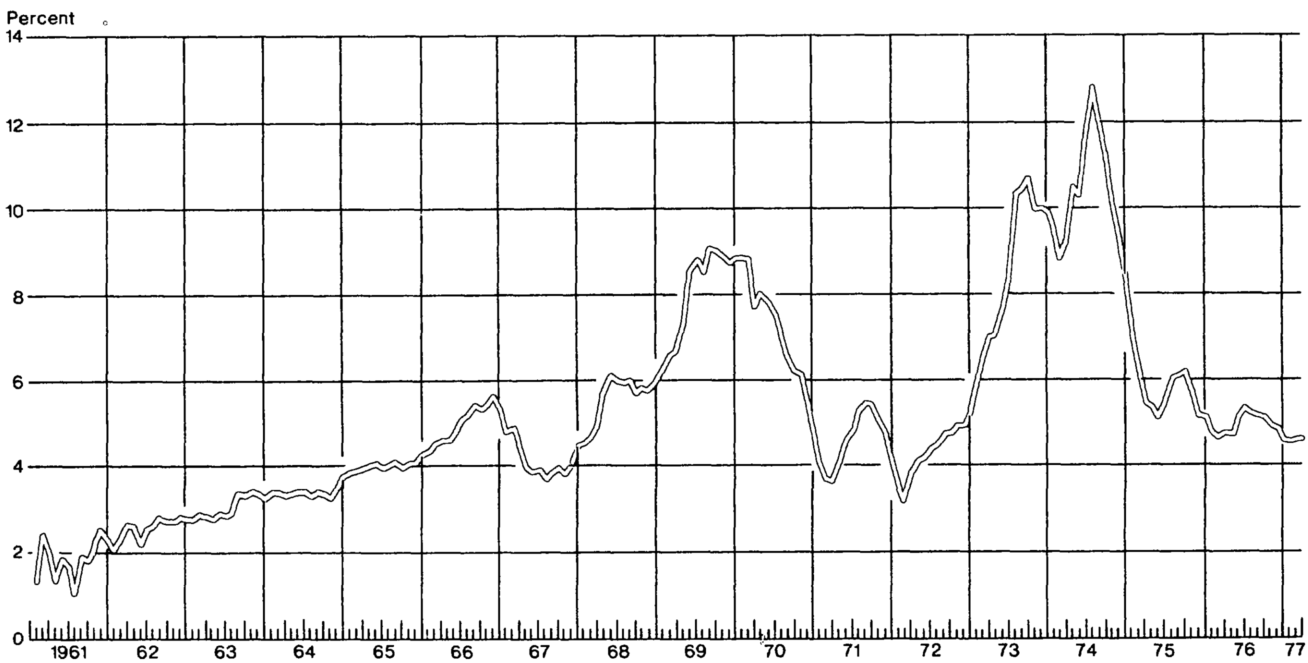
The rapid postwar development of the Federal funds market led to a reversal in 1965 of the long-standing relationship between the Federal funds rate and the Federal Reserve discount rate. Prior to that time, the discount rate had served as an effective ceiling on the Federal funds rate. This was because many banks borrowed Federal funds only occasionally and in relatively small amounts, and were therefore able to accomplish such short-term adjustments at the discount window as an alternative to Federal funds borrowing This use of the discount window occurred whenever the Federal funds rate approached the discount rate As banks turned to the discount window, demand for Federal funds diminished, and upward rate pressures slackened.

With the rise in liability management practices in the early 1960's, banks borrowed Federal funds more frequently and in larger amounts. Such borrowing could not be done at the discount window, which has always been available only for short-term adjustments by individual banks As a result, banks using the Federal funds market for liability management purposes continued bidding for Federal funds as the rate rose to and exceeded the discount rate This happened for the first time in 1965, when tightening monetary policy pushed the Federal funds rate upward The Federal funds rate has been above the discount rate for much of the period since.

Another significant change in the market came in 1970 Federal Reserve Regulation D, which specifies those deposits of member banks that are subject to reserve requirements, had previously exempted Federal funds borrowing from reserve requirements so long as the lender was a commercial bank. An amendment to the regulation, along with a formal interpretation, extended the exemption to several other types of nonbank institutions, including agencies of the United States Government, savings and loan associations, mutual savings banks, as well as agencies and branches of foreign banks operating in this country By 1970, some banks had already begun to borrow Federal funds from these nonbank institutions, and the regulatory change removed any doubt that the practice was acceptable. This change was particularly important, for it provided explicit regulatory approval for banks to borrow Federal funds from selected lenders outside the banking community, just as banks do by issuing CDs, demand de-

Chart 2

Interest Rate on Federal Funds



posits, or any other type of liability.

Commercial banks are able to obtain immediately available funds through repurchase agreements as well as through Federal funds transactions. The growth of RP activity by commercial banks, like that of Federal funds, has been influenced by regulatory changes. In 1969, Federal Reserve Regulation D was amended to restrict the exemption from reserve requirements only to those funds raised through RPs involving United States Government or Federal agency securities. This action practically eliminated bank trading in those RPs which involve other sorts of financial claims. At the same time, however, it removed any question about the status of RPs involving Government securities.

Recent developments in the banking sector

Some rather dramatic events occurred in the markets for immediately available funds beginning in 1973. Monetary policy was tightened that year in response to rapid inflation and a booming economy. The tightening placed severe pressure on the banking system—which had a limited supply of funds and faced strong demand for loans, particularly from businesses. Under these circumstances, banks with a strong liability management orientation turned to any and all potential sources of funds. In early 1973, large banks began to borrow heavily in the CD market This borrowing was facilitated by the suspension in May 1973 of interest rate ceilings on all maturities of large denomination CDs. From early 1973 through mid-1974, CD borrowing jumped by about $38 billion. Large banks sought short-term open market funds to meet loan demands much more heavily than before, taking in about $18 billion of additional Federal funds and RPs during the same period.

The United States economy went through a sharp recession between late 1973 and early 1975. Demand for credit from commercial banks as well as other lenders remained strong for a time, but progressively weakened through the later stages of the downslide and into the recovery which began in mid-1975. With loans contracting, large banks gradually reduced their lending rates and also sought liabilities with lessened intensity. Their CDs dropped sharply, falling by $28 billion between early 1975 and late 1976. Commercial bank acquisition of Federal funds and RPs, however, did not follow the pattern set in the CD market. Holdings of these funds declined by only about $4 billion in late 1974 and 1975, then grew by about $17 billion in 1976. This reflected a continuing basic growth of the markets for Federal funds and RPs.

The basic growth also was manifest in the continuing entry of banks into the markets for immediately available funds. Call reports of member banks of the Federal Reserve System show that in 1969 about 55 percent of all member banks either bought or sold Federal funds. By 1976, the proportion of member banks that was in the market had climbed to 88 percent. Most of the new entrants to the market were small banks

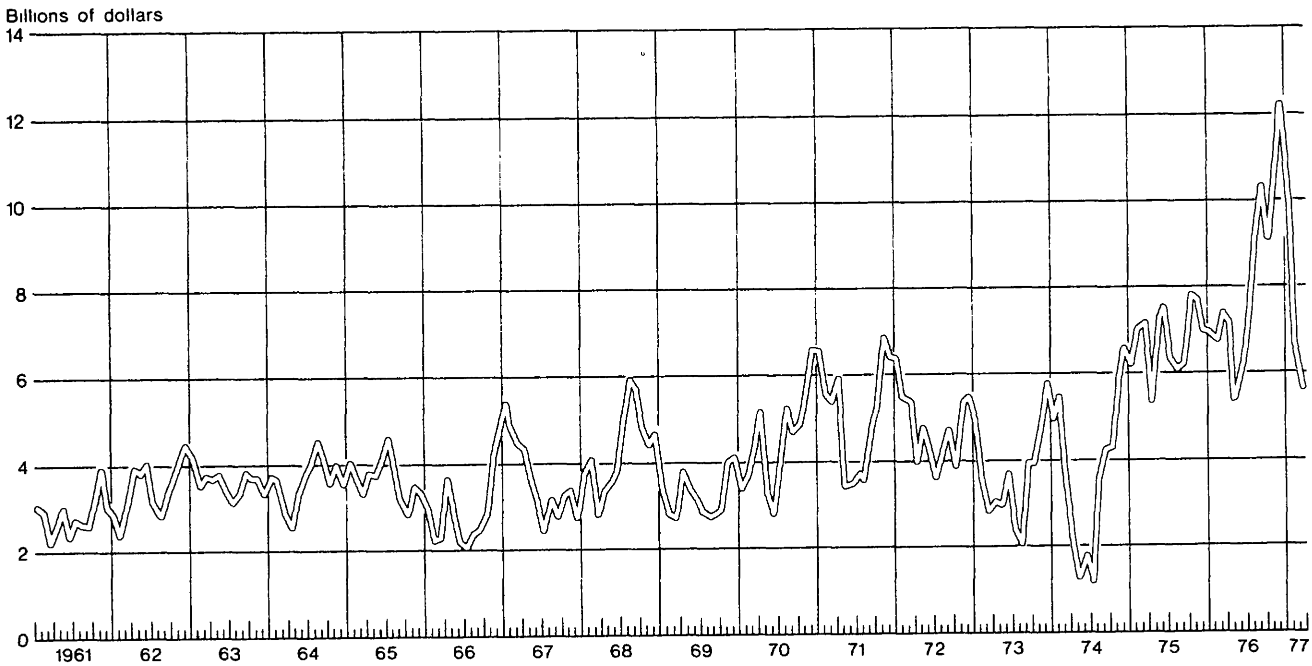
Thus, even in the early 1970's many commercial banks were newcomers to the markets for immediately available funds. These markets broadened and deepened in stages which typically occurred in periods of high interest rates. The concentration of entry in such periods is due at least partially to sizable start-up expenditures for trading in immediately available funds. Start-up costs are incurred mostly by borrowers, and mainly involve expenses of finding and establishing a trading relationship with potential suppliers of funds. The expenditures are more easily justified when interest rates (and potential earnings) are high. Once established, trading relationships tend to remain active even after interest rates fall.

Other developments also contributed to the greater acquisition of Federal funds and RPs by banks during 1975 and 1976 In 1974, the Treasury changed the way it handled its deposits at commercial banks (Tax and Loan Accounts) Such accounts had been held at banks for decades. Beginning in August 1974, however, most of these balances were transferred to the twelve Federal Reserve Banks. This reduced the volume of Government and agency securities that commercial banks were required to hold as pledged collateral against Treasury deposits. Once free from this purpose, these securities were available for use in the market for repurchase agreements.

With loan demand light in 1975, commercial banks began to accumulate large amounts of additional Government and agency securities. The process was significantly aided by the large amounts of new Government securities the Treasury sold in order to finance the sizable deficits the Federal Government was running. These securities were heavily used by large banks to acquire funds in repurchase agreements since they could be financed in this way at a cost below their interest yield At about the same time, the effects of the recession led corporations to reduce inventories and expenditures for fixed plant and equipment. This enabled corporations to begin to rebuild their liquidity, partly through the purchase of Government securities and also by supplying funds to the RP market. The use of RPs grew rapidly as corporations increasingly came to view repurchase agreements as income-generating substitutes for demand deposits at commercial banks.

Quite separately, small banks and nonbank financial institutions were also increasing their offerings of immediately available funds. Both types of insti-

Chart 3
Dealer Positions in United States Government and Federal Agency Securities



tutions experienced a decline in loan demand from corporate and other borrowers with the onset of the recession But individuals stepped up their savings in the form of deposits with small banks and with non-bank thrift institutions With increasing deposit inflows and declining demand for loans, these institutions looked for alternative investments and became active suppliers of immediately available funds.

The role of Government securities dealers

Government securities dealers are the second major group of participants active in the markets for immediately available funds Dealers are in the markets primarily to acquire funds, but they also supply funds under some circumstances In some ways dealers act as financial intermediaries, but their operations also have speculative features. Dealers earn income in two ways: "carry income" and "trading profits" Carry income (or loss) refers to the difference between the interest yield of a dealer's portfolio and the cost of the funds which support that portfolio. Trading profits refer to the gain (or loss) a dealer earns by selling securities for more (or less) than he paid for them.

Government securities dealers often hold sizable positions in United States Government and Federal agency securities. These positions are highly leveraged in that the dealers borrow a very high percentage of the cost of purchasing securities The search for low cost money to finance his position is a central part of the operations of any successful Government securities dealer. This search led the dealer community to promote the use of the repurchase agreement shortly after World War II. RPs were offered mainly to large corporations, which found them attractive because the short maturities of the RP contracts made them much like demand deposits, with the added advantage of earning income The use of RPs by dealers has expanded ever since, in part because more corporations and others have come to accept the repurchase agreement as a reliable short-term money market instrument Dealers have also come to vary the size of their positions much more than before, in response to the greater variability of interest rates and securities prices in recent years. These larger swings in position, which are evident in Chart 3, have been accompanied by higher average positions, which in turn have contributed to the increased use of RPs by dealers

Because of greater interest rate variability, and in an effort to broaden their activities, Government securities dealers have developed new trading techniques and expanded the use of others. One of the greatly expanded techniques enables dealers to act essentially as brokers in the RP markets They obtain funds in exchange for securities in one transaction and simultaneously release funds in exchange for securities in a separate transaction. When the maturities of the two transactions—one a repurchase agreement and the other a reverse repurchase agreement—are identical, the two are said to be "matched" The dealer profits by obtaining funds at a cost slightly lower than the return he receives for the funds he supplies. After arranging such a pair of transactions, a dealer is exposed to credit risk (the possibility of default), but not to market risk (changes in the value of the portfolio due to changes in market prices).

A commonly used variant of the "matched" agreement gives the dealer greater opportunity to try to take advantage of movements in interest rates A dealer may deliberately not "match" the maturity of an RP with the maturity of a reverse RP. Usually the RP is for a period shorter than the reverse RP, establishing what is called a "tail". The "tail" refers to the difference in the maturities of the two transactions If during this period the dealer is able to refinance the reverse RP with an RP at a lower cost, he makes a profit; if not, he loses money

Another use of the reverse RP has been developed more recently. Reverse RPs are now used frequently to facilitate "short sales" of Government and Federal agency securities[4] In the past, dealers wishing to establish such positions had to borrow securities from commercial banks, usually at an interest fee of 50 basis points (½ percent). Now dealers often acquire securities elsewhere under reverse RPs and frequently through this device reduce the cost of obtaining securities for the purpose of short sales

Use of the reverse RP to facilitate the short sale has led to the appearance of a new subsector of the repurchase agreement market, known as the "specific issue market". The subsector has developed because, for purposes of a short sale, a dealer tries to obtain the exact issue whose price he expects to fall. In a usual reverse RP, the specific securities to be exchanged are rarely discussed (though their maturity should exceed that of the reverse RP), since the parties to the agreement are primarily concerned with the cost of the money involved The placement of securities in the specific issue market is advantageous for both principals to the transaction Since it is apparent that the dealer is interested in a particular issue, the holder of the securities is able to negotiate with the dealer and can often get funds at a slightly lower cost than if he were to place the securities in the overall RP market.

Corporations and the RP market

Up to this point, the analysis has concentrated on the major demanders of Federal funds and RPs The discussion of major nonbank suppliers begins with nonfinancial corporations. They have been supplying funds through RPs against Government and agency securities for about thirty years

The principal reason corporations hold cash and other short-term liquid assets is to bridge timing gaps between receipts and expenditures Large quantities of funds are accumulated in anticipation of payments for dividends, corporate taxes, payrolls, and other regular expenses In addition, corporations also accumulate short-term liquid assets in anticipation of expenditures for plant and equipment. In general, corporate liquidity is related to economic conditions and expectations about the future course of the economy and interest rates Liquidity is often low—*i.e.*, corporations have small amounts of liquid assets and large amounts of short-term borrowing—in periods of rapid economic expansion. Liquidity is rebuilt by reducing short-term borrowings and acquiring liquid assets during an economic slowdown or the early stages of an expansion.

Corporations have traditionally held significant amounts of their liquid assets in the form of demand deposits at commercial banks. Such balances have not earned interest since 1933, but this was not of great signficance during the low interest rate periods of the depression and just after World War II Interest rates began to climb in the late 1950's, and the higher rates have had a significant impact on how corporations handle their liquidity positions They constituted an inducement to develop "cash management" techniques in some ways parallel to the "liability management" techniques adopted by banks during the same period Cash management consists of a variety of procedures designed to achieve four goals to speed up the receipt of payments due; to slow down the disbursement of payments owed; to keep a corporation's demand deposits to a minimum because they earn no interest; and to earn the maximum return on liquid asset holdings

Repurchase agreements are particularly useful as tools of cash management. They generate income for the supplier of funds and are generally regarded as secure. Their key advantage is flexibility, primarily because they can be arranged for periods as short as one day. Few if any other income-generating assets have

[4] The dealer does not own the securities that he promises to deliver in a short sale He "covers" the short by buying in the open market the particular security he has promised to deliver Trading profits can be earned during periods of falling securities prices if the securities that were sold short become available at below-contract prices prior to the agreed-upon delivery date

this feature. Regulations prevent banks from issuing CDs with maturities of less than thirty days; commercial paper and bankers' acceptances can be obtained for shorter periods, but as a practical matter not for one day. None of these instruments are viewed as being quite as secure as repurchase agreements, where there is a margin between the amount of funds supplied and the value of the securities. Corporations can buy Government securities or other financial assets and hold them for short periods, but the transaction costs can be relatively high and the possibility of capital loss reduces the attractiveness of such alternatives. The overnight feature of RPs means that corporations treat them as if they are income-earning demand deposits.

Corporations make heavy use of a particular form of RP known as the "continuing contract". Under such a contract, a corporation will agree to provide a specific volume of funds to a bank or a dealer for a certain period of time However, during the life of the contract the repurchase agreement is treated almost as if it were reestablished each day. That is, earnings are calculated daily, often related to the prevailing overnight RP rate. Either party has the right to withdraw at any time, although this right is seldom used The principal advantage of the continuing contract over the daily renewals of an RP is that securities and funds are exchanged only at the beginning and at the end of the contract. The continuing contract therefore significantly reduces transactions costs, compared with daily RPs. An additional feature of the continuing contract RP is the seller's right of substitution, under which securities of equal value may be used to replace those originally involved in the RP. This option does not appear in all continuing contracts but, where it does appear, it is frequently exercised.

Another RP arrangement rather similar to the continuing contract specifies neither a definite period nor a fixed amount. Arrangements are made by banks chiefly for their corporate customers. The corporation concentrates all its demand balances in a single account at that bank daily. Before the bank closes its books each day, the corporation's balance in this account is determined, and any excess over a specified minimum is automatically converted into an RP The following morning the funds are moved from the RP back to the corporation's demand balance for use during the day. Such automatic arrangements for the conversion of demand deposits to RPs are often included in packages of services offered by banks to their corporate customers. Among the services in such packages are lines of credit, payroll admininstration, and the use of safekeeping facilities Payment for such service packages is usually not made on the basis of a stated fee. Instead, average or minimum demand deposit balances—called compensating balances—are usually required.

RPs also can be used to provide liquidity for somewhat longer periods, for example, to allow the accumulation of funds for a tax or dividend payment This option is particularly attractive to corporations if the income that can be earned on a longer RP exceeds that available on an overnight RP One or several RPs can be written, as liquidity is accumulated over the period prior to a payment date, with the contracts maturing on the day disbursements must be made The RP has less commanding advantages over other money market assets for longer periods, however. Commercial paper can frequently be tailored to mature on a specific day, and Treasury bills that mature very close to the desired date can often be purchased. RPs are nevertheless used very frequently for such purposes, primarily because they can be arranged easily and quickly once a corporation has established a routine trading relationship with market participants.

The volume of corporate RPs has grown dramatically in the 1970's This growth has not been smooth, but has occurred in bursts Monetary policy was quite restrictive through 1969 and into 1970, and again in 1973 and early 1974. During these periods, interest rates, particularly on short-term instruments, reached very high levels. The interest income foregone by holding demand deposits was obviously very high, and corporate treasurers responded by accelerating the development of cash management techniques in general and increasing the use of RPs. In effect, the periods of high interest rates helped corporations meet the cost of developing these new techniques, and the high rates then attainable explain the apparent paradox that corporations provided a growing volume of funds to the RP market when they were most strapped for cash.

Interest rates fell rather quicky once the economy entered the 1974-75 recession. For a time, as they had in the earlier periods of declining interest rates, corporations reduced their supply of funds to the RP market. By early 1975, however, corporations began to expand their RP activity rapidly. The apparently atypical increase in RP activity was brought on by the combination of several forces. Most important, the RP became widely accepted as an instrument of cash management for corporations. During preceding periods, many corporations did not participate in the RP market due either to restrictions in their by-laws or to lack of familiarity with the instrument among corporate treasurers. But by the mid-1970's, by-laws of many corporations had been changed, and the instrument had become widely accepted. Coincidentally, by

1974 many corporations felt that their liquidity had reached dangerously low levels, and rebuilding liquidity thus became a high priority. Reductions in capital expenditures and inventories were possible as the economy turned downward, thereby reducing corporate borrowing needs and contributing to improved cash flow Corporations were able to begin to accumulate liquid assets as soon as cash flow began to improve after the worst of the recession was over, a process that has continued since Significant portions of the new-found corporate liquidity were placed either in outright purchases of Government securities or in repurchase agreements against such securities.

State and local government units have entered the RP market only in recent years but have quickly become major suppliers of funds The RP is particularly well suited to their needs These governments usually are required by law to hold their assets in the most secure form, generally in bank deposits or Government and Federal agency securities The RP provides a way of meeting these requirements while earning income on short-term investments.

Tax receipts of state and local governments never match exactly the timing pattern of their expenditures, thereby creating the need for them either to borrow or to invest for short periods at various times of the year Until recently their major investment alternative to deposits has been Treasury bills As the advantages of the RP have become more widely recognized, these governments have switched more of their liquid investments into RPs

In 1972, the Congress passed revenue-sharing legislation which increased the total volume of Federal money flowing to states and localities. The revenue-sharing payments are concentrated at the beginning of each calender quarter, and state and local governments have invested large portions of these funds in RPs until needed.

The role of nonbank financial institutions

Several types of nonbank financial institutions are active in the markets for immediately available funds. These include mutual savings banks, savings and loan associations, branches and agencies of foreign banks that operate on United States soil, and Edge Act corporations (The latter are affiliates of United States commercial banks empowered to engage in international or foreign banking in the United States or abroad.) All of these institutions are active primarily in the market for Federal funds, and generally do not enter into repurchase agreements in volume. They generally lend Federal funds to commercial banks, although under certain circumstances agencies and branches of foreign banks will borrow from banks or other nonbank lenders

The appearance of all these institutions in the Federal funds market has occurred relatively recently. Their entry has dramatically changed the function of the Federal funds market, allowing the banking system to draw funds from a wide array of institutions, instead of just reallocating reserves. The expanded borrowing ability of banks serves to integrate more closely the United States financial structure, and to help break down the barriers which have traditionally existed among various types of financial institutions

The agencies and branches of foreign banks have also become active participants in the Federal funds market. These institutions deal with or represent foreign commercial banks, which trade in both the money markets of their home countries and in the Eurocurrency markets. Through the Federal funds market, the agencies and branches of foreign banks provide a link between the various markets abroad and the United States commercial banking system

The participation of these institutions in United States financial markets mirrors the activities of United States commercial banks overseas In the last three decades, overseas branch networks of United States banks have grown significantly in both the scale and range of their operations, and these networks have provided United States banks with easy access to foreign and international financial markets Entry into the Federal funds market by agencies and branches of foreign banks, therefore, has contributed to the continuing integration of credit markets and banking in the United States and abroad.

The role of the Federal Reserve

The Federal Reserve is important to the markets for Federal funds and RPs for two quite different reasons One is that Federal Reserve regulations play a very important role in the markets by limiting the type and terms of transactions member banks may undertake A second is that actions taken by the Federal Reserve in the normal conduct of monetary policy have a major influence on the levels of interest rates in general and on the Federal funds rate in particular Federal Reserve monetary policy is oriented toward achieving steady and sustained growth of the economy, along with reasonably stable prices. Such a sound economy depends on a multiplicity of factors, one of which is the capacity of the commercial banking system to extend loans and create deposits. These capacities, in turn, are strongly influenced by the interest rate on Federal funds and the supply of reserves to member banks.

The Federal Reserve controls the supply of reserves through open market operations, mainly via outright purchases and sales of Government and Federal agency securities. An outright purchase of securities provides reserves permanently, while a sale permanently reduces the total supply of reserves But the Federal Reserve also needs to provide and absorb reserves for short periods, mainly to accommodate the seasonal needs of banks for reserves and to offset the effects on reserves of day-to-day changes in currency in circulation, in the Treasury's balance at Federal Reserve Banks, and in Federal Reserve float Reserves can be supplied temporarily by use of repurchase agreements, and absorbed temporarily through "matched sale-purchase transactions", which most market participants call reverse RPs

A full historical treatment of Federal Reserve use of the RP and matched sale-purchase transaction would require another article, but a few highlights are important because they have influenced the development of the RP market. Federal Reserve use of the RP dates back to 1917, but extensive use of the instrument began only in the postwar period. Matched sale-purchase transactions were first used to absorb reserves in 1966 The technique was introduced at the time of a sudden, temporary increase in float arising from a widespread interruption of airline service. The amount of reserves needed to be absorbed at that time was too large to be handled by *outright* sales of securities by the Federal Reserve without disturbing the financial markets

Until 1972, Federal Reserve RPs were executed at a rate fixed by the Federal Reserve, usually the discount rate In that year the Federal Reserve instituted a competitive bidding procedure whereby the rate on RPs was set as a result of Government securities dealer offerings of securities in relation to Federal Reserve needs to provide reserves Shortly thereafter, dealers were permitted to offer to the Federal Reserve any securities they obtained in separate transactions with other market participants Until 1975, RPs were done by the Federal Reserve only with nonbank Government securities dealers. At that time, the practice was changed to include commercial bank Government securities dealer departments. All these changes contributed to the acceptability, flexibility, and utility of the RP.

Federal Reserve use of RPs and matched sale-purchase transactions for temporary reserve adjustment has grown sharply in the past few years, but for generally different reasons than those which explain the increase in the use of RPs by banks and others. The increase has arisen in large part from a change in Treasury procedures for handling its cash balances Prior to August 1974, the Treasury received payments into accounts at commercial banks, and generally moved funds into its balance at the Federal Reserve only as funds were needed to make payments on behalf of the Federal Government. Under this scheme, Treasury balances in commercial banks fluctuated widely, but the Treasury balance at the Federal Reserve was reasonably stable. In August 1974, the Treasury began to move its balances more quickly into its accounts at the Federal Reserve Banks, which climbed by several billion dollars over a period of several months. This policy has led to much wider fluctuation in these accounts This in turn has created greater variability in the supply of reserves available to the banking system which the Federal Reserve usually offsets by temporary adjustments to reserves through RPs or matched sale-purchase transactions

Some major implications

The Federal funds and RP markets have grown dramatically since World War II, but particularly in the past few years. This growth is due in part to changes in the regulations which govern the operations of commercial banks, but is more basically due to the changing practices and behavior of all participants in these markets The circumstances influencing each group of market participants have differed in detail, but for all, the quite high interest rates since the mid-1960's have provided the major motivation

In addition, technological development has made participation less costly Growth—both in trading volume and in the number of institutions participating in the markets—has not been even. Periods of most rapid growth in these markets have occurred when interest rates were rising toward or stood at postwar peaks. For the most part the markets for immediately available funds have contracted as interest rates fell from successive peaks, but never by as much as in the earlier periods of expansion.

The growth in the Federal funds and RP markets has several implications Most importantly, the markets have expanded to include a broader range of domestic and international financial institutions and corporations. They use the markets as a link in a worldwide network that transfers interest-sensitive dollar balances to wherever they are in greatest demand To be sure, mechanisms to move funds to high-demand uses have existed for some time, but the Federal funds and RP markets help make the task easier and more efficient by bringing interest-sensitive funds into a central marketplace from a broader arena. For example, most individuals who hold deposits at thrift institutions do not move their funds quickly from one investment to another in response to small interest rate changes. But thrift institutions can lend in the Federal funds market, in effect allowing the small deposits of individuals to be combined and placed directly in the national markets for short-term credit Similar considerations apply with respect to international credit flows.

These developments have some implications for the conduct of Federal Reserve monetary policy. Policy actions significantly influence the Federal funds and RP markets, which commercial banks now use as sources of funds more extensively than ever before. Hence any change in the availability of funds in these markets probably has a more direct impact than before on the cost to banks of making loans and on the rates they charge. Moreover, many more small banks and nonbank financial institutions have become quite active in the markets. Through this mechanism, Federal Reserve monetary policy is felt more quickly and directly by a broader range of the financial institutions, including those that provide a major portion of the total credit available in the United States economy.

United States and international financial markets have also become more closely integrated in recent years There are multiple linkages among the various markets, but they center on the activities in this country and abroad of multinational corporations and of United States and foreign commercial banks. These institutions borrow and lend sizable amounts in both the United States and international markets, and are sensitive to the margins between borrowing and lending rates in different countries. For example, if short-term interest rates in the United States were higher than abroad, the differential would quickly draw funds from other uses abroad and channel liquidity into the United States financial markets These flows would tend to reduce the differential between interest rates abroad and in this country

But the flows of credit induced by such interest rate differentials may not be in keeping with Federal Reserve policy objectives at the time. For example, a restrictive monetary policy works to reduce spending by individuals and businesses, partly because it makes borrowing more expensive and difficult to obtain. The effects of such policies on the domestic economy could be dampened if large corporations and financial institutions can readily obtain credit elsewhere.

While high interest rates and inflation have encouraged growth of the Federal funds and RP markets, the evolution of technology, particularly the use of computer facilities, has also played an important part. The new and changing technology speeds the transfer of funds, reduces the cost of record keeping, and increases the availability of information concerning investment opportunities. It seems certain that technological change will continue at a rapid rate, thereby reducing further the costs of arranging and executing financial transactions and reinforcing the already strong trend toward aggressive financial management.

The rapid growth of the markets for Federal funds and RPs in recent years can be viewed as part of a pervasive trend in all United States financial markets toward more aggressive portfolio management by holders of financial assets This trend will clearly continue to be a strong influence on the markets. Participants will no doubt devise new trading techniques, refine existing ones, and attract others into the marketplace. But the Federal funds and RP markets are only two of many markets for short-term financial claims, and their growth relative to others will be heavily influenced by the regulatory and legal framework in which they operate. These markets could be significantly affected by several proposals for financial reform that have been put forth in recent years, some in the form of legislative proposals introduced in the Congress.

Of particular note in this respect are the increasing number of arguments heard in favor of relaxing or eliminating prohibitions against the payment of interest on demand deposits and the payment of interest on member bank reserve accounts. Such proposals, if enacted, would probably have minor effects on the Federal funds market insofar as it is used by banks for reserve adjustment purposes, but would more heavily affect the use of both the Federal funds and RP markets as sources of funds on a continuing basis by banks. The effect any legislation will have on the markets will, of course, depend on the exact provisions. But one fact seems clear: legislative and regulatory changes can channel the pressure emanating from aggressive financial management into or away from the Federal funds and RP markets, but it is unlikely that financial management itself can be forced to return to the tamer posture of a decade and more ago

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