Monetary Policy and Open Market Operations during 1989

Overview

Monetary policy in 1989 sought to sustain the ongoing expansion of the economy at a moderate pace while at the same time fostering price stability. Concerned by signs of escalating inflation, the Federal Open Market Committee (FOMC) pursued a gradual firming of reserve pressures in the early months of 1989, as it had during most of 1988. By late spring, however, indications of a slowdown in the economic expansion led the Committee to move gradually to a more accommodative posture.

Following its December 1988 meeting, the Committee directed the Desk to institute a two-stage firming of reserve pressures in light of evidence indicating that the economy was expanding at a vigorous pace and that inflation might intensify. The initial move was implemented on December 15, and the second step was taken in early January. As incoming data signaled mounting inflationary pressures, another tightening move was made in February. Moreover, the Board of Governors approved a ½ percentage point increase in the discount rate, to 7 percent, on February 24.

By May, however, the FOMC saw the risks to the economy of higher inflation and a substantial shortfall in economic growth as being more evenly weighted. Then, in early June, with new evidence pointing to a slowdown in economic activity and with some indicators suggesting that a gradual reduction of inflation was likely, the FOMC began moving toward a more accommodative reserve posture. In July, additional data reinforced perceptions that economic activity was moderating, and reserve pressures were reduced twice in that month. Amid further signs of weakening in the expansion during the final months of the year, reserve pressures were eased again in October, November, and December.

Although the longest recorded economic expansion in U.S. peacetime history continued in 1989, the pace of that expansion slowed considerably. Real GNP advanced 2.6 percent (fourth quarter over fourth quarter), or 2.0 percent after adjusting for the impact of the 1988 drought. Consumer spending, investment in producers' durable equipment, and net exports accounted for most of the expansion in real GNP, although growth of all three components was more subdued than in the previous year. The reduced pace of economic activity was reflected in smaller job gains in 1989. Nonetheless, the civilian unemployment rate in the fourth quarter was unchanged from its year-earlier level. Meanwhile, most broad inflation measures advanced at roughly the same pace as in 1988, although pressures abated somewhat in the second half of the year.

Yields on investment-grade fixed-income securities fell on balance in 1989. They rose over the first three months of the year amid indications of economic strength and rising inflation. Yields fell considerably from late March to early August as the market sensed

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a softening economy and the Federal Reserve shift to accommodation. Over the balance of the year, yields backed and filled but showed no trend. Yields backed up in August and September in response to stronger than anticipated economic activity and uncertainties about how much further the Fed would ease Later, yields fell a bit as new data suggested weaker economic expansion and market participants came to expect that the Federal Reserve would continue easing its policy.

In contrast, yields on below-investment-grade bonds, known as "high-yield" or "junk" bonds, rose sharply. This sector was buffeted by large defaults and bankruptcy threats, especially during the latter part of the year. These events focused attention on the risks associated with highly leveraged companies, causing spreads to widen between the companies' debt and investment-quality instruments. Trading and issuance thinned, and investors became increasingly sensitive to the characteristics of specific issues.

Credit worries also remained a problem in the thrift industry, where large losses and insolvencies at a number of institutions continued tc place strains on the financial system. The need to finance the restructuring and rescue operations was addressed by legislation passed in August. The Financial Institutions Reform, Recovery and Enforcement Act of 1989 provided for $18.8 billion of "on-budget" federal financing in fiscal 1989 In addition, the act established a new agency, the Resolution Funding Corporation, with the authority to borrow $30 billion before October 1991. The agency auctioned its first offering of bonds late in the year.

Money and debt growth decelerated in 1989. M2 advanced at a 4.6 percent rate (fourth quarter over fourth quarter) and finished the year well within its target range, while M3 expanded at a 3.2 percent rate and ended just below the lower bound of its growth cone [1] For the year as a whole, M1 grew a meager 0.6 percent Total nonfinancial debt expanded at an 8.0 percent rate, which placed debt below the midpoint of its monitoring range. M2 and M3 grew slowly over the first half of the year, while M1 fell.[2] In contrast, M1 and M2 growth accelerated sharply over the second half of the year as the opportunity cost of holding money fell. M3 growth initially picked up a bit, along with growth in the narrower measures, but then weakened when managed liabilities at thrifts contracted as part of the restructuring of the thrift industry.

The Trading Desk's reserve management procedures, which depend upon a reasonably predictable relationship between borrowing and the spread between the federal funds rate and the discount rate, were again complicated by shifts — mostly downward — in the willingness of depository institutions to borrow from the discount window under the adjustment credit program. As a result, the relationship between the amount of borrowing undertaken for both adjustment and seasonal purposes and the degree of money market firmness was somewhat uncertain. The Desk therefore pursued the borrowing objective flexibly in order to achieve the degree of restraint desired by the FOMC. With adjustment credit running light in 1989, the behavior of seasonal borrowing dominated the movements in the series "adjustment plus seasonal borrowing." Seasonal borrowing tends to be high in the summer and low in the winter; a number of technical adjustments were made to the borrowing allowance during the year in order to accommodate this tendency and leave reserve pressures unaffected.

Record purchases of foreign currency by U.S. monetary authorities altered the nature and timing of the Desk's open market operations in 1989. As a consequence, the growth of the System's holdings of foreign currency provided more than enough reserves to cover the drain on reserves from the rise in currency — a rise that was in itself below average. Furthermore, in the face of weakness in reservable deposits that held down required reserves, nonborrowed reserves were permitted to grow only modestly. The Desk reduced the size of the System portfolio (on a year-over-year basis) for the first time since 1957. This reduction was accomplished through redemptions of maturing Treasury securities and through sales of Treasury issues in the market and to foreign customer accounts

The economy and domestic financial markets

The economy

The economy expanded less vigorously in its seventh consecutive year of growth. Real GNP grew 2.6 percent in 1989, down from 3.4 percent in the preceding year.[3] The U.S. Department of Commerce estimates

[1] All money and debt growth rates cited in this report are based on the data available on March 15, 1990 The money data incorporate the February 1990 benchmark and seasonal revisions, subsequent revisions, and the redefinition of M2 Under the new definition, M2 incorporates thrift overnight repurchase agreements Over the four quarters of 1989, these revisions increased the growth rates of M1 and M2 by 0 1 percentage point and lowered the growth rate of M3 by 0 1 percentage point

[2] February and March 1990 revisions elevated money growth in the first half of the year (H1) and lowered growth in the second (H2) The growth of M2 was raised by 0 5 percentage point in H1 and lowered by 0 3 percentage point in H2 M3 growth was increased by 0 5 percentage point in H1 and decreased by 0 5 percentage point

Footnote 2 continued
in H2 M1 fell 0 7 percentage point less than originally reported in H1, and its growth was 0 6 percentage point lower in H2

[3] All references to annual growth rates in this section are on a fourth

that real GNP growth, excluding the effects of the 1988 drought, was 2.0 percent in 1989, about half of the 1988 drought-adjusted rate of expansion. Slower growth in consumer spending and exports as well as a sharp drop in residential construction more than accounted for the deceleration in economic activity. The pace of nonfarm business inventory accumulation fell for a second consecutive year in 1989, but not as much as in 1988. Real final sales increased 2.5 percent, compared with 4.4 percent in 1988.[4] Employment gains in 1989 were also below the previous year's pace; nonfarm payroll employment was up 2.4 percent, compared with 3.2 percent in 1988. The civilian unemployment rate was mostly steady during the year and stood at 5.3 percent in the final quarter of 1989, unchanged from its year-earlier level

Over the year as a whole, growth was primarily sustained by consumer and investment expenditures. Consumer spending grew 2.5 percent over the four quarters of 1989, an increase considerably below the nearly 4 percent advance of 1988. Most of this slippage reflected some retrenchment in purchases of motor vehicles.[5] Supporting the growth in consumer spending over the year was a 3.6 percent pickup in real disposable income, which was only moderately below its 1988 rate of increase. Heavy purchases of computer-related equipment encouraged the healthy growth of business investment in producers' durable equipment. In contrast, housing construction slid under the weight of weak real estate markets, and nonresidential construction remained sluggish in the face of high vacancy rates.

Economic activity showed signs of losing strength as the year progressed. Real fixed investment in the second half of the year was nearly unchanged from its average level in the first half. Following strong gains in the first quarter, real net exports only improved a bit, on balance, over the remainder of the year as slower export growth was accompanied by an upswing in imports. In the final quarter, total GNP growth fell to a 1.1 percent annual rate, although the slowdown was partly a result of the California earthquake and the strike at the Boeing Company. Meanwhile, employment growth declined in each quarter from a peak rate of over 3 percent in the first quarter to under 2 percent in the fourth quarter of 1989.

The slowing pace of economic activity was most evident in the manufacturing sector. Manufacturing employment edged a bit lower in 1989, after having risen almost 2 percent in 1988 Sizable manufacturing job losses occurred in each of the last four months of 1989. These losses stemmed in part from the slackening pace of industrial production over the second half of the year. Meantime, the capacity utilization rate also declined modestly over the final two quarters. It began the year at its 1989 high of 84.3 percent — the peak level for the current expansion — and closed the year at 83.0 percent.

By most broad measures, prices in 1989 continued to rise at roughly the pace set in 1988. Led by surging food and energy costs, price pressures appeared to be mounting in the first half of the year, but inflation subsided later when energy costs declined. The consumer price index rose 4.6 percent in 1989 (December over December), or 4.4 percent when the index's volatile food and energy components are excluded. These rates of increase are roughly the same as those recorded in 1988. The fixed-weighted price index advanced 4.1 percent, down from 4.5 percent in 1988. Price pressures were somewhat stronger at the early stages of production. the producer price index (PPI), largely reflecting higher food and energy costs, increased 4.8 percent, up sharply from 4.0 percent in 1988. (Excluding these costs, the PPI advanced at about its 1988 pace.) Wage pressures showed no signs of abating The employment cost index in December 1989 was 4 8 percent above its year-earlier level, a rate of increase virtually identical to that in 1988, indicating little change in underlying wage pressures. Indeed, unit labor costs rose 5 percent in 1989, compared with 3 percent in the previous year, reflecting higher compensation costs and a decline in productivity growth.

Solid gains were made in reducing the merchandise trade deficit early in 1989, but progress stalled around midyear. Measured in current dollars, the average annual trade deficit for the year narrowed by $16 billion to $111 billion, the real trade deficit diminished by a similar amount and averaged $108 billion. By both measures, the reduction in the trade deficit was about half the improvement achieved in 1988 A strong export performance was again registered in the first half of 1989, extending the pattern set in the preceding two years, but export growth decelerated markedly in the final two quarters of the year. Meanwhile, import growth continued at its 1988 rate. The slowing pace of improvement in the trade balance largely reflected the waning impact of the dollar's steep 1985-87 decline. In

Footnote 3 continued
quarter over fourth quarter basis unless specified otherwise Quarterly rates are seasonally annualized changes from the preceding quarter

[4]These increases are not drought-adjusted The slowdown in final sales growth would be even more pronounced if the impact of the drought were excluded

[5]In addition, growth in 1988 had been boosted by a low level of consumer outlays at the end of 1987 Late 1987 consumption was dampened by the expiration of auto sales incentives and by some consumer caution in the aftermath of the October 1987 stock market break

1989, the trade-weighted value of the dollar rose sharply in the first half of the year but then skidded to finish the year close to its year-end 1988 level.[6]

Fiscal restraint at the federal level left total government purchases of goods and services, measured in real terms, virtually unchanged in 1989. Purchases by the federal government fell for a second consecutive year, while growth in state and local government purchases eased slightly. At the federal level, both defense and nondefense spending declined (either including or excluding purchases by the Commodity Credit Corporation). The federal budget deficit in fiscal year 1989 was $152 billion on a unified basis, close to its level in each of the preceding two fiscal years. Continued economic expansion lifted revenues during the fiscal year, but sizable increases in net interest payments and spending to liquidate insolvent thrifts boosted growth in total outlays, despite restraint exercised in other spending categories.[7]

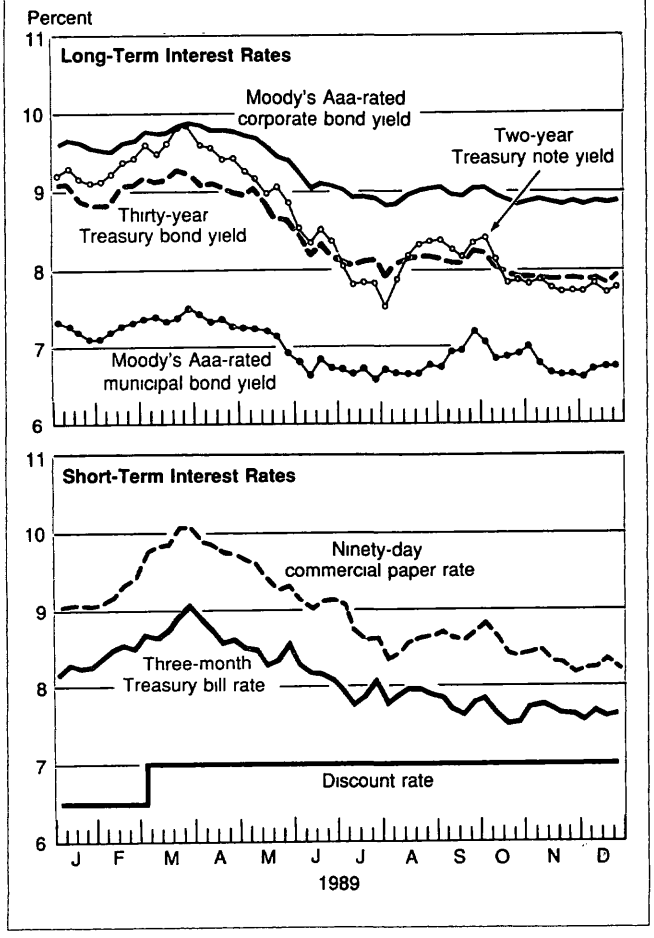
Domestic financial markets

Yields on investment-grade fixed-income securities fell in 1989 (Chart 1). In sharp contrast, yields on many below-investment-grade corporate securities finished the year markedly higher because major defaults and bankruptcies in the latter half of the year upset investor confidence in this sector. In areas not plagued by credit quality worries, shorter dated issues led the move to higher yields over the first three months of the year. After peaking in late March, yields fell considerably through early August. Over the rest of the year, yields moved in a narrow range and finished modestly above their midsummer lows.

The principal influences on financial markets in 1989 were the prospects for real economic growth and inflation and the outlook for Federal Reserve policy. A number of economic releases, believed to offer insight into the underlying strength of economic activity and price pressures, were routinely monitored. They helped to shape investors' expectations about economic growth, inflation, and the direction of System policy. Market participants paid particular attention to the monthly nonfarm payroll employment data, a timely and relatively comprehensive measure of economic performance. The monthly national purchasing managers' report was also closely scrutinized for early signs of developments in the manufacturing sector. Several price series were watched to keep abreast of the latest inflation trends; foremost among these was the PPI. The behavior of the dollar on foreign exchange markets also influenced yields at times. This effect was achieved partly through the dollar's impact on expected future inflation rates. a strong dollar placed downward pressure on import prices and thereby lessened fears of higher inflation. In addition, a strengthening dollar was seen as encouraging investment inflows from abroad, inflows which would tend to boost the value of dollar-denominated instruments. Throughout the year, yields often moved whenever market participants thought that an imminent change in System policy was likely. At these times, participants closely followed

Chart 1

Long-Term and Short-Term Interest Rates



[6]The dollar fell 4 6 percent against the West German mark over the year, while it rose 15 3 percent against the Japanese yen

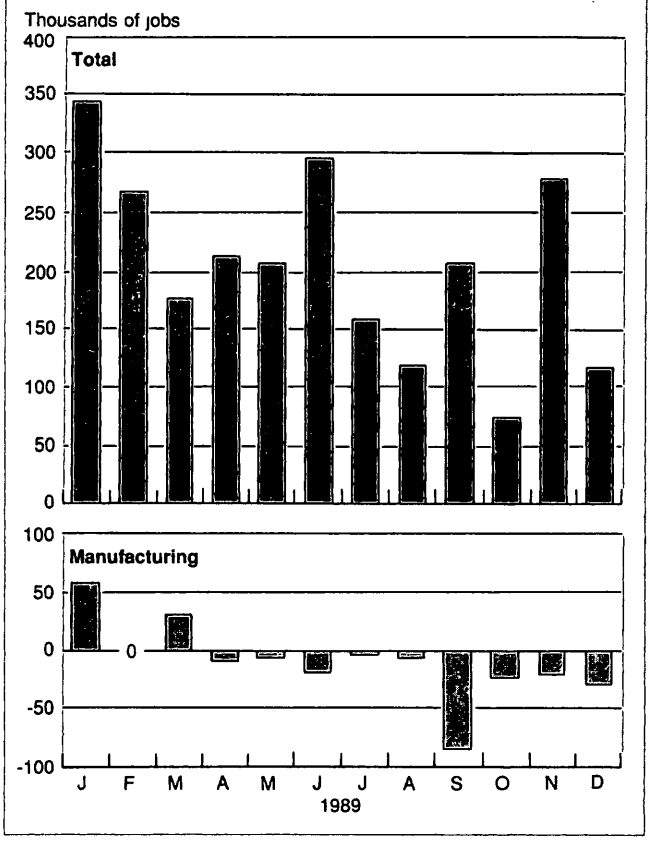
[7]In fiscal year 1989, net budget outlays aimed at resolving the thrift crisis more than doubled, rising from $8 billion in 1988 to $18 billion In 1989, roughly half of the net outlays were made by the now-defunct Federal Savings and Loan Insurance Corporation (FSLIC), while the remainder were made by the Resolution Trust Corporation — created by legislation passed in August Previously, almost all such outlays had been undertaken by the FSLIC Expenditures for this purpose are widely seen as having a minimal impact on economic activity

movements in the federal funds rate to gauge the stance of policy.

Yields on investment-grade securities rose over the first three months of the year, in part reflecting System moves to increase reserve pressures. Short-term yields moved up early in January following the System's move to firm reserve pressures, but long-term yields declined modestly as inflation fears eased. Along with the firming action, a strong dollar in foreign exchange markets and Chairman Greenspan's mid-January congressional testimony reiterating the System's commitment to controlling inflation dampened inflation expectations. The market's inflation psychology shifted sharply in early February, however, and remained pessimistic through March because economic statistics pointed to a pattern of robust economic growth coupled with accelerating inflation. Payroll employment data for January and February showed strong job gains (Chart 2), while the producer price indexes for these months recorded sharp advances. Rising oil prices also aggravated the negative inflation prospects. Yields on shorter term issues rose more than those on longer term issues in response to prospective and actual policy actions aimed at combating these price trends, including the discount rate hike in February.[8]

Chart 2

Changes in Nonfarm Payroll Employment



Evidence that the economy was losing some momentum while inflation was stabilizing led to a period of declining interest rates that lasted from early April until midsummer. Reports that the purchasing managers' index had tumbled and nonfarm payrolls had shown only a small gain for March supported some earlier signs of a slowdown, such as a decline in February retail sales. Meanwhile, producer prices for March advanced more modestly than in the previous two months. Together, these developments helped to dispel expectations that monetary policy would be firmed again, and yields edged off the levels reached late in March. As May progressed and incoming data suggested a further slowing in economic activity, the market began to anticipate an easing in the policy stance. A dollar that showed strength against major foreign currencies also exerted downward pressure on yields. Yields tumbled in mid-May after the release of the April PPI, which showed a slight decline when the volatile food and energy components were excluded. These developments were reinforced in early June by the report of weak job gains in May. Moreover, the purchasing managers' index dropped to 49 7 percent, the first reading below 50 percent in thirty-three months. (A reading below 50 percent implies that activity in the manufacturing sector is contracting.) Chairman Greenspan's concerns about weakness in the economy, expressed during his July 20 Humphrey-Hawkins testimony, briefly added support to the markets. Also in July, the yield on the two-year note fell below that on the thirty-year bond, and the yield curve took on a positive slope for maturities between two and thirty years.

In August and September, economic activity showed some signs of vigor, but growth was not expected to exacerbate inflationary pressures In this environment, policy was expected to remain steady, and yields moved slightly higher because several easing moves had already been incorporated into the yield structure. News of sizable job gains in July, along with a substantial upward revision to June's employment rise, pressured yields higher in early August. Uncertainties about financing provisions of the thrift legislation and about the Treasury's debt ceiling added briefly to the pressures, particularly in the Treasury sector. (In early August, the Treasury obtained a temporary increase in the ceiling that lasted until October 31.) There followed

[8]One outgrowth of the higher yields on shorter dated Treasury issues in the early months of the year was a surge in noncompetitive tenders, a measure of individual investor interest, at auctions of Treasury bills and short-dated notes

a series of mixed economic reports that, on balance, supported the perception of a moderate pace of economic activity. The producer and consumer price indexes reported during this time generally suggested lower inflation than earlier in the year.

Yields moved lower on balance over the final three months of the year, based in part on expectations that the signs of sluggish economic activity would lead to additional moves to ease policy. Market participants increasingly focused on the performance of the manufacturing sector, which appeared to be contracting at the same time that other sectors of the economy were showing signs of continued growth. Each of the final three employment reports released during 1989 showed a marked fall in manufacturing employment.

Further evidence of a manufacturing slowdown was found in the purchasing managers' index and the industrial production index. Meantime, prices seemed to be rising at a slower pace than in the early months of the year Yield declines, especially on short-term issues, were fostered by prospective and actual System moves to ease policy. Indeed, the System reduced reserve pressures on three more occasions before year-end. (However, yields responded only briefly to the December easing move because the easing had been anticipated and was already almost fully reflected in yields.)

U.S. Treasury securities

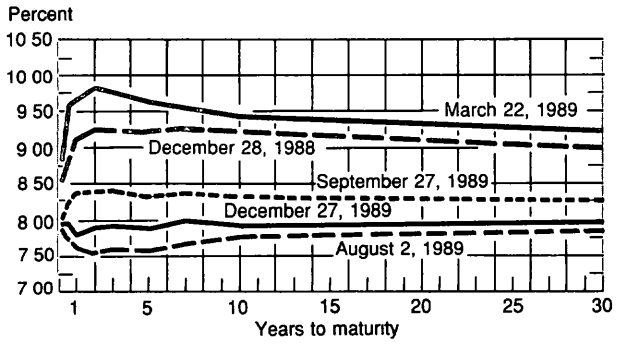
The Treasury yield curve was hump-shaped from the beginning of the year until early July and again from mid-August to mid-October (Chart 3). Yields on Treasury bills were generally below those on short-dated coupon issues, which in turn mostly exceeded the yields on the thirty-year bond. During the remainder of the year, the yield curve was relatively flat, although bill yields frequently exceeded those on short coupon issues. On balance, yields on Treasury coupon securities, as measured by the constant maturity series, declined between 110 and 140 basis points in 1989, with smaller reductions on the longer maturities. Treasury bill rates fell 60 to 120 basis points, with the largest decline recorded for fifty-two week bills

From time to time during the year, yields on Treasury issues were pushed lower when market disturbances elsewhere set off "flight-to-quality" demand The most dramatic example occurred in mid-October. Yields fell on October 13 in response to the late-afternoon, 190-point plunge in the Dow Jones industrial average. The sell-off in stocks was sparked by the failure of a bidding group to arrange financing for its proposed takeover of UAL Corporation. The stock market sell-off led investors to seek the safe haven of Treasury issues. The yield declines were partially retraced the next trading day as stock prices recovered, but yields remained below their prior levels, partly because of the soft federal funds rate.

Debt ceiling limitations complicated Treasury financing toward the end of October and briefly affected yields. Bill rates jumped when the Treasury announced an earlier than usual settlement date for its October 30 bill auctions. The Treasury adopted the earlier settlement in order to raise as much cash as possible under the enlarged temporary debt ceiling before the ceiling expired on October 31. The start of the Treasury's mid-quarter refunding auctions and a regular weekly bill auction were postponed until after a new $3.12 trillion debt ceiling was enacted on November 8. Potential upward pressures on coupon yields from the compressed financing schedule were offset by expectations of a falling rate pattern.

Chart 3

Yield Curves for Selected U.S. Treasury Securities



Note Treasury bill yields are on a bond-equivalent basis Coupon yields are constant maturity values.

Thrift legislation and its impact on Treasury and agency borrowing

The federal government's efforts to raise cash to manage the closing or merger of insolvent thrift institutions had a significant impact on borrowing by the Treasury and by U.S. government-sponsored agencies in 1989. The Financial Institutions Reform, Recovery and Enforcement Act of 1989 (FIRREA), originally proposed by President Bush in February and enacted on August 9, set forth the framework within which the thrift industry problems were to be resolved. The legislation was also aimed at overhauling the institutional structure and the rules for supervising and regulating the entire industry. One provision created the Resolution Trust Corporation (RTC), which was empowered to take possession and dispose of the assets of failed thrifts over the next sev-

eral years. It inherited this role from the Federal Savings and Loan Insurance Corporation (FSLIC), which discontinued its operations.

The RTC was authorized to spend a net total of $50 billion to resolve the problems of insolvent thrifts. The legislation stipulated that $18.8 billion of the outlays were to be financed out of general revenues, and Congress appropriated the funds in fiscal 1989. About half of the appropriated funds had been spent by the end of the 1989 fiscal year, and it was expected that the remaining portion would be used over the following two years. The RTC was to acquire the other $31.2 billion through the sale of capital certificates to the Resolution Funding Corporation (REFCORP), a new agency established by FIRREA.[9] To finance its purchase of RTC capital certificates, REFCORP was authorized to sell $30 billion of long-term bonds in fiscal years 1990 and 1991, while the Federal Home Loan Banks contributed another $1.2 billion in fiscal year 1989. Although REFCORP bonds are not obligations of, nor is their principal guaranteed by, the U.S. government, they have strong federal backing. Before each bond issue, REFCORP, using thrift industry funds, purchases directly from the Treasury zero-coupon securities with a principal amount and maturity date that match the REFCORP obligation, thus defeasing the principal. Furthermore, interest on REFCORP borrowing is to be paid out of Treasury and thrift industry funds, with the Treasury guaranteeing all interest payments.

The Treasury's borrowing operations during the year were affected by these efforts to meet the U.S government's liabilities to thrift depositors. The Treasury raised part of the $18.8 billion appropriated by the Congress by increasing Treasury bill issuance. In anticipation, bill rates moved higher as the passage of FIRREA neared. The Treasury expanded the sizes of the regular weekly bill auctions and of the fifty-two week bill auctioned on August 24 and raised an additional $5 billion through a 247-day cash management bill auctioned on August 10. Subsequently, the prospect of the sale of REFCORP bonds placed some upward pressure on yields of longer dated Treasury securities. Nonetheless, the added borrowing undertaken to fund RTC's expenditures appeared to have little lasting impact on interest rates in the Treasury market in 1989.

REFCORP entered the public debt market for the first time on October 25 and auctioned $4.52 billion of thirty-year bonds—the agency's only offering in 1989. Dealers approached the issue cautiously. Having no experience with such issues, they were uncertain how actively the bonds would trade in the secondary market. The auction went well, with the average yield about 28 basis points above the yield on the Treasury's thirty-year bond The spread remained near this level in subsequent trading during the balance of the year, although actual trading was generally light. Through the end of 1989, just over one-quarter of the issue was stripped to satisfy demand for zero-coupon instruments. As required by FIRREA, before the settlement of the issue, REFCORP purchased the zero-coupon Treasury bonds needed to ensure repayment of the principal, at a cost of about $400 million.

In related agency borrowing, the Financing Corporation (FICO) issued a total of $2.3 billion of thirty-year bonds during the year and used up much of its remaining borrowing authority. FICO was created in 1987 as a subsidiary of the Federal Home Loan Bank Board (FHLBB) and was authorized to borrow up to $10.8 billion to help recapitalize FSLIC, which at the time was under the supervision of the FHLBB.

Other U.S. government agency securities

The Tennessee Valley Authority (TVA) returned to the public debt market for the first time in fifteen years by selling $4 billion of bonds in October and again in November. The proceeds of these sales were used primarily to refinance (through defeasance) roughly $7 billion in high-coupon debt held by the Federal Financing Bank (FFB), the agency through which the TVA had previously arranged its financing TVA officials estimated that the refinancing could save TVA as much as $100 million per year in interest expenses. Typically, an agency that borrows directly in the public market cannot borrow from the FFB, however, TVA obtained an alternative credit facility for $2 billion from the FFB for the next two years. Strong investor demand for the offerings materialized and their sizes were increased from their originally planned levels. The November issue included $2.5 billion of forty-year bonds, callable after ten years. These bonds were unusual because of their long maturity.[10] They were initially priced to yield 110 basis points over the thirty-year Treasury bond, which is fully protected against an early call, and the spread had narrowed somewhat by year-end.

Corporate bonds

Public debt issued by U.S. corporations in the domestic bond market declined for the third consecutive year in 1989; such issuance fell by 12 percent to $177.4 billion.[11] Total issuance was heaviest in the spring and

[9]Receipt of these funds by the RTC is scored as a negative outlay in the federal budget accounts, thereby offsetting positive outlays of an equivalent amount

[10]Several telephone companies and foreign entities have offered callable forty-year debt in recent years

[11]Data on corporate and municipal debt issuance were supplied by the Board of Governors of the Federal Reserve System

fall, when borrowers sought to take advantage of ebbing interest rate levels. The dropoff in total new offerings stemmed from a sharp cutback in issuance of mortgage-backed securities and a decline in issuance of below-investment-grade securities.[12] These decreases were partially offset by a modest increase in investment-grade offerings and by another jump in asset-backed securities that was likely prompted by continued efforts to restrain asset growth to meet capital standards. Mortgage-backed issuance fell because of slow activity in the housing market and because the relatively flat Treasury yield curve limited profit potential from the issuance of collateralized mortgage obligations.

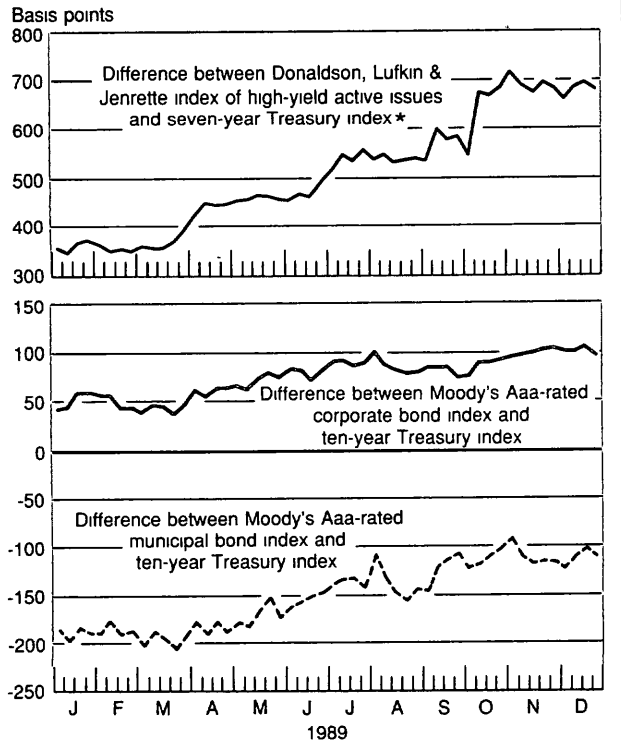
Yields on highly rated corporate bonds fell about 75 to 85 basis points, but Treasury yields dropped even more, so that spreads between yields on investment-grade corporate issues and yields on Treasury securities widened throughout the year (Chart 4). The wider spreads in part may have reflected investor concern about holding corporate bonds in a weakening economy. Spreads on debt of individual companies also depended on the companies' "event-risk" covenants. In 1988, the leveraged buyout of RJR Nabisco made clear that all but a few firms were subject to mergers, takeovers, or recapitalizations that could cause their outstanding bonds to lose their investment-grade status. Consequently, bondholders demanded higher yields to hold bonds that did not have protection against such occurrences. In 1989, more new issues carried event-risk protection. One such device, the "poison put," permits bondholders to resell their bonds to the issuer at a set price if specified events cause the bonds to lose their investment-grade status Bonds with event-risk protection generally had lower yields than similarly rated issues lacking such protection. To address event-risk concerns, Standard and Poor's introduced in July a rating system that evaluates event-risk covenants. The covenant rankings assess the degree of protection provided in bond indentures against a sudden and dramatic decline in credit quality resulting from a takeover bid, recapitalization, or similar restructuring. E-1 represents the highest level of protection, and E-5 indicates the lowest level.

Some bank holding company (BHC) debt was affected by problem loans to domestic real estate ventures late in the year. As real estate markets weakened, especially in the Northeast, some BHCs had to increase their loan-loss reserves to account for problems with their real estate portfolios, a move which resulted in depressed earnings. Yield spreads on BHC debt over Treasury issues widened, and the ratings of some BHC debt were lowered.

In other developments affecting the operations of BHCs, the Federal Reserve Board in January granted approval to five BHCs to underwrite corporate debt, contingent upon the Board's acceptance of the individual BHC's plan to capitalize its debt-underwriting operations The Board ruled that such underwriting must be conducted by a separate subsidiary that does not generate more than 5 percent of its total gross revenue from underwriting corporate debt and certain other securities. (This limit was raised to 10 percent in September.) In addition, with limited exceptions, federally insured banks and thrifts cannot provide loans to their affiliated underwriting subsidiaries. In July, J.P. Morgan Securities, a subsidiary of J.P. Morgan Bank Corporation, became the first subsidiary of a BHC to participate in a syndicated underwriting of corporate securities since the passage of the Glass-Steagall Act in 1933, and later became the first bank subsidiary since that time to act as the lead underwriter for a cor-

Chart 4

Yield Spreads



*High-yield index provided by Donaldson, Lufkin & Jenrette

[12]Below-investment-grade bonds are those rated lower than Baa by Moody's or, if not rated by Moody's, below BBB by Standard and Poor's

porate bond offering.

Yields on below-investment-grade or "junk" bonds rose sharply during 1989 as investor wariness about holding such securities intensified in the face of a slowdown in economic activity and the financial difficulties of several major issuers The spread between yields on junk bonds and those on Treasury securities began to widen in the spring and summer as market expectations of an economic slowdown took hold and raised doubts about the ability of many issuers of junk bonds to repay their debts. These doubts were underscored in mid-June when Integrated Resources, a real estate partnership syndicate, declared its inability to make a pending interest payment because of short-term funding problems.[13]

Yields on junk bonds were boosted even further over the second half of the year. In mid-September, Campeau Corporation, the Canadian-based owner of Allied Stores and Federated Department Stores, announced that it did not have funds to make interest payments on outstanding bonds of Allied Stores The value of bonds sold by both Campeau units tumbled, as did prices on outstanding issues of other retail establishments. Even though Campeau received a cash infusion from Olympia and York that enabled it to meet its immediate interest obligations, prices on Allied and Federated debt remained depressed as the company's funding problems persisted.[14] The episode increased sensitivity to the characteristics of specific issues in the junk bond market. Over the remainder of the year, a nervous undertone lingered in the market, sustained by rumored or actual adverse developments at many companies "High-quality" junk bonds held their value better than "low-quality" junk bonds. Trading was periodically volatile, and it ground to a virtual halt for a few days after the stock market declined precipitously on October 13. By year-end, the spread between the Donaldson, Lufkin and Jenrette index of yields on actively traded junk bonds and their index of yields on Treasury securities with seven years to maturity had almost doubled from its level at the start of the year (Chart 4).

Because of the growing problems experienced in this sector, total issuance of junk bonds during the year fell to $28.7 billion, about 8 percent below the previous year's level. The pace of new offerings dropped off considerably in the second half of the year in light of the unsettled market conditions. Included in the year's total issuance was an offering of $4 billion of RJR Holdings Capital Corporation securities in May — the largest corporate offering ever. The proceeds were used to repay short-term loans arranged as part of the $25 billion leveraged buyout of RJR Nabisco by Kohlberg Kravis Roberts and Company that was completed in February.

Several other developments during the year also affected the demand for junk bonds. The August thrift rescue legislation required savings and loans institutions to divest their holdings of low-rated bonds by 1994, although separately capitalized affiliates were still permitted to invest in such debt, over the remainder of the year, sizable thrift selling was noted at times. In November, as part of its budget legislation, Congress imposed limits on the deductibility of interest payments on certain securities that have a maturity greater than five years, that defer interest payments, and that have a yield to maturity more than 5 percentage points above the Applicable Federal Rate, as defined by the Internal Revenue Service. Both legislative changes had been widely anticipated and had little immediate impact on the market for low-rated securities, but they underscored growing congressional concern about the issuance of such debt, especially to finance corporate takeovers.

Municipal bonds

The municipal bond market remained relatively quiet in 1989. Total issuance for the year was $113.6 billion, close to the $114.5 billion issued in 1988. New-money issues posted a 5 5 percent increase, rising to $84 billion, while refunding issues declined 15 percent to $29.6 billion. The pace of new issuance was somewhat faster over the second half of the year, when municipalities took advantage of lower interest rates.

Yields on highly rated municipal bonds declined 55 to 65 basis points. Movements in municipal bond yields roughly followed those on Treasury securities, although the spread between yields on municipal bonds and those on Treasury securities narrowed somewhat over the year (Chart 4) The smaller spread over the second half of the year in part reflected the increased pace of new issuance at that time. Two other factors also contributed Sizable additions to loan-loss reserves during the second half of the year reduced many commercial banks' needs for tax-exempt income and decreased their demand for municipals In addition, some tax benefits of holding municipal issues expired at the end of the year, thus prompting some institutional selling.

A notable development in the municipal bond market during the year was the reentry of the Washington Public Power Supply System (WPPSS) in September, when it sold $721 million of refunding revenue bonds backed by projects 1, 2, and 3 The bonds were rated A by

[13]Integrated Resources adopted a restructuring plan later in 1989 but was forced into bankruptcy in February 1990

[14]Allied Stores and Federated Department Stores ultimately filed for protection under Chapter 11 of the bankruptcy code in January 1990

Moody's and AA– by Standard and Poor's. This offering marked the first time that WPPSS issued municipal bonds since it defaulted on $2.25 billion of projects 4 and 5 bonds in 1983—the largest default in the municipal market to date. After some delay because of legal complications, the offering went smoothly. Strong investor demand enabled WPPSS to increase the size of the new issue from its originally planned level of $450 million, although yields were about 25 basis points above those on similarly rated long revenue bonds. WPPSS sold an additional $738 million of bonds in December.

Monetary aggregates

Growth of all three monetary aggregates and total domestic nonfinancial debt decelerated in 1989 (Chart 5). After having slowed in the latter half of 1988, M2 and M3 growth rates were even more sluggish over the first half of 1989, while M1 actually contracted. Growth of M1 and M2 rebounded sharply over the final two quarters of the year. Despite this rebound in M2 growth and a modest pickup in bank credit expansion, M3 growth decelerated further because of factors associated with the restructuring of the thrift industry Debt expansion was a bit greater in the first half of the year than in the second Overall, M2 and M3 grew 4 6 and 3.2 percent, respectively, from the fourth quarter of 1988 to the fourth quarter of 1989 M1 eked out a gain of 0.6 percent, total nonfinancial debt expanded at an 8.0 percent rate. These rates of expansion placed fourth-quarter M2 slightly below the midpoint of the FOMC's growth cone and placed M3 just below its cone. The debt measure finished the year slightly below the midpoint of its monitoring range.

In February, the FOMC reaffirmed the 1989 growth ranges for M2 and M3 that it had tentatively established the preceding June. These ranges called for growth of 3 to 7 percent for M2 and 3½ to 7½ percent for M3, compared with a range of 4 to 8 percent for both M2 and M3 in 1988. The reduction of the growth ranges for 1989 was considered to be consistent with progress towards price level stability and underscored the Committee's commitment to an anti-inflationary policy. The width of these ranges was maintained at 4 percentage points in recognition of the degree to which the relationship between the monetary aggregates and economic performance has varied in recent years. M2 in particular has become very sensitive to fluctuations in interest rates. Consequently, the Committee agreed to evaluate money growth in light of other indicators, including inflationary pressures, the strength of the business expansion, and developments in domestic financial and foreign exchange markets.

The FOMC also reaffirmed the tentative monitoring range for total domestic nonfinancial debt that it had established in June 1988, and again decided not to specify a target range for M1 growth. It adopted a monitoring range for debt growth of 6½ to 10½ percent, compared with the range of 7 to 11 percent for 1988 In deciding not to set a target range for M1 growth, the Committee continued to view the relationship between M1 and economic activity as too unpredictable to warrant reliance on this measure as a guide for the conduct of monetary policy.

Most of the short-term variation in the demand for M2 around its trend can be explained by the movement of the spread between a market interest rate, such as the three-month Treasury bill rate, and the average rate paid on M2 deposits; this spread can be interpreted as the opportunity cost of holding M2 deposits.[15] The rate of growth of M2 is likely to decline, usually with a lag, as the opportunity cost of holding M2 assets rises. Short-term variations in M2's opportunity cost arise because the rates offered on most M2 deposits respond sluggishly to movements in market rates When holders of M2 deposits observe that the rates paid on these deposits are not keeping pace with the increases in market rates, they will redeploy some of their M2 holdings into higher yielding money market instruments and thus depress M2 growth. Gradually, as market rates stabilize, rates offered on most M2 deposits tend to catch up with the adjustment in market rates, and the opportunity cost of holding M2 moves back toward its usual level. As this happens, people readjust the proportion of their financial assets in M2 toward the earlier ratio, speeding up the growth of M2 in the process

The impact of a change in market interest rates on the growth of individual components of M2 depends on the speed at which the average offering rate for that component is adjusted. Banks typically adjust the offering rates on NOW accounts, money market deposit accounts (MMDAs), and savings accounts relatively slowly. Demand deposits pay no explicit interest by law, and implicit returns are altered gradually through adjustments to charges and services associated with the account. Rates on money market mutual funds and small time deposits respond much more quickly to changes in market rates.

The deceleration of M2 growth over the first two quarters of 1989 largely resulted from changes in the opportunity cost of holding money and from the unexpectedly large tax liabilities faced by individuals in April. The average spread between market rates and those on M2 deposits widened in the first quarter; how-

[15]See David H Small and Richard D Porter, "Understanding the Behavior of M2 and V2," *Federal Reserve Bulletin*, April 1989, pp 244-54

Chart 5A

M2: Levels and Target Ranges

Cones and Tunnels

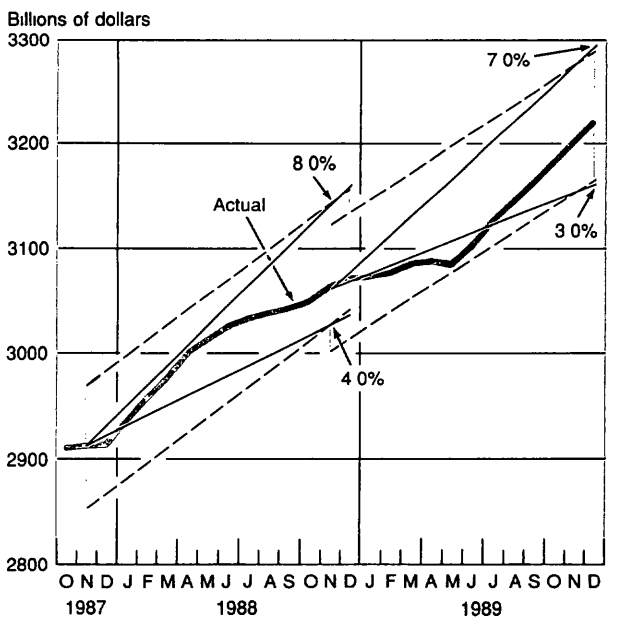


Chart 5B

M3: Levels and Target Ranges

Cones and Tunnels

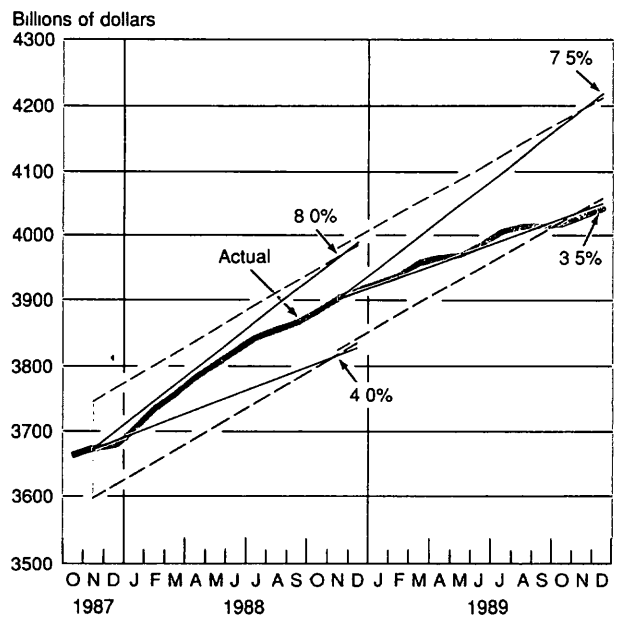


Chart 5C

Total Domestic Nonfinancial Debt Levels and Monitoring Ranges

Cones and Tunnels

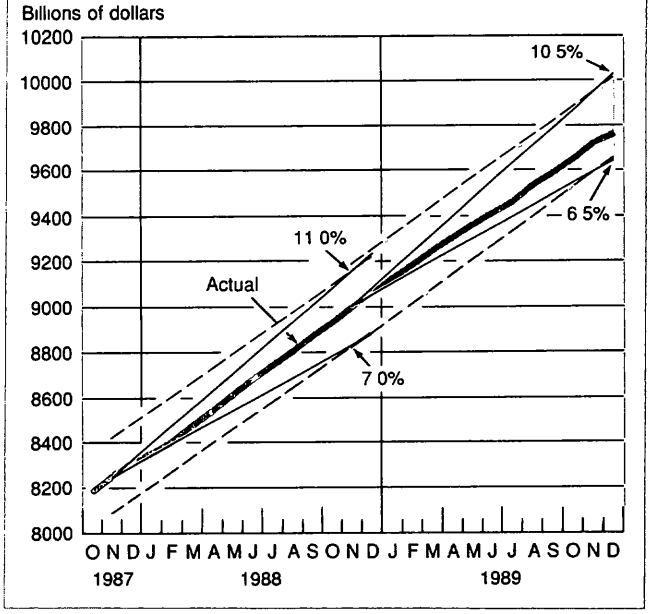
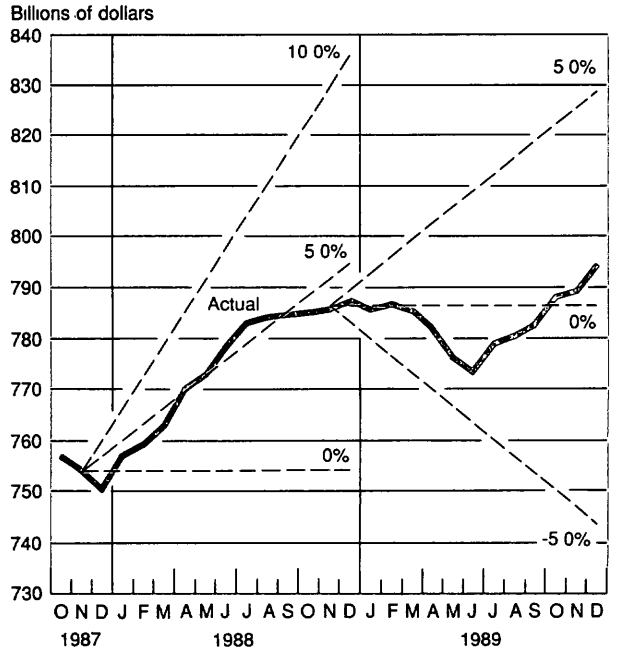


Chart 5D

M1 Levels and Growth Rates



ever, it began to narrow in the second quarter as market rates fell from their highs and deposit rates lagged behind. Funds may have been funneled into taxes or nonmonetary assets rather than into M2 deposits—noncompetitive tenders at Treasury security auctions were already quite large during the first quarter. Deposits whose rates adjust slowly contracted markedly during the first two quarters, with especially pronounced outflows in April and May, when individuals appear to have drawn down their existing balances in these accounts to meet unanticipated tax obligations. The sizable declines in demand and other checkable deposits over the first half of the year caused M1 to fall sharply. Within M2, however, the contraction of deposits with relatively unresponsive rates was offset by gains in small time deposits and money market mutual funds, especially in the second quarter, when the average rates on small time deposits and money funds exceeded those on six-month Treasury bills. On balance, M2 expanded at an anemic 2 0 percent rate over the first two quarters, while M1 fell at a 2.3 percent annual rate.

The weak expansion of M2 depressed M3 growth. The non-M2 component of M3 grew briskly in the first quarter as banks stepped up their issuance of large time deposits to help fund the modest pace of loan expansion. The growth of these managed liabilities moderated in the second quarter because banks were able to fund credit expansion, which remained modest, with tax-swollen Treasury tax and loan account balances. Thrift issuance of managed liabilities slowed from its pace in the latter half of 1988, perhaps reflecting heavier reliance on Federal Home Loan Bank advances to fund credit expansion. On net, M3 grew at a 3.6 percent rate over the first two quarters of the year.

At the time of the FOMC's midyear review of the growth of the aggregates, M2 was about 1 percentage point below the lower bound of its growth cone, while M3 was at its lower bound. Total financial debt stood in the middle of its monitoring range. M1, meanwhile, was considerably below the level it had attained on average during the fourth quarter of 1988. M2 and M3 were expected to show stronger growth in the second half of the year in light of the recent declines in market interest rates. Furthermore, these aggregates were expected to finish the year well within their target ranges. Against this background, the Committee reaffirmed the 1989 target and monitoring ranges.

Over the second half of the year, M2 growth accelerated markedly as the opportunity cost of holding deposits narrowed. Deposits with relatively unresponsive rates expanded considerably and nearly recovered the outflows of the first half of the year. Money market mutual funds showed sizable monthly increases, despite the narrowing spread of their offering rates over market rates. The strong inflows into these funds likely reflected the fact that their rates exceeded those on other monetary instruments. In addition, because money market funds are perceived as a means of avoiding the volatility of bond and equity funds, they may also have benefited from the mounting losses on junk bond funds and the sharp drop of stock prices on October 13. The growth of small time deposits slowed, in part because their rate advantage over some market rates eroded markedly. On balance, M1 and M2 grew at rates of 3.5 and 7.1 percent, respectively, over the final two quarters.

The troubles of the thrift industry appear to have affected the composition of M2 but not its overall growth. Thrift small time deposits declined from September through December, while other retail thrift deposits grew slowly. The fall in thrift small time deposits probably reflected the shrinking spread between thrift and commercial bank rates on these deposits. With regulators actively discouraging thrifts from offering unduly high rates and with troubled institutions (which generally offered the highest rates) being seized, thrift rates on small time deposits declined more than those offered by commercial banks. The shrinkage in thrift small time deposits, together with the modest growth of other thrift M2 deposits, appears to have been offset by flows into commercial bank deposits and money market mutual funds. Consequently, commercial banks held a greater share of M2 deposits at the end of the year than at the beginning.

Unlike M2 growth, the growth of M3 in the second half of the year was significantly restrained by the restructuring of the thrift industry. FIRREA imposed strict capital requirements on thrifts, placed limitations on the structure of their portfolios, and provided for the use of RTC funds to pay off depositors at liquidated institutions. FIRREA had its most pronounced impact on M3 through its effect on the funding practices of inadequately capitalized thrifts. These thrifts were required to reduce their balance sheets, and they did so by restricting their issuance of term repurchase agreements and large time deposits over the second half of the year.[16] Together, these liabilities fell at a 34 percent annual rate over the final two quarters. Meantime, banks funded the modest pickup in credit expansion with M2 deposits so that their issuance of managed liabilities was weak. On net, M3 expanded at

[16]Thrifts also reduced their issuance of overnight RPs, which were added to M2 in the 1990 redefinition of that aggregate. From June to December 1989, overnight thrift RPs shrank by $1 1 billion, they stood at $2 5 billion in December. Although the decline was sharp, the RPs represent such a small share of the broader aggregates that the impact on M2 and M3 growth was minor.

a modest 2.9 percent rate over the final half of the year.

The income velocities of the monetary aggregates all grew faster than their 1982-88 average rates of growth (Chart 6).[17] The velocity of M2 increased at a 1.8 percent rate in 1989, compared with a 2.1 percent rate in 1988. The velocities of M3 and M1 advanced far more quickly than in 1988. M3 velocity grew 3 percent, while M1 velocity grew 5.8 percent. They had advanced 1.2 and 3.1 percent, respectively, in 1988. The velocity of nonfinancial debt fell 1 5 percent, a slightly greater rate of decline than in the previous year.

Policy implementation

In 1989, the FOMC expressed its desired policy stance in terms of the degree of reserve pressure, a practice it has followed, with some modifications, since 1983. The intended degree of reserve pressure is described as a designated amount of adjustment and seasonal borrowing at the discount window. The Trading Desk uses this indicated amount of borrowing to derive the objective for nonborrowed reserves for the two-week reserve maintenance period. The nonborrowed reserve objective is obtained by estimating the demand for total reserves, constructed by projecting required reserves and desired excess reserves, and then subtracting from that estimate the intended level of discount window borrowing. Revisions are made to the objective during the maintenance period when new information suggests modifications to the estimated demand for total reserves. To achieve the nonborrowed reserve objective, the Desk conducts open market operations to increase or decrease the supply of nonborrowed reserves; however, the supply of nonborrowed reserves in the banking system is also influenced by the movements of various "operating factors" over which the Desk has little control As a result, when the Desk undertakes its operations, it faces uncertainties both about reserve demand and about the amount of reserves supplied by the operating factors.

For a given level of the discount rate, higher levels of borrowing have typically been associated with firmer money market rates because limitations are placed on access to the discount window. When higher amounts of borrowing are desired, fewer nonborrowed reserves are supplied for a given level of demand for total reserves. With nonborrowed reserves less plentiful and with frequent or heavy use of the discount window discouraged, depository institutions bid more aggressively for reserves in the money market and ultimately cut back on their lending and investing. In this process, short-term interest rates rise.[18]

During 1989, however, as in some previous years, the relationship between the amount of borrowing and the degree of money market firmness, as measured by the spread between the federal funds rate and the discount rate, was somewhat unreliable. For the most part, banks appeared less inclined to borrow adjustment credit than in earlier years. The unusual reluctance of banks to borrow from the discount window complicated the Desk's implementation of policy through use of the borrowed reserve procedure throughout 1989 and encouraged a flexible interpretation of the objectives for nonborrowed and borrowed reserves.

As the 1988 report on open market operations related more fully, banks have shown particular reluctance to borrow on a number of other occasions in the 1980s.[19] In late 1988, the relationship between borrowing and the federal funds–discount rate spread appeared to shift once more Banks became even less disposed to borrow adjustment credit than they had been earlier in the year; thus, a much larger spread between the federal funds rate and the discount rate was needed in order to induce banks (in the aggregate) to borrow the same amount that they would have before the shift. As a consequence, strict adherence to the nonborrowed reserve objective implied by a given level of assumed borrowing would often have forced federal funds to trade persistently at rates that were higher than those anticipated by the FOMC. In both 1988 and 1989, the Committee responded to these shifts by taking account of the observed degree of reluctance to borrow when it chose the borrowing allowances However, it recognized the persisting uncertainty about the relationship between borrowing and the federal funds rate and thus encouraged the Desk to view the assumed levels of borrowing flexibly in order to achieve the desired degree of restraint. (Notes on the FOMC directives and the borrowing assumptions used to construct the reserve paths are in Table 1) The Desk exhibited flexibility by accepting deviations of borrowing from its assumed level when the deviations were consistent with holding to the money market conditions anticipated by the FOMC.

Adjustment and seasonal borrowing fell short of the desired level in four of the first five maintenance periods of the year. (Actual reserve data appear in Table 2.) Consequently, a decision was made to allow

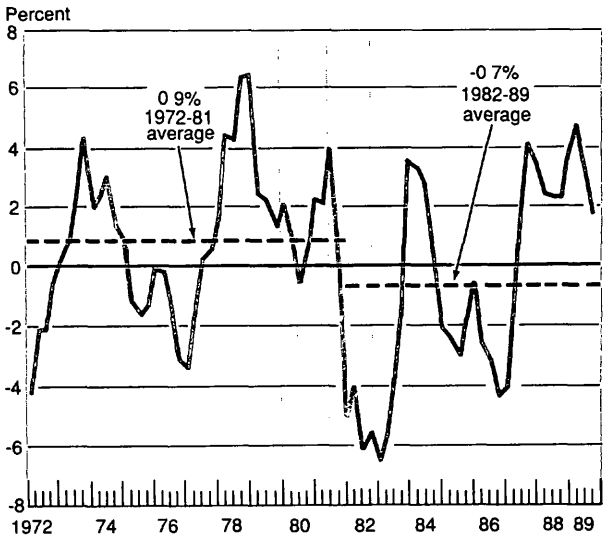
[17]The income velocity of an aggregate is the ratio of nominal GNP to the level of the aggregate

[18]For a more detailed description of the borrowed reserve procedure, see Brian F Madigan and Warren T Trepeta, "Implementation of U S Monetary Policy," in *Changes in Money-Market Instruments and Procedures Objectives and Implications*, Bank for International Settlements, March 1986

[19]"Monetary Policy and Open Market Operations during 1988," Federal Reserve Bank of New York *Quarterly Review*, Winter-Spring 1989, pp 83-102

Chart 6A

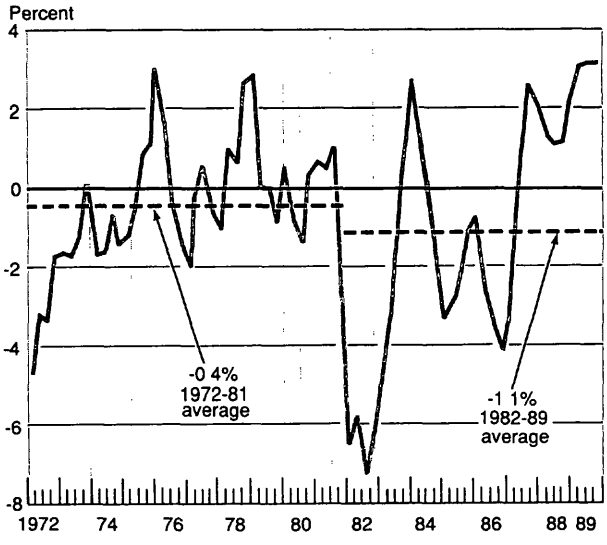
M2 Velocity Growth



Notes Velocity growth is measured from four quarters earlier
Shaded areas represent periods of recession as defined by the National Bureau of Economic Research

Chart 6B

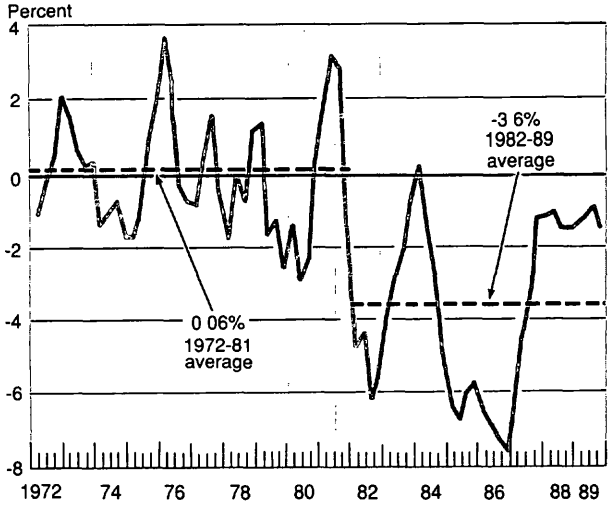
M3 Velocity Growth



Notes Velocity growth is measured from four quarters earlier
Shaded areas represent periods of recession as defined by the National Bureau of Economic Research

Chart 6C

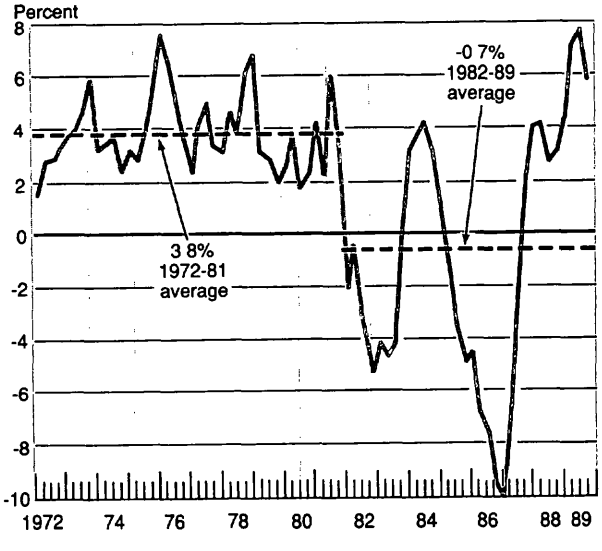
Total Domestic Nonfinancial Debt Velocity Growth



Notes Velocity growth is measured from four quarters earlier
Shaded areas represent periods of recession as defined by the National Bureau of Economic Research

Chart 6D

M1 Velocity Growth



Notes: Velocity growth is measured from four quarters earlier
Shaded areas represent periods of recession as defined by the National Bureau of Economic Research

for the increased reluctance of banks to approach the discount window by reducing the borrowing allowance, on March 9, to a level that was in line with actual experience and that would maintain the existing policy stance. (Policy had been firmed in January and February.) This diminished desire by banks for adjustment credit persisted for the remainder of the year. With adjustment borrowing generally running at low levels, swings in seasonal credit tended to dominate movements in the series "adjustment plus seasonal borrowing."

Adjustment borrowing was particularly light over the last half of the year, when the funds rate generally exceeded the discount rate by smaller amounts than in the first half of the year. Adjustment credit was frequently quite low until the final day of a maintenance period, when borrowing sometimes rose in the face of settlement-day pressures. As the FOMC eased reserve pressures over the second half of the year, adjustment borrowing tailed off to average about $165 million over the final thirteen maintenance periods of the year, and even this average was lifted by intervals of somewhat heavier borrowing associated with natural disasters and year-end pressures Adjustment credit averaged less than $50 million during the September 6, November 1, and December 13 periods. In the September 6

Table 1

Specifications for Directives of the Federal Open Market Committee and Related Information

Date of Meeting	Specified Short-Term Growth Rates M2	Specified Short-Term Growth Rates M3	Borrowing Assumption for Deriving NBR Path	Discount Rate	Committee Preference	Prospective Reserve Restraint Modifications: Guidelines for Modifying Reserve Pressure	Prospective Reserve Restraint Modifications: Factors to Consider for Modifications (In Order Listed) 1	2	3	4
	(Percent)		(Millions of Dollars)	(Percent)						
12/13 to 12/14/88	November to March 3	6½	400 500 on 12/15 600 on 1/5	6 50	Sought to increase somewhat the degree of pressure on reserve positions	A somewhat greater degree would be acceptable A slightly lesser degree might be acceptable	Indications of inflationary pressure	Strength of the business expansion	Behavior of the monetary aggregates	Developments in foreign exchange and domestic financial markets
2/7 to 2/8/89	December to March 2	3½	600 700 on 2/14† 500 on 3/9‡	6 50 7 00 on 2/24	Sought to maintain the existing degree of pressure on reserve positions	A somewhat greater degree would be acceptable A slightly lesser degree might be acceptable	Indications of inflationary pressure	Strength of the business expansion	Behavior of the monetary aggregates	Developments in foreign exchange and domestic financial markets
3/28/89	March to June 3	5	500	7 00	Sought to maintain the existing degree of pressure on reserve positions	A somewhat greater degree would be acceptable A slightly lesser degree might be acceptable	Indications of inflationary pressure	Strength of the business expansion	Behavior of the monetary aggregates	Developments in foreign exchange and domestic financial markets
5/16/89	March to June 1½	4	500 600 on 5/17‡ 500 on 6/6	7 00	Sought to maintain the existing degree of pressure on reserve positions	A somewhat greater or somewhat lesser degree would be acceptable	Indications of inflationary pressure	Strength of the business expansion	Behavior of the monetary aggregates	Developments in foreign exchange and domestic financial markets
7/5 to 7/6/89	June to September 7	7	500 600 on 7/7§ 550 on 7/27	7 00	Sought to decrease slightly the degree of pressure on reserve positions	A somewhat greater or somewhat lesser degree would be acceptable	Indications of inflationary pressure	Strength of the business expansion	Behavior of the monetary aggregates	Developments in foreign exchange and domestic financial markets

†On February 23, the borrowing assumption was increased to $800 million, but it was returned to $700 million on the next day when the discount rate was raised

‡Borrowing assumption changed for technical reasons

§Change in borrowing assumption reflected a technical adjustment and a change in reserve pressures

period, when the spread between the funds and discount rates was 193 basis points, adjustment borrowing averaged a skimpy $31 million. This level was the lowest since July 1980, when the funds rate was below the discount rate. For the year, adjustment credit averaged $243 million per day, while the funds–discount rate spread averaged 228 basis points (Chart 7) Comparable figures for 1988 and 1987 were $293 million per day at an average spread of 137 basis points, and $286 million with an average spread of 100 basis points

The rise and fall of seasonal borrowing more or less followed its normal cyclical pattern over the year (Chart 8), although record high levels were attained during the summer, somewhat earlier than in 1988. These movements were accommodated through eight technical adjustments to the borrowing allowance between May and the year-end, two of which were accompanied by policy-induced changes. With seasonal credit climbing in the late spring and early summer, the assumed level of borrowing was raised in the May 17 and July 12 maintenance periods. While the May move was purely technical, the July increase was associated with a reduction of reserve pressures. This seemingly contradictory step reflected the preceding surge in seasonal borrowing, which necessitated an upward adjustment to the assumed level in order to leave reserve pressures unchanged. Since only a portion of the technical adjustment was offset by the FOMC's decision to reduce reserve pressures, the assumed borrowing level was higher following the easing move. After seasonal borrowing peaked in the July 26 maintenance period at an average $509 million per day, an all-time high, it fluctuated in a range of $485 million to $500 million over the three succeeding periods. The peak-period average in 1988 was $433 million (October 5 period), a previous record high. In 1987, when spreads

Table 1

Specifications for Directives of the Federal Open Market Committee and Related Information

(Continued)

Date of Meeting	Specified Short-Term Growth Rates M2	M3	Borrowing Assumption for Deriving NBR Path	Discount Rate	Committee Preference	Prospective Reserve Restraint Modifications: Guidelines for Modifying Reserve Pressure	Factors to Consider for Modifications (In Order Listed) 1	2	3	4
	(Percent)		(Millions of Dollars)	(Percent)						
8/22/89	June to September 9	7	550	7 00	Sought to maintain the existing degree of pressure on reserve positions	A slightly greater degree might be acceptable A slightly lesser degree would be acceptable	Progress toward price stability	Strength of the business expansion	Behavior of the monetary aggregates	Developments in foreign exchange and domestic financial markets
10/3/89	September to December 6½	4½	550 500 on 10/5‡ 400 on 10/19§ 350 on 11/2‡ 300 on 11/6 250 on 11/9‡	7 00	Sought to maintain existing degree of pressure on reserve positions	A slightly greater degree might be acceptable A slightly lesser degree would be acceptable	Progress toward price stability	Strength of the business expansion	Behavior of the monetary aggregates	Developments in foreign exchange and domestic financial markets
11/14/89	September to December 7½	4½	250 200 on 11/15‡ 150 on 12/11‡	7 00	Sought to maintain existing degree of pressure on reserve positions	A slightly greater degree might be acceptable A slightly lesser degree would be acceptable	Progress toward price stability	Strength of the business expansion	Behavior of the monetary aggregates	Developments in foreign exchange and domestic financial markets
12/18 to 12/19/89	November to March 8½	5½	150 125 on 12/20	7 00	Sought to decrease slightly the existing degree of pressure on reserve positions	A slightly greater or slightly lesser degree would be acceptable	Progress toward price stability	Strength of the business expansion	Behavior of the monetary aggregates	Developments in foreign exchange and domestic financial markets

†On February 23, the borrowing assumption was increased to $800 million, but it was returned to $700 million on the next day when the discount rate was raised

‡Borrowing assumption changed for technical reasons

§Change in borrowing assumption reflected a technical adjustment and a change in reserve pressures

between the federal funds rate and the discount rate were lower, the peak-period figure was $298 million (July 1 period).[20] As seasonal credit declined in the early fall, downward technical adjustments were made at the October 3 meeting and during the November 15 maintenance period (three times) and the December 13 maintenance period. In the November 1 period, the borrowing allowance was reduced both to lower reserve pressures and to account for the decline in the use of the seasonal borrowing privilege For the year as a whole, seasonal borrowing averaged $275 million per day, compared with $235 million in 1988 and $164 million in 1987.

[20]Seasonal borrowing tends to increase as the federal funds–discount rate spread rises, although traditionally it has not been as responsive to spread changes as adjustment borrowing

Open market operations and reserve management

In seeking to bring nonborrowed reserves into line with the objective, the Desk takes account of both the expected duration and day-to-day pattern of reserve needs (or surpluses) in determining the timing and size of its open market operations. Projected reserve supplies are compared with the projected nonborrowed reserve objectives for the current maintenance period and a few subsequent periods. In choosing between permanent and temporary operations, the Desk considers whether the projected need to add (or drain) reserves is expected to persist for several consecutive maintenance periods If so, the Desk typically opts to address a portion of the need (or surplus) with outright purchases (or sales) of securities.

The Desk's 1989 open market operations, in both their nature and their timing, differed substantially from

Table 2

1989 Reserve Levels

(In Millions of Dollars, Not Seasonally Adjusted)

Period Ended	Required Reserves (Current)	Required Reserves (First Published)	Excess Reserves (Current)	Excess Reserves (First Published)	Total Reserves	Adjustment and Seasonal Borrowed Reserves	Nonborrowed Reserves plus Extended Credit Borrowed Reserves (Current)	Nonborrowed Reserves plus Extended Credit Borrowed Reserves (First Published)	Nonborrowed Reserves Interim Objective†	Extended Credit Borrowed Reserves
Jan 11	64,256	64,397	1,147	991	65,403	840	64,563	64,548	64,793	1,208
25	61,786	61,735	972	1,070	62,757	499	62,258	62,307	62,116	1,028
Feb 8	60,035	60,138	1,543	1,504	61,578	478	61,100	61,162	60,743	792
22	59,278	59,269	1,016	1,036	60,293	366	59,928	59,939	59,464	1,111
Mar 8	59,490	59,533	957	915	60,446	550	59,897	59,898	59,774	1,250
22	59,299	59,305	735	805	60,034	422	59,612	59,689	59,754	1,164
Apr 5	58,977	58,924	1,305	1,550	60,282	502	59,781	59,973	59,376	1,675
19	61,190	61,107	223	289	61,413	612	60,801	60,785	61,549	1,970
May 3	60,345	60,339	1,241	1,301	61,586	581	61,005	61,059	60,742	1,387
17	58,357	58,382	859	960	59,216	533	58,683	58,809	58,677	1,206
31	56,877	56,923	1,158	1,139	58,034	501	57,534	57,563	57,269	1,148
June 14	59,012	59,187	897	817	59,909	469	59,440	59,537	59,670	1,657
28	58,154	58,069	901	976	59,054	678	58 376	58,366	58,548	287
July 12	60,067	60,060	990	953	61,057	571	60,486	60,442	60,409	146
26	58,807	58,883	1,035	915	59,842	591	59,251	59,206	59,232	90
Aug 9	58,766	58,659	715	812	59,481	621	58,860	58,851	59,058	55
23	58,859	58,737	951	1,104	59,810	709	59,102	59,132	59,137	44
Sept 6	58,247	58,153	959	1,051	59,206	516	58,691	58,689	58,725	22
20	60,195	60,000	888	1,079	61,083	593	60,491	60,487	60,400	21
Oct 4	58,343	58,117	996	1,160	59,338	873	58,466	58,404	58,518	25
18	60,186	60,110	926	1,045	61,112	634	60,478	60,521	60,560	19
Nov 1	58,827	58,857	1,128	1,166	59,955	322	59,633	59,701	59,447	23
15	60,139	60,279	881	763	61,020	252	60,768	60,790	61,029	20
29	59,958	60,073	1,009	868	60,968	418	60,550	60,523	60,823	23
Dec 13	61,149	61,253	759	666	61,908	129	61,779	61,789	62,024	22
27	62,015	62,019	1,018	1,022	63,033	332	62,701	62,708	62,708	19

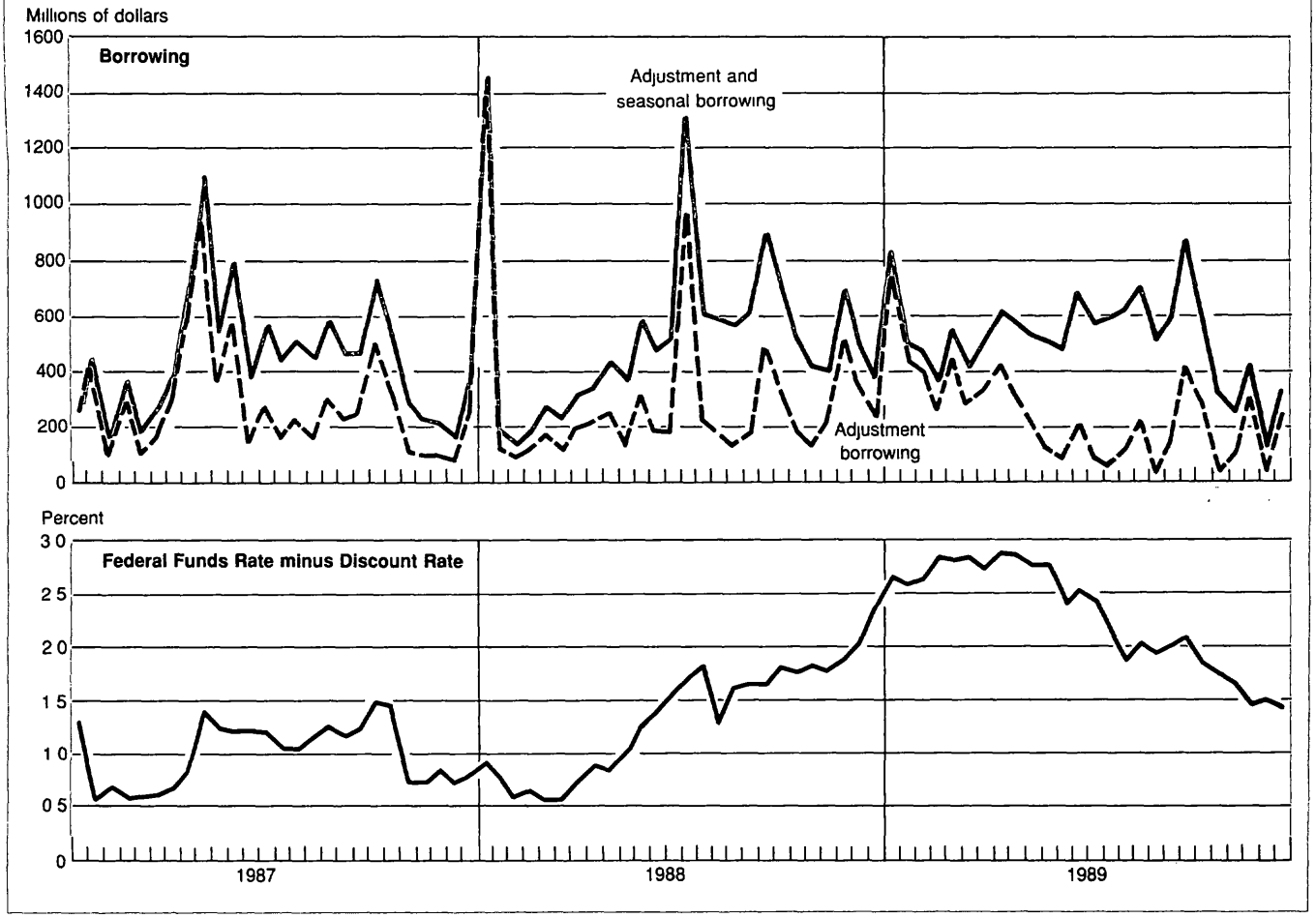
†As of final Wednesday of reserve period

those of earlier years Heavy purchases of foreign currencies in foreign exchange markets by U.S. monetary authorities added considerably to nonborrowed reserves. All intervention took the form of dollar sales (that is, purchases of foreign currency) and totaled an unprecedented $22 billion on behalf of both the Federal Reserve and the Treasury The intervention was most heavily concentrated in the May-to-July period, when these sales totaled $11.9 billion — the largest U.S. intervention for any three-month reporting period. Another $5.9 billion was sold in the August-to-October interval.

The reserve impact of the 1989 dollar sales depended on how they were financed In accord with typical practice, official U S. intervention generally was shared equally by the U.S Treasury, acting through the Exchange Stabilization Fund (ESF), and the Federal Reserve System. The Federal Reserve's share of the 1989 intervention created reserves because the intervention took the form of foreign currency purchases, paid for with reserve-creating dollars In early 1989, as in most other years, the ESF's share of dollar sales had no reserve impact. The U.S Treasury offset the reserve impact of the intervention by adjusting its balance at the Federal Reserve; it called in funds from its tax and loan accounts at depository institutions or reduced the size of a direct investment into those accounts. By March, however, the ESF had exhausted its supply of dollars to sell. Between mid-March and late May, it raised dollars by selling International Monetary Fund Special Drawing Rights (SDRs) to the Federal Reserve. Because the proceeds of the monetization were held in the ESF's account at the Fed until the funds were used by the ESF, the intervention

Chart 7

Borrowing and the Spread between Federal Funds and the Discount Rate



financed by this method added reserves to the banking system at the time that the intervention settled. From mid-June to the end of the year, the Treasury funded its intervention operations by warehousing foreign currency with the Federal Reserve. Under this technique, the System buys foreign currency in a spot purchase from the ESF and simultaneously agrees to sell it back to the ESF at the same exchange rate at a future date. (Such warehousing operations have been executed from time to time since 1963.) A reserve injection occurs at the time that the warehousing transaction settles because the ESF invests the proceeds with the Treasury, which in turn deposits them into its tax and loan accounts at commercial banks or reduces the amount it otherwise would call in from these accounts.[21]

The rise in the System's holdings of foreign currency and SDRs provided a total of about $23 billion of reserves during 1989 (December over December). The increase in the System's foreign currency assets added $19.7 billion of reserves in 1989—compared with $2.1 billion in 1988—while the ESF's monetization of SDRs added $3.5 billion of reserves. The System's share of intervention operations accounted for about $11 billion of the total increase in its foreign currency holdings, while warehousing of foreign currency for the ESF totaled $7 billion. Of the remaining rise in the System's foreign currency holdings, roughly $750 million stemmed from its portion of a swap arrangement with the Bank of Mexico and about $1 billion from interest earned on its foreign currency holdings.

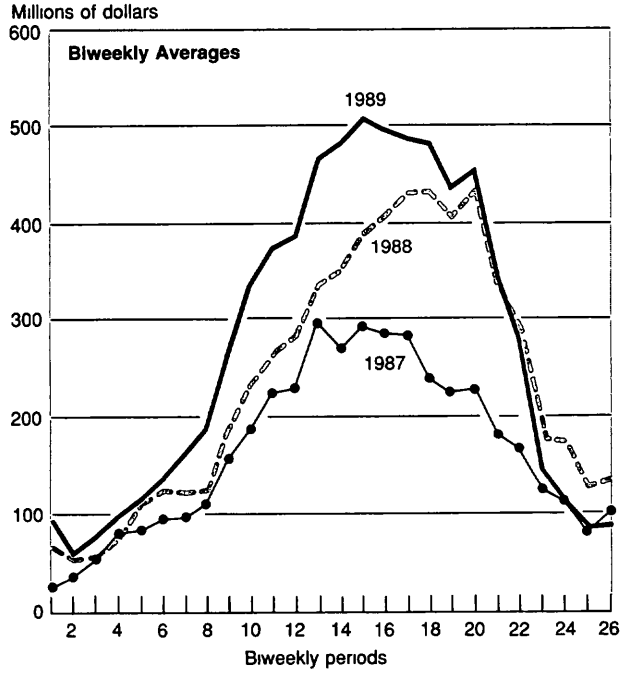
The reserve provision from foreign currency purchases and monetization of SDRs more than met the need for reserves for the year. The need to replenish the supply of nonborrowed reserves primarily arose from the $12.3 billion increase in currency outstanding. (This increase was only about three-quarters of the 1988 rise.) Reserves were also drained by the $1.2 billion decline in extended credit borrowing (ECB).[22] The major user of the program was taken over by the Federal Deposit Insurance Corporation (FDIC), and the FDIC paid off the user's borrowing in mid-June. On net, other operating factors added a modest amount of reserves. Meanwhile, required reserves showed their first decline since 1983, and excess reserves dropped modestly. Because the supply of nonborrowed reserves from operating factors (including foreign currency holdings and ECB) exceeded demand, the size of the System's portfolio was reduced over 1989 for the first time since 1957. The $10.2 billion decline in the portfolio left its year-end level at $235.6 billion.[23]

The reduction of the System's portfolio in 1989 was accomplished through redemptions of Treasury bills at auctions and through sales of Treasury securities in the market and to foreign customer accounts. Typically, the Desk exchanges its maturing holdings of Treasury securities for new securities at auction time. However, the Desk may choose to roll over only a portion of its holdings, as it did frequently in 1989, and thus drain reserves. The Desk redeemed a total of $13.2 billion of Treasury securities in 1989 (The figure includes a $3.5 billion forced redemption on November 2, discussed below.) The total includes $500 million of Treasury notes redeemed in late September—only the second time that the System has chosen to redeem coupon

[21]A more extensive discussion of Treasury tax and loan accounts appears below

Chart 8

Seasonal Borrowings



[22]ECB is viewed by the Desk as nonborrowed reserves because institutions using the ECB program cannot easily replace funds obtained through the ECB facility with other types of funding, these institutions are under pressure to achieve improvements in their troubled funding situations

[23]The total reflects the commitment to purchase $200 million of Treasury securities from customer accounts made on the last business day of 1989, for delivery on January 2, 1990 It excludes the temporary reduction of the portfolio from that day's matched sale-purchase transaction with foreign accounts, the sale included a commitment to repurchase the securities on January 2

issues.[24] The redemptions were heaviest in the May-to-July period, reflecting the need to offset foreign exchange intervention. This intervention also prompted the Desk to sell a record volume of bills in the market on July 12, an unusual action for that time of year. The $4.6 billion sale was the Desk's largest outright sale, exceeding the previous record by $1.5 billion. The Desk also sold Treasury bills in February, when the seasonal drop in currency and in required reserves produced a sizable need to drain reserves. Finally, the Desk drained $1.3 billion of reserves in 1989 through net sales of Treasury securities to foreign customer accounts In 1988, it had made net purchases from these accounts that added $4.3 billion of reserves

Nevertheless, the Desk at times arranged outright purchases of securities to address seasonal reserve needs, such as those that arose around tax dates and around year-end. The Desk favored Treasury bill purchases on these occasions to offset part of the decline in its bill holdings from redemptions and sales The Desk purchased both coupon issues and bills in April and bills on two occasions in November. The April purchases were smaller than those of 1988 because foreign exchange intervention reduced projected reserve needs below the norm for late May. The Desk's purchase of bills in early November was prompted by its forced redemption of bills at the October 30 auction. The Treasury announced a settlement date for that auction of Tuesday, October 31, rather than Thursday, November 2, when the outstanding bills were to mature, because the debt ceiling was scheduled to drop on November 1. The Desk is not permitted to buy securities directly from the Treasury except in exchange for maturing issues. Consequently, the timing disparity forced the desk to redeem its $3 5 billion of maturing bills.

The net shrinkage in the System portfolio occurred in its bill holdings, which fell by $11.3 billion, in contrast with a rise of $5.4 billion in 1988 The Desk increased the System's holdings of coupon issues by $1.3 billion in 1989, compared with $9.7 billion in 1988. As a result, the average maturity of the System portfolio lengthened a bit in 1989. Redemptions reduced System holdings of federally sponsored agency securities by about $440 million, a decrease just slightly less than in the previous year.[25]

The Desk also met reserve needs through temporary transactions. When determining the timing of these operations, it took into account the intraperiod distribution of reserve needs (surpluses). The Desk sought to avoid extraordinary reserve deficiencies or surfeits on individual days because both could induce movements in the federal funds rate that might give misleading signals about the intent of policy. Moreover, a sizable daily reserve deficiency might leave the banking system with inadequate reserves for the purpose of clearing transactions, lead to extraordinary pressures in the reserve market, and force spikes in discount window borrowing that could preclude achieving the path level.

The Desk arranged about the same volume of temporary transactions in the market in 1989 as in 1988 Because of reserve injections associated with foreign exchange intervention, the Desk made much greater use of temporary transactions to withdraw reserves in 1989. The volume of matched sale-purchase transactions represented just over one-third of total temporary market transactions in 1989, in contrast to the smaller shares of previous years The Desk arranged 69 rounds of matched sale-purchase agreements in the market for a total of $151 billion, compared with the 22 rounds for $63 billion that it had executed in 1988. Nearly two-thirds of these reserve draining operations spanned more than one business day.

A smaller volume of repurchase agreements (RPs) was executed in 1989 than in previous years because of the substantial reserve injections associated with foreign currency intervention. Over the year, the Desk arranged 28 rounds of System RP transactions for a total of $168 billion, and 61 rounds of customer-related RPs for a total of $108 billion. Comparable figures for 1988 were 51 rounds of System RPs for $210 billion, and 85 rounds of customer RPs for $143 billion. Although the Desk conducted fewer rounds of System RPs, the average daily volume of those RPs was $7.7 billion, or $3.7 billion greater than in 1988. The higher average volume stemmed partly from the decision to undertake a smaller volume of outright purchases of securities to meet the reserve needs arising around the April tax date. The Desk met these needs primarily through temporary operations rather than through its usual outright operations since the reserve shortages were not expected to extend over several periods (and since actual reserve needs exceeded projections). In the May 3 and 17 maintenance periods, the Desk preannounced term System RPs on three occasions to ensure adequate propositions. On May 4, the Desk arranged a record $15.8 billion of System RPs to meet part of the reserve needs

The Desk frequently conducted temporary operations in response to large day-to-day variations in reserve availability It also recognized that short-term transac-

[24] The Desk redeemed a very modest amount of coupon issues in 1987 because it purchased some maturing notes from foreign accounts between the time of the auction for the replacement issue and the settlement day for that auction

[25] The Desk normally rolls over maturing federally sponsored agency issues Its holdings decline when issues are called or when issues mature and no eligible replacement is available

tions might at times help provide clearer policy guidance to financial market participants. Market participants often judged whether the policy stance had changed by observing the Desk's use or eschewal of short-term transactions. However, they did not always interpret Desk actions correctly.

A technical reserve injection on the day before Thanksgiving was misinterpreted by market participants, and subsequent efforts by the Desk to correct the misimpression caused heavy borrowing in the November 29 maintenance period. On November 22, the Desk faced a fair-sized need to add reserves for the maintenance period then in progress, and large daily reserve deficiencies were projected for that day and for the remaining days of the period. During most of the morning of November 22, federal funds were trading at 8 7/16 percent, just slightly below the 8 1/2 percent rate that participants perceived to be consistent with the FOMC's desired degree of reserve restraint. It was anticipated that many market participants would be on vacation on Friday, the day after Thanksgiving, making for relatively inactive securities trading and financing activity. In these circumstances, the Desk was concerned that a delay in addressing the estimated reserve shortage could leave very large reserve needs toward the end of the period that might be difficult to meet. Hence, it decided to arrange five-day System RPs to meet the projected reserve shortage. Shortly before the Desk's regular time to enter the market, the funds rate slipped to 8 3/8 percent. Nonetheless, the Desk felt that its absence that day could lead to strains in the reserve market. When the Desk announced its operation, some market participants thought the action might be signaling a move to ease policy.

On the Friday after the holiday, these misimpressions were reinforced by an erroneous newspaper article that cited "government officials" as confirming an easing step. The Desk attempted to dispel these notions by temporarily draining reserves from the banking system that morning even though a reserve need remained. Federal funds were trading at 8 1/4 percent during most of the morning, however, the funds rate dipped to 8 3/16 percent just before the Desk acted. In that circumstance, many observers interpreted the operation as signaling the extent of the downward adjustment to the funds rate and as indicating the Committee's support for an 8 1/4 percent funds rate. The funds rate retained a soft tone over the afternoon (although it firmed a bit at the close), and the reserve data released that afternoon were not interpreted by participants as showing an insurmountable reserve need The misperception persisted into the following Monday morning, November 27. After discussion at an FOMC conference call on Monday morning, the Desk entered the market before its customary time and drained reserves even though a large deficiency was anticipated. The drain corrected the market's misimpression of the policy stance but left very large reserve needs, which were met with heavy borrowing that evening and with large RP operations over the next two days.

The miscommunication resulted from a confluence of factors. The FOMC's previous decision to reduce reserve pressures, made in early November, had come as a surprise to market participants, who had not been expecting such a move until later in the month or at the time of the Committee's December meeting. On November 22 there was some speculation that another step might be in the offing, but discussions between Desk personnel and market participants did not indicate a widespread expectation of an imminent easing, even though the durable goods report released that morning had been weaker than anticipated. Moreover, analysts generally viewed the reserve need as being smaller than suggested by the Desk's projections, so they did not anticipate that a System operation would be necessary. Finally, the newspaper article seemed to confirm the view, which had previously been just a suspicion, that an easing had occurred.

Forecasting reserves and operating factors

When the Desk formulates a strategy for meeting reserve needs, it takes account of potential revisions to the estimated demand for and supply of reserves. On the demand side, these revisions can take the form of changes in estimated required reserve levels or in the banking system's desired excess reserve balances On the supply side, revisions to estimated operating factors, or sources and uses of nonborrowed reserves other than open market operations, can change the reserve outlook In both cases, revisions late in the maintenance period are especially difficult to deal with since they may necessitate very large reserve operations.

The accuracy of required reserve forecasts was about unchanged in 1989 relative to the previous year. The mean absolute error in forecasting required reserves on the first day of the period was around $325 million in 1989, compared with about $300 million in 1988.[26] This steady forecasting performance came despite an increase of $125 million in the mean absolute period-to-period change in required reserves Forecasts became more accurate as the maintenance period progressed; the mean absolute prediction error

[26]The Trading Desk uses forecasts of required reserves, excess reserves, and operating factors made by both the Federal Reserve Bank of New York and Board staffs When a range of forecast errors is given in the following discussion, it reflects the two staffs' varying degrees of success in forecasting reserve measures

fell to roughly $200 million at midperiod and to about $70 million to $90 million on the final day. These errors are a bit larger than their 1988 counterparts. In addition, some sizable revisions took place after the maintenance period ended, especially late in the year.

Excess reserves were somewhat more predictable in 1989 than in 1988. The beginning-of-period mean absolute forecast errors were about $135 million to $150 million, compared with $160 million in 1988.[27] The mean absolute period-to-period change in excess reserves was about the same as in 1988. The largest forecast errors occurred in the April 19 maintenance period, when excess reserves averaged $223 million, the lowest level since contemporaneous reserve accounting was introduced in February 1984.

The average level of excess reserves held by the banking system shrank to $970 million in 1989 from just over $1 billion in 1988. Excess reserves had risen each year from 1979 through 1987, and then had stabilized in 1988. Provisions of the Monetary Control Act of 1980 that were phased in between 1980 and 1987 expanded the number of institutions subject to reserve requirements and resulted in increased excess reserve holdings In addition, rising Fedwire activity increased the need for reserve balances at the Federal Reserve.[28] Since large banks tend to monitor their reserve balances closely to avoid holding non-interest-bearing excess reserves, their average holdings of excess reserves over a year are typically close to zero These banks generally make use of the carryover privilege, under which banks can apply a portion of the excess reserves held in one period to their requirements in the following period. Carryovers tend to produce a sawtooth pattern of excess reserve holdings at large banks, and during 1989 this pattern at times showed through to aggregate excess reserve holdings. Smaller banks, however, generally lack the resources to monitor their reserve positions accurately, and they tend to hold positive levels of excess reserves.

Despite a marked jump in the variability of operating factors from period to period in 1989, the accuracy of operating factor forecasts was about the same as in 1988. The mean absolute error of first-day forecasts was about $900 million to $1.1 billion in 1989, compared with $900 million to $1 billion in the previous year. Although projections of reserves supplied by operating factors improved as the period progressed, the average absolute errors increased relative to their 1988 levels. The mean absolute forecast error around midperiod was about $450 million, and that for the final day of the period was roughly $70 million to $90 million. In 1988, these errors were $325 million to $470 million and about $50 million, respectively.

The 1989 forecasting performance looks better when compared with the mean absolute period-to-period change in operating factors. The mean absolute change surged to $3.4 billion per period, up sharply from $2.0 billion in the previous year. As a proportion of the average absolute change, mean absolute errors in forecasting operating factors on the first day of the period were only about half as much as their 1988 counterparts.

Much of the increase in the average period-to-period change of operating factors reflected the behavior of the Treasury's balance at the Federal Reserve. The Treasury tries to maintain a $5 billion balance in this account.[29] Additional funds are held in Treasury tax and loan (TT&L) accounts at participating depository institutions.[30] If the Treasury anticipates that its balance will fall below the $5 billion target level, it may "call" funds from its TT&L accounts to bring its balance up to the target level. Similarly, if the Treasury's balance at the Federal Reserve is expected to exceed $5 billion, the Treasury can directly place funds into these TT&L accounts. However, since depository institutions must fully collateralize and pay interest on TT&L funds, the institutions set limits on the total amount of funds they will accept based on their ability to make profitable use of these funds and on the availability of collateral. Treasury funds in excess of TT&L capacity must be held in the Treasury's Federal Reserve balance. Typically, around major tax dates, the Treasury's cash holdings substantially exceed the capacity of the TT&L accounts In 1989, capacity limitations forced the Treasury's Fed balance to exceed its target level on about fifty-five business days, compared with about forty days in 1988.

The mean absolute period-to-period change in the Treasury's balance rose to $2.8 billion in 1989 from $1.5 billion in 1988. The increased variability of the balance stemmed in part from an increase in tax receipts in 1989 relative to 1988, while the aggregate capacity of TT&L accounts remained about unchanged. With

[27]These reported forecast errors overstate the degree of uncertainty about excess reserves The Desk supplements beginning-of-period and midperiod forecasts with informal adjustments that are based on the observed pattern of estimated excess reserve holdings as each maintenance period unfolds

[28]See discussion in 1988 report, p 101 In 1989, the turnover rate of reserve accounts resumed its upward movement after having stalled in the previous year

[29]In late 1988, the Treasury raised this target level to $5 billion from $3 billion in order to reduce the likelihood of an inadvertent overdraft

[30]Individual nonwithheld taxes are paid directly into the Treasury's account at the Federal Reserve Most other Treasury tax receipts are initially deposited into TT&L accounts

TT&L capacity at roughly $30 billion, the substantially higher volume of tax payments received by the Treasury in 1989, especially in April and June, caused its balance at the Federal Reserve to surge to levels significantly above those in 1988. For example, the Treasury's balance at the Fed averaged $15.1 billion and $19 7 billion in the May 3 and 17 maintenance periods, respectively, but averaged only $9.2 billion and $9.6 billion for the corresponding periods in 1988 [31] The buildup and reduction of the Treasury's balance produced large changes from one period to the next, resulting in the 1989 rise of the absolute period-to-period change in this balance.

The forecast errors for the Treasury balance were a bit larger than in 1988. The mean absolute errors of the first-day forecasts were about $725 million to $800 million in 1989, compared with $700 million to $750 million in 1988. These errors were elevated somewhat by large forecast errors in the October 4 period. During this period, RTC payments fell well short of expectations. On September 29, the Treasury's Fed balance exceeded expectations by about $6½ billion to $7½ billion and thus contributed to a large forecast miss for the period-average Treasury balance.

Initial forecasts of U.S. currency, the foreign RP pool, float, and foreign currency were subject to sizable revisions as the maintenance period progressed. U.S. currency was difficult to predict in 1989, in part because it grew considerably more slowly than expected during most of the year but then experienced a year-end rise that was somewhat larger than usual The beginning-of-period mean absolute forecasting errors were about $350 million to $400 million, somewhat above their 1988 levels. Forecasting the foreign RP pool on a two-week average basis was also harder since the level of the pool was also somewhat more variable in 1989 than in 1988; the first-day average absolute forecast error was about $275 million. First-day forecasts of Federal Reserve float, including the so-called as-of adjustments that correct various reserve transfer errors, had mean absolute errors of about $200 million to $225 million. Forecasts of foreign currency had a beginning-of-period mean absolute error of about $200 million, however, this error overstates the uncertainty the Desk faced. The reserve effect of foreign currency intervention occurs two days after the transaction. The Desk was informed about the size of the intervention on the day before the transaction settled, so that it knew one day in advance what the reserve impact would be. Because the Desk was also informed about warehousing transactions before they occurred, the deterioration in forecast accuracy did not pose significant day-to-day difficulties in implementing policy.

[31] In 1989, the Treasury's Fed balance averaged $14 9 billion per day on those days when TT&L accounts were at capacity, compared with $10 7 billion in 1988