A BUSINESS AND FINANCIAL REVIEW BY THE FEDERAL RESERVE BANK OF CHICAGO

January/February 1981

ISSN 0164 - 0682

ECONOMIC PERSPECTIVES

The Midwest and the recession

Interest rate volatility in 1980

Economic events in 1980—a chronology

1980 developments in rural credit markets

CONTENTS

ECONOMIC PERSPECTIVES

January/February 1981, Volume V, Issue 1

Economic Perspectives is published bimonthly by the Research Department of the Federal Reserve Bank of Chicago. The publication is edited by Harvey Rosenblum, Vice President. The views expressed in **Economic Perspectives** are the authors' and do not necessarily reflect the views of the management of the Federal Reserve Bank of Chicago or the Federal Reserve System.

Single-copy subscriptions of **Economic Perspectives,** a bimonthly review, are available free of charge. Please send requests for single- and multiple-copy subscriptions, back issues, and address changes to Public Information Center, Federal Reserve Bank of Chicago, P.O. Box 834, Chicago, Illinois 60690, or telephone (312) 322-5112.

Controlled circulation postage paid at Chicago, Illinois.

The Midwest and the recession

George W. Cloos

For almost two years the economy has been stumbling on a rocky path marked by soaring inflation, record-high interest rates, and a constant specter of fuel shortages. During this period the Midwest, which includes the Seventh Federal Reserve District, has shouldered a disproportionate share of the trouble. Primarily, this reflects reduced demand for the products of some of the dominant industries in this region—cars and trucks, construction equipment, agricultural equipment, recreational vehicles, and home appliances. Residential construction also has been much more seriously depressed here than nationally, partly because of slower growth of population.

Some say that there has not been a recession anywhere *except* in the Midwest. This is an exaggeration. The sharp drop in general activity in the second quarter of 1980 was evident almost everywhere. Over the longer period the chronic problems of the motor industry have affected all regions to some degree. Finally, the impact of reduced availability of mortgage credit has dampened home building everywhere to some extent, even in the booming California market.

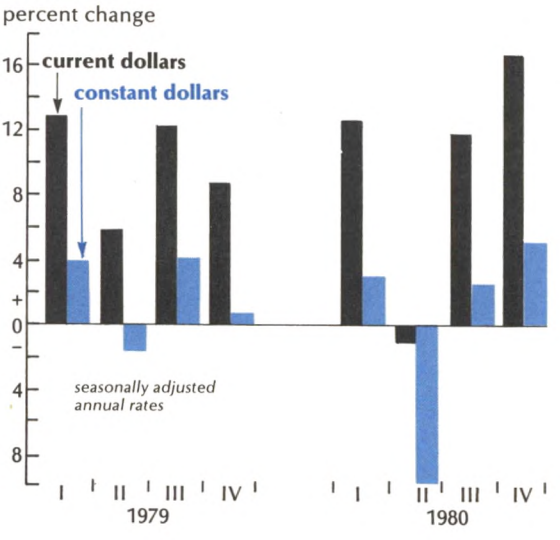
1980 reviewed

Since the spring of 1979, fears that the nation would slide into a deep and extended recession have been almost continuous. The common measure of the performance of the economy is the gross national product adjusted for inflation (real GNP). Perhaps never before has this measure performed as erratically.

Real GNP dipped at an annual rate of 2 percent in the second quarter of 1979, primarily because of oil stringencies resulting from the Iran shutoff. However, this decline was more than offset by a rise in the third quarter of that year, and modest gains continued into early 1980.

In March and April of 1980, severe credit restraint programs adopted by lenders followed the evocation of the Credit Control Act by the President and its implementation by the Federal Reserve. With the economy on an uneasy plateau, the effect of further abrupt tightening of credit was immediate. New orders were slashed in virtually all industries as managers tried to reduce inventories. New mortgage commitments dried up. In the second quarter of 1980, real GNP dropped at a 10 percent annual rate. The Federal Reserve's industrial production index dropped 8 percent from March to July, and payroll employment declined by 1.3 million.

In the late spring of 1980, many professional forecasters thought that the decline in activity would continue through 1980 and perhaps into the new year. However, as credit eased in the summer, most activities revived. Real GNP rose slowly in the third quarter and at an accelerated pace in the fourth quarter, but failed to regain the first-quarter high. From July to December industrial production



rose 7 percent, and payroll employment regained the March level, despite a lag in manufacturing employment.

For 1980 as a whole, real GNP just equaled 1979, after a 3 percent rise in 1979. In the last recession real GNP had declined 1 percent in two successive years, 1974 and 1975. Industrial production declined 3.6 percent last year, much less than the 9 percent drop in 1975. Payroll employment averaged 800,000 *higher* in 1980, compared with a 1.3 million *decline* in 1975. Housing starts at 1.3 million were down 36 percent from the recent cyclical high of 1978. From 1972 to 1975 housing starts had dropped by a half.

Inventories kept in line

Why did the economy right itself and start growing again after the one-quarter declines of 1979 and 1980? Historically, general business declines usually gather momentum and continue for two to four quarters. Large gains in personal income helped by government transfer payments, and rapid growth in other budget outlays provide part of the answer. Perhaps of greater importance was the fact that no classic inventory cycle developed. In each of the business recessions since World War II, the shift from inventory accumulation to liquidation played a major role.

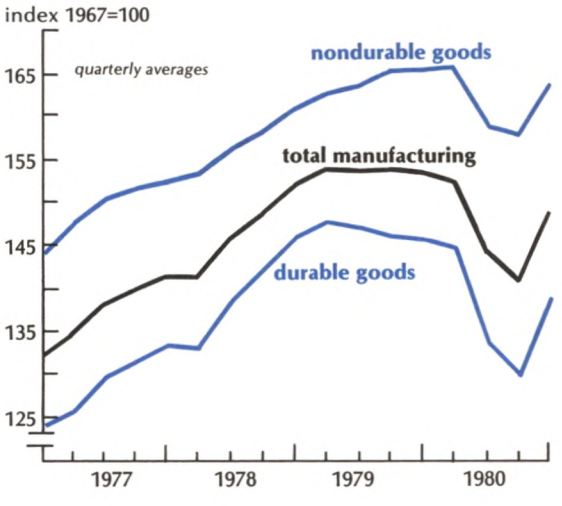
In 1979 and 1980 most business managers had kept inventories lean. Lead times on new orders remained short as "hand-to-mouth" buying was the rule. With final demand maintained at high levels, decisions to reduce stocks further were self-limiting, assuming businesses wanted to maintain satisfied customers.

In 1975 nonfarm inventories, adjusted for inflation, declined by $8 billion after a rise of $12 billion in 1974. The change from inventory accumulation to liquidation between these two years amounted to $20 billion and exceeded the $14 billion decline in real GNP. In contrast, inventories declined by less than $1 billion in 1980, following a rise of $8 billion in 1979. The impact on total output was only half as great as in 1975.

Business managers always try to keep inventories as low as is consistent with maximizing profits. Interest expense, along with rent, taxes, and insurance, is one of the reasons. In the 1950s and 1960s, when money could be borrowed at about 6 percent, interest cost was not a critical factor in inventory management for most firms. Interest is tax deductible, and the moderate inflation of those years meant that interest cost might be offset by appreciation in the value of the inventory. In 1979 and 1980 the prime rate was never under 11 percent and in some periods in 1980 exceeded 20 percent, levels undreamed of in earlier decades. Moreover, floating rates on bank loans meant that rates could be raised while items remained in stock. Such interest costs made it imperative to keep stocks at an irreducible minimum even at the risk of losing sales. Firms with surplus cash to invest also found it profitable to hold down inventories to increase short-term investments at high rates.

Another factor that kept inventories low during the expansion of 1975-80 was a desire not to repeat the experience of the last recession. In 1973-74 widespread shortages, aggravated by price controls on materials and components, caused many firms to lay in

Manufacturing output recovered in late 1980



extra supplies for precautionary reasons. The sharp drop in activity in the fourth quarter of 1974 led to widespread order cancellations with resultant production cutbacks and adverse effects on profits. No such rash of cancellations accompanied the short-lived recessions of 1979 and 1980.

Various industries, including steel, nonferrous metals, paperboard, motor vehicles, and household appliances, experienced one or more inventory cycles of their own in 1979-80. Cutbacks in output were limited by the need for distributors and retailers to restock after moderate liquidations.

Customers slow payments

In 1980 complaints by businesses, large and small, that collections on receivables had slowed were probably more frequent than at any time since the early 1930s. The Credit Research Foundation reported that outstanding receivables of manufacturers averaged 45 days' sales, and receivables of wholesalers averaged 43 days, up from 41 and 38 days, respectively, in 1977. Delinquencies and bad debts also increased. A slowing in collections tends to cumulate because payments often are dependent upon timely collection of receivables from others. In many cases past-due receivables reflected serious financial problems of companies whose very existence was threatened. More frequently, however, firms slowed payments wherever possible to avoid increasing borrowings at high rates. Other firms with large cash reserves held back on payments in order to increase earnings on short-term investments.

Some sellers of goods and services reacted to the tendency for customers to stretch out payments by refusing to ship, or render additional services, until payments were updated. Some resorted to COD (cash on delivery) shipments, requiring that truck drivers have certified checks in hand before unloading their vans. Credit investigations and criteria became more exacting.

Restraints on trade credit, like hand-to-mouth inventory buying, tend to hold down general business activity. However, such restraint also reduces the likelihood of a classic boom and bust resulting from unbridled credit expansion.

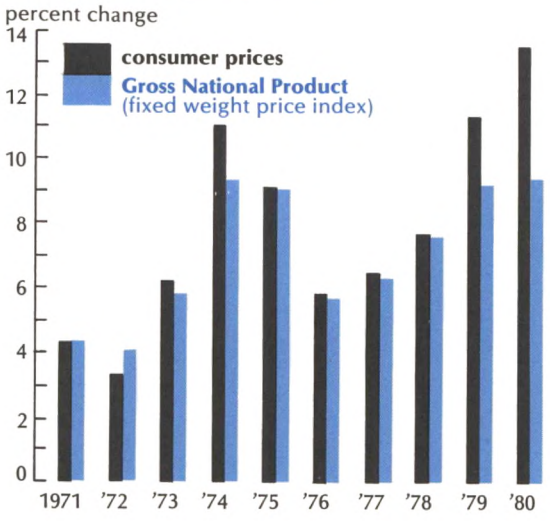
Capital spending trimmed

In the years 1977-79, business capital spending on new structures and equipment rose at an average of 17 percent annually, while nominal GNP rose at an average rate of 12 percent. In this period the ratio of capital spending to GNP rose from 10.1 percent to a record 11.6 percent. In 1980 GNP rose 9 percent, while capital spending rose 5 percent.

High interest rates, along with greater uncertainties regarding the future caused some firms to cut back on planned capital spending in 1980. This was true not only of small firms lacking access to the capital markets, but also of some hard-pressed large firms. Private rating agencies responded to poor financial results by reducing credit ratings, making it more difficult to sell debt on acceptable terms. Most large companies with adequate resources went ahead with expansion plans already under way, but many postponed approvals of new projects.

Corporate bond issues in the first half of 1980 were half again as large as a year earlier, but volume dropped in the second half as

Consumer price index has out-paced the general price level



interest rates rose sharply. New high-grade corporate bonds yielded about 9.5 percent in most of 1979, high by past standards but manageable. Last year the rate moved to the 13 percent range in the early spring, turned down in the summer, and then set new highs in the 14-15 percent range in December. Many corporate treasurers refused to sell bonds at these rates. A huge backlog of issues was said to be building up to be offered if rates dropped to 12 percent or less.

Nonresidential construction projects are commonly financed with mortgages purchased by insurance companies and other institutions. Commitments are usually made well in advance of actual construction. Thus, construction activity can continue at a high level for months after commitments have been cut back. Such a cutback occurred in the summer of 1980. Some insurance companies, worried about withdrawals of funds by policyholders, halted all commitments despite yields of 15 percent or more available on high-grade mortgages.

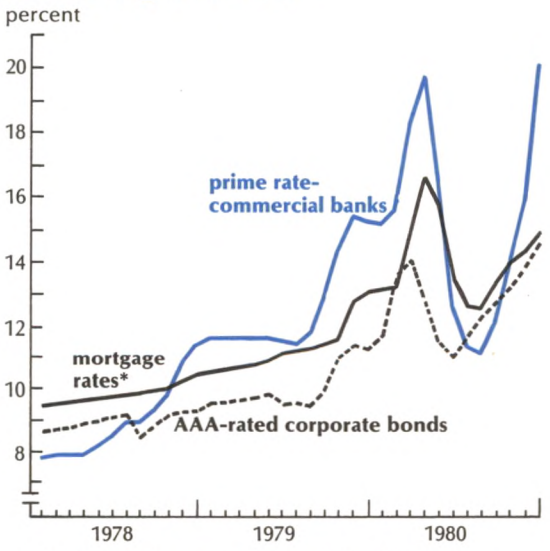
Much capital equipment is financed on instalment loans similar to consumer credit. Examples are construction equipment, agricultural equipment, heavy trucks, and trailers. The upsurge in interest rates in 1980 caused many dealers to reduce orders to manufacturers because of floor planning costs. Many buyers were deterred by heavy monthly payments necessitated by rates in the 18-20 percent range or failed to meet stricter credit criteria.

Autos and trucks nosedive

Sales of domestic autos dropped to 6.6 million in 1980, 30 percent below 1978, the best recent year and the lowest since 1961. Sales of imports at 2.4 million set a new high, but even the most popular imports were meeting sales resistance late in the year. Truck sales at 2.5 million, including a half million small imports, were 40 percent below the 1978 level.

Sales of cars were at a respectable annual rate of 11 million in the first quarter of 1980. But tight money and the recession brought an abrupt decline in the second quarter and only an incomplete recovery in the second half.

Interest rates soared to record highs in 1980



*Effective commitment rates, 80% conventional loans.

Output of cars and trucks combined was only 8 million in 1980, 38 percent below the record 12.9 million total of 1978 and the lowest level since 1961. Production of steel, nonferrous metals, rubber, and glass intended for the auto industry declined even more than 38 percent because of the smaller average size of vehicles. In a related development, production of recreational vehicles in 1980 was 76 percent below 1978.

Employment in the motor vehicle industry dropped from over a million in early 1979 to 730,000 last May. Indefinite layoffs totaled 250,000 at one point last summer, and they remained at over 180,000 late in the year.

Tight credit depressed sales of autos and trucks in three ways. First, dealers' floor plan rates rose to unheard of levels of 22 percent, 24 percent, and more, causing them to order fewer vehicles and pushing many of them to the wall. Second, higher rates on consumer loans increased monthly payments for instalment buyers. Third, lenders became more selective in accepting risks, and some completely stopped making auto loans.

The troubles of the motor industry cannot be blamed entirely on tight money. Prices of vehicles have risen very sharply because of liberal labor contracts, higher materials prices, and costs of complying with government regulations. Meanwhile, the Japanese have been offering cars and trucks that many Americans have found to be more suitable than domestic products. Finally, soaring gasoline prices have reduced driving and cars are lasting longer.

Housing slumps

Last year construction was started on 1.3 million housing units nationally (860,000 homes and 450,000 apartments), down from 1.7 million in 1979 and 2 million in 1978. From 1978 to 1980 total starts dropped 34 percent, homes by 40 percent, and apartments by 23 percent. The decline for apartments was softened by increased federal funds for subsidized projects and by strong demand for condominiums in some areas.

The Midwest was affected much more than the nation by the housing slump. Data compiled by Bell Federal Savings for the Chicago area show that permits for new housing units totaled only 13,000 in 1980, down 74 percent from 50,000 in the best year, 1977, with homes off 82 percent and apartments off 59 percent. Reports from other large Midwest centers were almost as bad, and some smaller communities reported no activity at all.

Part of the Chicago area's problem is outmigration. The central city had been losing population in the 1950s and 1960s, but in the 1970s the population of the whole metropolitan area stabilized. Loss of population, in part, reflects loss of jobs. Nevertheless, the drop in housing construction would have been much less severe if credit had remained as available as before.

Conventional mortgage rates pierced the 10 percent level in 1978. Last spring, and again late in 1980, rates were quoted in the 15 percent to 17 percent range. However, virtually no loans were made at these high rates. Loans closed were largely based on commitments made months earlier or represented "creative financing" balloon notes, short-term rollover mortgages, and other innovations. Analysts contend that a viable conventional mortgage market must await a drop in mortgage rates to the 11-13 percent range.

As in the case of autos, home sales have been depressed by rapidly rising prices. Since 1974 the median price of homes has doubled, reflecting rising costs of labor, materials, and developed land. Higher prices combined with higher interest rates priced many potential buyers out of the market.

The financial picture in housing is complicated by the fact that rising interest rates have placed S&Ls, the principal mortgage lenders, under growing financial pressures. Many S&Ls have reported net outflows of savings as depositors have shifted to high-yielding money market instruments. Attempts to counter this outflow by offering money market certificates tied to six-month Treasury bill rates have caused some major S&Ls to suffer operating losses for the first time in their history.

Hope for improvement

Early in 1981 the economy was showing surprising strength. Employment rose again in January, and some large retailers reported a favorable level of sales. Motor vehicles and housing remained seriously depressed, with the Midwest still shouldering a disproportionate share of the burden.

Credit restraint and high interest rates are intimately related to the rapid pace of price inflation. Ready availability of credit under standard contracts at affordable rates provided the underpinnings for the great expansion of the housing and motor vehicle industries after World War II. If inflation cannot be reduced well below the two-digit pace and interest rate volatility cannot be reduced, the whole structure of financing home and vehicle purchases must be modified to protect both borrowers and lenders.

Interest rate volatility in 1980

Paul L. Kasriel

Interest rates displayed extreme volatility in 1980, reaching record highs in early spring, then plummeting until midsummer, only to rise above their previous peaks by late fall. Interest rates were more variable not only in a cyclical sense, but also in their weekly and daily behavior. It is unlikely that any single factor was responsible for the volatile behavior of interest rates in the past year, as rates are subject to myriad influences. These include changing inflationary expectations, exogenous commodity-specific supply shocks, fiscal and monetary policy actions, and national and international political developments.

Although these or similar factors are present to some degree every year, one of them—monetary policy—underwent a profound change just prior to 1980 that undoubtedly had important effects on rates during the year. On October 6, 1979, the Federal Reserve announced a new operating procedure that placed "greater emphasis in day-to-day operations on the supply of bank reserves and less emphasis on confining short-term fluctuations in the federal funds rate." As later explained, the reason for the change in operating procedure

> was to underscore, in terms of public perception and debate, the central importance of maintaining control over monetary growth and bank reserves to deal with inflation, and to better discipline . . . [Federal Reserve] internal policy-making with respect to monetary and credit growth, thus enhancing . . . [the Federal Reserve's] ability to achieve . . . [its] objectives.[1]

This article examines some of the implications of the new operating procedure with respect to the variability of interest rates and discusses the economic costs of interest rate variability.

Old vs. new operating procedures

From 1970 through October 6, 1979, the Federal Open Market Committee (FOMC) generally attempted to achieve its economic goals by specifying a federal funds rate trading range for the period between FOMC meetings (usually one month) thought consistent with these goals.[2] Although, as the decade progressed, more and more attention was focused on achieving specified growth rates in a family of monetary aggregates as intermediate targets of policy, the immediate operating target remained the federal funds rate. Each week within the intermeeting period, a federal funds rate target was chosen by a representative of the FOMC in consultation with staff members of the Board of Governors and the Trading Desk of the Federal Reserve Bank of New York (Desk).

Shifts in the demand for nonborrowed reserves within the statement week would be accommodated by the Desk in order to maintain the targeted federal funds rate. Similarly, changes in nonborrowed reserves caused by unexpected changes in so-called "market factors," such as Federal Reserve float, tended to be offset by Desk open market operations if they caused the federal funds rate to deviate from its targeted level. This federal

[1]Paul A. Volcker, Chairman, Board of Governors of the Federal Reserve System, "Supplementary Statement—The New Operating Procedures," before the Subcommittee on Domestic Monetary Policy of the Committee on Banking, Finance and Urban Affairs, House of Representatives, November 19, 1980, p. 1; processed.

[2]For a discussion of pre-October 6, 1979, Federal Reserve monetary policy operating procedures, see Peter Keir and Henry Wallich, "The Role of Operating Guides in U.S. Monetary Policy: A Historical Review," *Federal Reserve Bulletin*, vol. 65 (September 1979), pp. 679-691, and Raymond E. Lombra and Raymond G. Torto, "The Strategy of Monetary Policy," *Economic Review*, Federal Reserve Bank of Richmond (September/October 1975), pp. 3-14.

funds rate targeting strategy was tantamount to the provision of a perfectly elastic supply of nonborrowed reserves at a given federal funds rate until the afternoon of the last day of the reserve settlement week.[3]

Each Friday morning the FOMC received new projections of monetary growth rates and could then choose a new weekly federal funds rate target thought appropriate for achieving its goals. Thus, under the old operating procedure in effect prior to October 6, 1979, daily variation in the federal funds rate was minimal. But because it was largely the direct result of a policy decision, weekly variation could have been about whatever the FOMC desired.

Under the new operating procedure adopted October 6, 1979, the FOMC continues to set intermediate-term (two- or three-month) growth targets for the monetary aggregates. Now, however, the specified intermeeting federal funds rate trading range is typically much wider than under the old operating procedure.[4] The Federal Reserve Board staff determines an average level of nonborrowed reserves over the intermeeting period thought to be consistent with the FOMC's desired growth in the monetary aggregates. The Desk is then directed to attempt to hit a weekly average level of nonborrowed reserves with relatively little regard for the level of the federal funds rate unless the boundaries of the intermeeting trading range are in danger of being violated. In contrast to the old operating procedure, the new procedure does not accommodate shifts in banks' demand for nonborrowed reserves within the reserve settlement week. Moreover, because daily federal funds rate control has been deemphasized, the Desk is less likely to take immediate action to offset undesired daily movements in nonborrowed reserves—and, thus, in the federal funds rate—caused by unexpected changes in reserve market factors.

In light of the new projections of monetary growth rates usually available on Friday mornings, a decision is made as to how to distribute nonborrowed reserves on a weekly average basis over the remaining weeks of the policy period so as to achieve the FOMC's intermeeting average level objective. Occasionally, it is decided to change the intermeeting average level objective.[5] For a given level of the Federal Reserve discount rate and a given relationship between the level of borrowing from the Fed and the nonpecuniary costs associated with that borrowing, the federal funds rate will rise (fall) if the specified level of nonborrowed reserves implies a higher (lower) level of borrowed reserves.[6] Under the new operating procedure, weekly changes in the federal funds rate tend to be more automatic, whereas they were more discretionary or policy-determined before. For example, if the monetary aggregates were growing faster than the FOMC desired, then,

---

[3]After 1 P.M., New York time, it becomes increasingly impractical for the Desk to buy or sell U.S. government securities for same-day delivery and, thus, to affect reserves on that day. Since Wednesday is the last day of the reserve settlement week for depository institutions subject to reserve requirements, the supply of nonborrowed reserves becomes, for all intents and purposes, perfectly inelastic after 1 P.M. on Wednesdays, and the federal funds rate rises or falls to clear the market.

[4]From October 1978 through September 1979, the average specified intermeeting federal funds rate range was 0.62 percentage points in contrast to 5.45 percentage points from October 1979 through September 1980.

[5]For a discussion of the mechanics of the nonborrowed reserves targeting procedure, see Steven H. Axilrod and David E. Lindsey, "Federal Reserve System Implementation of Monetary Policy: Analytical Foundations of the New Approach" (paper presented at the Denver meeting of the American Economic Association, September 6, 1980; processed); Board of Governors of the Federal Reserve System, "Appendix B: Description of the New Procedures for Controlling Money" (appended to "Monetary Policy Report to Congress Pursuant to the Full Employment and Balanced Growth Act of 1978," February 19, 1980; processed); Warren L. Coats, Jr., "Recent Monetary Policy Strategies in the United States" (unpublished paper, August 8, 1980; processed); and "Monetary Policy and Open Market Operations in 1979," *Quarterly Review*, Federal Reserve Bank of New York, vol. 5 (Summer 1980), pp. 60-62.

[6]Under lagged reserve accounting, depository institutions' required reserves in the current reserve settlement week depend on the level of their reservable liabilities two weeks prior. Assuming a constant level of excess reserves, the level of nonborrowed reserves in the current week defines the level of borrowed reserves.

presumably, required reserves would be growing faster than targeted nonborrowed reserves. As a result, borrowed reserves would rise and so too would the federal funds rate. Under the old operating procedure, the federal funds rate would rise only within the range specified at the last FOMC meeting unless the FOMC made a conscious decision to let it rise further.

In sum, then, there is a strong presumption that day-to-day variability in the federal funds rate will be greater under the new operating procedure than under the old one. Week-to-week variability in the federal funds rate might also be expected to be greater under the new operating procedure because the level of the federal funds rate, given the level of the Federal Reserve discount rate, depends critically on depository institutions' "reluctance" to borrow from the Fed, which also may be variable.

With regard to longer-run cyclical movements in the federal funds rate, it is not clear why the two procedures should yield markedly different outcomes. Under the old procedure, the level of the federal funds rate was a direct FOMC policy decision.[7] Under the new operating procedure, the level of the federal funds rate is indirectly determined by policy decisions, in that it depends on the targeted path of nonborrowed reserves, the level of the discount rate, and the nonpecuniary costs associated with borrowing from the Fed.

Federal funds rate variability

As the graph and table make clear, the federal funds rate has indeed shown greater day-to-day and week-to-week variability in the year since October 6, 1979, compared with the year before. As already discussed, one of the reasons for this greater variability is that under the new procedure, shifts in banks' demand for nonborrowed reserves within the reserve settlement week are not accommodated by Desk open market operations. Moreover, it could be expected that these intraweek demand shifts would be more volatile in the post-October 6 period.

Under the old procedure when the federal funds rate was being targeted within narrow bands on a weekly basis, banks had little incentive to increase or decrease their federal funds purchases or sales in order to take advantage of a higher or lower federal funds rate on any particular day. If the federal funds rate moved above (below) the perceived upper (lower) limit of the FOMC's targeted range, then bidding (offering) would subside as market participants expected the federal funds rate to fall (rise) either on its own accord or as a result of Desk open market operations.

[7]For discussions of why the federal funds rate was not moved by greater amounts under the pre-October 6 operating procedure, see John P. Judd and John L. Scadding, "Conducting Effective Monetary Policy: The Role of Operating Instruments," *Economic Review*, Federal Reserve Bank of San Francisco (Fall 1979), pp. 29-30; Thomas A. Lawler, "Fed May be Shifting to a True Reserves-Targeting Policy," *The Money Manager*, December 8, 1980, pp.8, 11; Paul A. Volcker, op. cit., pp. 1-2, 5,6; and Henry C. Wallich, Member, Board of Governors of the Federal Reserve System, "Federal Reserve Policy and the Economic Outlook" (remarks to the Chesapeake Chapter of Robert Morris Associates, Bethesda, Maryland, December 3, 1980, pp. 2,8; processed).

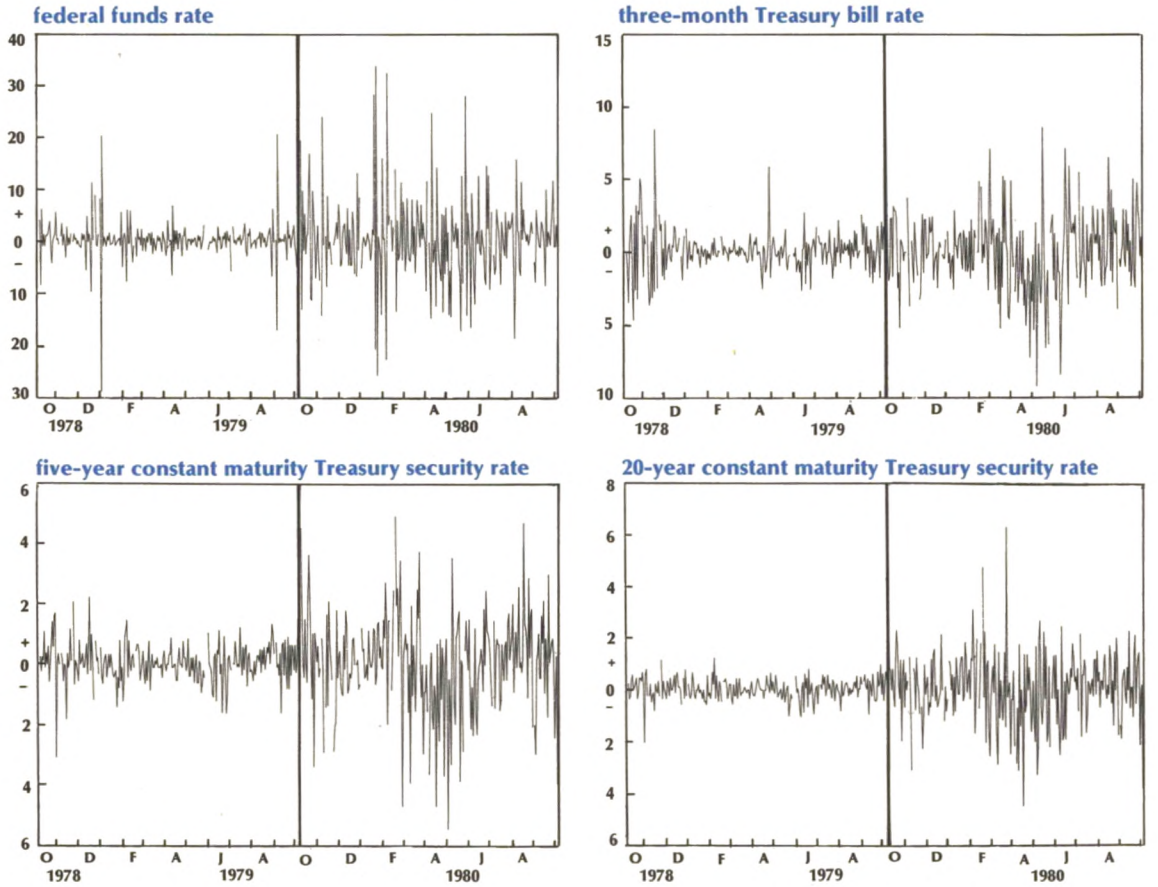
Standard deviations of percentage changes of selected interest rates

	October 1978-October 1979 (percent)	October 1979-October 1980 (percent)
Federal funds rate		
Daily	3.672	8.118
Weekly averages*	2.061	3.154
Three-month Treasury bill rate		
Daily	1.425	2.612
Weekly averages**	0.731	1.353
Five-year constant maturity Treasury security rate		
Daily	0.630	1.580
Weekly averages**	0.319	0.845
20-year constant maturity Treasury security rate		
Daily	0.398	1.357
Weekly averages**	0.201	0.647

*Seven-day averages of daily effective rates for the week ending Wednesday.

**Five-day averages of daily closing bid rates for the week ending Friday.

Daily percentage changes in selected interest rates



Since October 6, however, the weekly federal funds rate trading range tolerated by the FOMC has widened significantly. As a result, depository institutions may enjoy large gains or suffer large losses depending on the accuracy of their intraweek federal funds rate forecasts.[8] If the federal funds rate starts to rise, depository institutions no longer have the assurance they once did that the rate will fall later in the settlement week. Given greater uncertainty as to the level of the federal funds rate later in the day or settlement week, bidding may continue, forcing the rate even higher. Conversely, a falling federal funds rate might not result in the withdrawal of offers to sell federal funds.

Even if there were no change in depository institutions' intraweek demand for nonborrowed reserves under the new operating procedure, greater day-to-day volatility in the federal funds rate could be expected due to changes in nonborrowed reserves resulting from movements in uncontrollable reserve market factors that were unanticipated by the Fed. Under the old procedure, the Desk had good reason to believe that the demand for

[8]Because of lagged reserve accounting, depository institutions know, entering the reserve-settlement week, the weekly average level of reserves they must hold to avoid a deficiency. Their decision is how to distribute their reserve holdings within the week in order to meet their known reserve requirements at minimum cost.

Economic events in 1980—a chronology

Jan 1 Minimum wage rises from $2.90 to $3.10. (It goes to $3.35 on January 1, 1981.)

Jan 1 Social Security wage base rises from $22,900 to $25,900. Tax rate stays at 6.13 percent. (On January 1, 1981, base rises to $29,700, and tax rate to 6.65 percent.)

Jan 1 Regulatory authorities replace four-year floating rate CD (established July 1, 1979) with 2½-year "small saver" CD.

Jan 1 Treasury Department starts issuing double-E bonds yielding 7 percent over 11 years.

Jan 4 President Carter denounces Russian invasion of Afghanistan. He embargoes shipments of agricultural products to Russia.

Jan 23 State of Union message calls for draft registration and 5 percent boost in real defense spending.

Jan 28 Saudi Arabia raises its basic oil price to $26.

Feb 1 Trade agreement between the U.S. and the Peoples Republic of China goes into effect.

Feb 6 IMF auctions 444,000 ounces of gold at $712 per ounce, up from record $563 on January 2.

Feb 7 Federal Reserve Board announces new monetary aggregate definitions: M-1A is old M-1 but excludes demand deposits held by foreign banks and institutions. M-1B adds other checkable deposits, including NOW and ATS accounts. M-2 adds savings and small time accounts at banks and thrifts, overnight RPs and Eurodollars, and money market funds. M-3 adds large CDs and other RPs. L (for "liquidity") adds savings bonds, short-term Treasuries, other Eurodollars, commercial paper, and bankers' acceptances.

Feb 14 Chicago firemen go on strike. (They return to work March 8.)

Feb 15 Algeria boosts oil price $3.00 per barrel to $37.21.

Feb 15 Federal Reserve raises discount rate from 12 percent to a record 13 percent.

Feb 18 In Canada Trudeau's Liberals defeat Joe Clark's Conservatives ending nine-month government.

Feb 19 Federal Reserve announces money and credit growth targets for 1980: M-1A, 3½-6 percent; M-1B, 4-6½ percent; M-2, 6-9 percent; M-3, 6½-9½ percent; total bank credit, 6-9 percent.

Feb 27 One-year Treasury bills sell at 15.3 percent bond-equivalent yield, highest ever for any U.S. security.

Feb 28 Nuclear Regulatory Commission lifts moratorium on new nuclear plants imposed after Three Mile Island accident.

Mar 1 Regulatory authorities impose temporary ceilings on "small saver" CDs, 11¾ percent for banks, 12 percent for thrifts.

Mar 12 Chicago bank raises its mortgage rate to 16.25 percent.

Mar 13 President Carter endorses 7.5-9.5 percent wage rise guidelines for 1980, up from 7 percent in 1979.

Mar 14 President Carter announces new anti-inflation program, and activates Credit Control Act of 1969.

Mar 14 Federal Reserve Board announces 15 percent "special deposit" on growth of money market funds and some types of consumer credit, a voluntary "Special Credit Restraint Program" to restrict business credit, an increase in marginal reserves on managed liabilities from 8 to 10 percent, and a 3-point "surcharge" on frequent borrowings from Federal Reserve by large banks. Banks are urged to limit loan growth to 6 to 9 percent.

Mar 21 Administration suspends "trigger price mechanism" intended to curb steel imports. (Mechanism is reinstated October 21.)

Mar 23 Rock Island Railroad ceases operations.

Mar 24 Bond-equivalent yield on three-month Treasury bills jumps sharply to 17.5 percent.

Mar 25 Large Chicago S&L increases mortgage rate to 17 percent.

Mar 27 Spot price of silver drops $5 to $10.80 per ounce. (Peak of $50 was reached in January.)

Mar 29 FmHA's Economic Emergency Loan Program to aid financially distressed farmers is extended and expanded.

Mar 31 Depository Institutions Deregulation and Monetary Control Act (Monetary Control Act) is approved. Among its many provisions: all depository institutions, member and nonmember, will be phased in to the same new reserve requirements over a period of years; Federal Reserve member banks can no longer avoid reserve requirements by withdrawing from the system; all institutions will have full access to the Federal Reserve's discount window and services; Federal Reserve will establish a pricing schedule for its services; all institutions will be able to offer NOW accounts beginning December 31, 1980; interest rate ceilings on savings and time deposits will be phased out in six years; thrift institutions will have expanded asset powers; state usury ceilings for mortgages and certain other loans are overridden; FDIC/FSLIC insurance limits are boosted from $40,000 to $100,000.

Apr 2 Major bank boosts prime rate to 20 percent.

Apr 2 Act imposing "windfall profits" (excise) tax on domestic crude oil output is approved. Tax is retroactive to March 1.

Apr 7 U.S. breaks diplomatic relations with Iran, and cuts off all trade.

Apr 16 Major bank cuts its prime rate from 20 to 19.75 percent.

Apr 17 Federal Reserve Board extends seasonal borrowing privilege to small nonmember banks.

Apr 17 China replaces Taiwan as a member of the International Monetary Fund.

Apr 20 International Harvester workers end longest United Automobile Workers strike after 172 days.

Apr 21 Dow Jones industrial average closes at 759, low for the year. (See **Nov 20**.)

Apr 25 President Carter announces failure of airborne attempt to rescue U.S. hostages held in Iran.

Apr 28 Secretary of State Vance is succeeded by Senator Muskie.

May 4 U.S. stops granting visas to Cuban refugees.

May 7 Federal Reserve eliminates 3 percent surcharge on frequent borrowings by large banks.

May 14 Saudi Arabia raises its basic oil price from $26 to $28.

May 17 Unemployment compensation claims reach a new high.

May 18 Mt. St. Helens erupts violently causing extensive damage.

May 18 National Guard moves to control rioting in Miami.

May 22 National Association of Purchasing Agents survey shows business "dropped like a rock" in April and May.

May 22 Federal Reserve eases credit restraint program.

May 27 Lyle Gramley joins Federal Reserve Board.

May 29 Federal Reserve reduces discount rate from 13 to 12 percent.

May 30 Aluminum workers win 42 percent boost over three years, assuming 11 percent inflation rate.

Jun 13 Federal Reserve reduces discount rate from 12 to 11 percent.

Jun 13 Many banks reduce prime rate to 12 percent.

Jun 24 Chrysler obtains $500 million loan after government board approves federal guarantee.

Jun 30 Synfuel act creates Synthetic Fuel Corporation.

Jun 30 Punishing heat wave hits the Southwest.

Jul 1 Checks to 35.2 million Social Security recipients rise 14.3 percent based on Cost of Living Adjustment (COLA) formula.

Jul 1 Motor Carrier Reform Act partially deregulates trucking.

Jul 1 Department of Labor reports white-collar salaries rose 9.1 percent on average in 12 months ending in March.

Jul 3 Federal Reserve Board announces complete phaseout of credit restraint program.

Jul 3 Federal Home Loan Bank Board authorizes S&Ls to issue credit cards and offer unsecured loans.

Jul 7 Indefinite layoffs at Big Four auto makers hit a record 246,000.

Jul 12 Detroit city workers settle 11-day strike that had halted buses and garbage pickups on eve of GOP convention.

Jul 15 Secretary of Labor Marshall bars Firestone from government contracts because of job bias charges.

Jul 16 Republicans nominate Reagan and Bush.

Jul 21 Major bank cuts prime rate from 11.5 to 11 percent.

Jul 27 The Shah of Iran dies in Cairo.

Jul 28 Federal Reserve reduces discount rate from 11 to 10 percent.

Jul 28 Chrysler begins assembly of new K-cars.

Jul 29 Chairman Volcker's letter to Congress states that money growth targets for 1981 are ½ percentage points under 1980 targets for M-1A, M-1B, and M-2, but warns that precise numerical targets may confuse rather than clarify.

Aug 11 AT&T three-year labor contract gives 34.5 percent pay boost over three years, assuming 9.5 percent rise in CPI.

Aug 13 Democrats renominate Carter and Mondale.

Aug 17 Polish factory workers strike demanding pay hike, shorter week, more food, free speech, and free church.

Aug 18 Ford begins assembly of its new small "Erika" cars.

Aug 21 Import duty on small trucks rises from 4 to 25 percent.

Aug 22 Major banks boost prime rate to 11.25 percent, first of a series of increases.

Aug 28 Federal Reserve publishes proposed pricing schedule and pricing principles for its services.

Sep 1 Revised Regulation A, as required by Monetary Control Act, gives all depository institutions access to the discount window.

Sep 12 Military coup seizes power in Turkey.

Sep 17 Saudi Arabia boosts its oil price $2 to $30 per bbl.

Sep 22 Iran-Iraq war begins over disputed border waterway.

Sep 26 Federal Reserve raises discount rate from 10 to 11 percent. Major banks boost prime rate to 13 percent.

Sep 29 Bond-equivalent yield on three-month Treasury bills jumps a full point to 12 percent.

Oct 1 Federal employees receive a 9.1 percent general pay boost, in addition to annual step increases.

Oct 2 Major bank leads boost in prime rate to 14 percent.

Oct 9 Regulatory authorities set 5¼ percent ceiling on NOW accounts, effective December 31.

Oct 14 Staggers Rail Act provides for gradual deregulation.

Oct 14 Lawrence Klein wins Nobel prize in economics.

Oct 20 Agriculture Department announces that drought cut major crops—peanuts, 37 percent; soybeans, 23 percent; corn, 17 percent.

Oct 22 Agriculture Department announces four-year agreement committing China to substantial purchases of wheat and corn.

Nov 4 Spot oil prices on world market increase to $37-40 range, $6-9 over official prices.

Nov 4 Reagan wins the Presidency. GOP wins control of the Senate, and makes gains in the House.

Nov 6 Major banks raise prime rate from 14.5 to 15.5 percent.

Nov 9 Major steel company reopens strip mill closed last May.

Nov 10 International Trade Commission turns down request by Ford and UAW for quotas on imports of cars and light trucks.

Nov 13 First phase of reserve requirement provisions of Monetary Control Act becomes effective.

Nov 13 Copper producers settle record 19-week strike. Pact calls for 39 percent boost over three years, assuming 11 percent COLA.

Nov 17 Federal Reserve raises discount rate from 11 to 12 percent, with 2 points added for $500 million institutions that borrow frequently.

Nov 20 Governor Thompson of Illinois orders 60-day hiring freeze.

Nov 20 The Dow Jones index closes at 1000, high for the year. (See **Apr 21**.)

Nov 24 New York legislature eliminates usury ceilings on most loans.

Dec 5 Federal Reserve raises discount rate to 13 percent, equaling high of last spring, and raises surcharge to 3 percent.

Dec 10 Auto makers extend holiday closings to cut inventories.

Dec 10 Major banks raise prime rate from 19 to 20 percent.

Dec 15 Bond-equivalent yield on three-month Treasury bills hits 17.64 percent, passing 17.5 percent high on March 24, 1980.

Dec 15 Saudi Arabia raises its basic oil price from $30 to $32. Maximum OPEC price will be $41.

Dec 16 Council on Wage and Price Stability decides not to issue new price and wage standards, effectively ending its career.

Dec 16 American Motors Corporation stockholders vote to allow Renault to acquire control.

Dec 19 Most major banks raise prime rate to record 21.5 percent.

Dec 21 Iran demands $24 billion ransom to release hostages.

Dec 22 Major banks reduce prime rate from 21 to 20.5 percent.

Dec 22 Yields on Treasury bills drop sharply.

Dec 23 Labor Department announces that November Consumer Price Index was 12.7 percent above the level of a year earlier.

Dec 26 Retailers report strong pre-Chrsitmas sales.

Dec 29 Libya raises its oil price from $37 to $41, OPEC maximum.

Dec 30 Agriculture Department calls Commodity Credit Corporation loans on all corn in reserve program.

Dec 31 Major S&L says high interest rates have virtually shut down Chicago area residential real estate markets.

nonborrowed reserves on a day-to-day basis within the settlement week was relatively stable. Consequently, a movement of the federal funds rate outside its targeted range was a warning that the supply of nonborrowed reserves might be something other than what the Fed had forecast.[9] The Desk often undertook "defensive" open market operations based on the deviation of the actual level of the federal funds rate from its expected level. Since October 6, however, the daily federal funds rate has provided the Desk with less information about the actual level of nonborrowed reserves because changes in the rate may reflect not only changes in the supply of nonborrowed reserves, but also shifts in the demand for them.

Variability in longer-term rates

Although increased day-to-day volatility in the federal funds rate was expected to accompany the new operating procedure, there was more uncertainty about the response of longer-term rates to the increased volatility of one-day rates. The relationship between interest rates and the maturity of securities is known as the term structure of interest rates. Although there are variants on the theme, most theories of the term structure posit that expectations about the future level of short-term rates play a major role in the determination of longer-term rates.[10] For example, according to the pure expectations theory, the current 90-day Treasury bill rate is a geometric average of 90 expected future one-day Treasury bill rates. The degree to which greater variability in the federal funds rate, a one-day rate, will lead to greater variability in longer-term rates depends on the degree to which daily changes in the federal funds rate affect expectations of future daily federal funds rates.

It has been argued that under the old operating procedure, short-term movements in the federal funds rate contained more information about future movements in this rate because the FOMC was targeting its level within narrow bands. Thus, it was believed that short-term movements in the federal funds rate had significant effects on expectations and were quickly translated into movements of longer-term rates. Because short-term movements in the federal funds rate under the new operating procedure contain less information about policy intentions, such movements are likely to have less of an effect on expected future federal funds rates. Thus, the response of longer-term rates to short-term movements in the federal funds rate might be diminished under the new operating procedure.[11]

The first part of this argument may have some empirical validity. That is, movements in the federal funds rate since October 6, 1979, appear to have conveyed less information about its future movements than before in as much as the correlation coefficient between daily percentage changes in the federal funds rate on the current and preceding day decreased from -0.51 in the year preceding October 6, 1979, to -0.34 in the year after.[12] Despite this, as shown in the graphs and table, the variability of longer-term rates, as represented by the three-month Treasury bill rate and the five-year and 20-year constant maturity Treasury securities rates, increased in the year following October 1979, compared with the year before. Moreover, the correlation between daily percentage

[9]In the pre-October 6 period, the Fed also made daily reserve projections and had some intuition as to the rate level at which federal funds would trade, given required reserves and the level of the discount rate.

[10]For a discussion of different theories of the term structure of interest rates, see Burton G. Malkiel, *The Term Structure of Interest Rates* (Princeton University Press, 1966).

[11]See Judd and Scadding, op. cit., pp. 30-31; and Raymond Lombra and Frederick Struble, "Monetary Aggregate Targets and the Volatility of Interest Rates: A Taxonomic Discussion," *Journal of Money, Credit, and Banking*, vol. 2 (August 1979), pp. 290-291.

[12]Correlations using weekly average percentage changes in the federal funds rate tell a different story. The correlation coefficients between the current week and the previous week for the year prior to and the year after October 6, 1979, were -0.11 and 0.21, respectively.

changes in the federal funds rate and in the three-month Treasury bill rate and the five-year and 20-year constant maturity Treasury securities rates increased from 0.06, 0.004, and -0.04 to 0.13, 0.12, and 0.12, respectively, between the two periods.

Increased correlation coefficients, however, do not necessarily mean that longer-term rates have become more sensitive to daily movements in the federal funds rate since the new operating procedure was adopted. Given the enormous increase in the variability of the federal funds rate under the new procedure, even a diminished sensitivity could be expected to produce greater variation in longer-term rates and to increase the proportion of that variation which is explained by variation in the federal funds rate; that is precisely what a correlation coefficient measures.[13]

A more meaningful measure of the sensitivity would be the regression coefficients calculated from regressions of daily percentage changes in longer-term rates on daily percentage changes in the federal funds rate before and after the adoption of the new operating procedure. As seen in the table, the regression coefficients (b_1) have increased in size and statistical significance in the year following the adoption of the new operating procedure compared with the year before. Thus, contrary to expectations, the regression coefficients confirm the result suggested by the correlations—that longer-term rates have become more sensitive to short-term movements in the federal funds rate under the new operating procedure.

Daily % Δ Interest Rate = $b_0 + b_1$ Daily % Δ Federal Funds Rate + e

	October 1978-October 1979		October 1979-October 1980	
Dependent Variable	b_0	b_1	b_0	b_1
Three-month Treasury bill rate	0.1135	0.0254	0.0063	0.0409*
	(1.25)	(1.03)	(0.04)	(2.01)
Five-year constant maturity Treasury security rate	0.0602	0.0008	0.0502	0.0228**
	(1.50)	(0.07)	(0.50)	(1.85)
20-year constant maturity Treasury security rate	0.0381	-0.0044	0.0660	0.0202**
	(1.50)	(-0.64)	(0.77)	(1.91)

T-statistics in parentheses.
*Statistically significant at the 0.05 level.
**Statistically significant at the 0.10 level.

Together with the marked increase in the volatility of all maturities of interest rates immediately after October 6, 1979, and its continuation throughout 1980, these results constitute suggestive but not conclusive evidence that the new operating procedure has been primarily responsible for the increased variability in longer-term rates. As mentioned at the outset, since the adoption of the new operating procedure, the financial markets have been subjected to a number of extraordinary events including dangerous turmoil in the Middle East, sharp increases in energy prices, uncertainties with respect to the federal budget, the temporary imposition of credit controls, and the bursting of speculative bubbles in the commodity markets. Moreover, given the relatively short period of time that the new operating procedure has been in effect, it is reasonable to assume that market participants are still discovering its nuances and may occasionally be misinterpreting the meaning of short-run movements

[13]To illustrate this point a little more clearly, suppose that the relationship between some variable Y and some explanatory variable X were as follows:

$$Y = a + bX + e$$

where a and b are constants and e is a random disturbance term. So long as X and e are independent, the greater the variability of X, the more variable Y will be and the greater the proportion of the variability of Y that will be attributable to variation in X. But if X is held constant or nearly so (as was the case with the federal funds rate from Thursday through Tuesday under the old operating procedure) then (a + bX) will be a constant, and movements in X will account for virtually none of the total variation in Y—even though the basic relationship between Y and X, as measured by coefficient b, is unchanged. An alternative way of showing this is to look at the formula for the correlation coefficient, $r = \hat{\beta}\frac{S_X}{S_Y}$ where r is the correlation coefficient, $\hat{\beta}$ is the estimate of the coefficient b in the equation, S_X is the sample standard deviation of X, and S_Y is the sample standard deviation of Y. If S_X is very low (the variability of X is very low), r will be small regardless of the size of $\hat{\beta}$.

in the federal funds rate. As they learn more about the new procedure, some of the increased volatility may disappear.

Economic costs of interest rate variability

Most investors are risk averters. That is, the higher the risk associated with a particular investment, the higher the expected return must be to induce the investor to purchase the investment. For example, consider two investment alternatives. The first guarantees a return of $100 at the end of some specified time period. The second alternative offers possible returns of $150 and $50, each with a 50 percent probability. The expected return of the second investment is $100, the same as the first.[14] But because of the higher risk—that is, variability or uncertainty of return—associated with the second alternative, most people would prefer the no-risk or certain first investment choice. If the equally probable outcomes of the second alternative were raised to $200 and $100, so that the expected return was $150, then some investors would be induced to opt for it despite its higher risk.[15]

Because the market price or capital value of a fixed-income security varies inversely with its market yield, interest rate variability is an inherent risk of holding such a security. Assuming that the demand for a given class of fixed-income securities is dominated by risk-averse investors, an increase in the interest rate variability of these securities would lead investors to hold fewer securities at any given level of expected return. In order to induce investors to hold the same quantity as in the period of lower rate variability, the expected return must rise to reflect the higher risk.[16]

Because of their highly leveraged positions—i.e., the relatively low ratio of their capital to the value of their securities inventory—government securities dealers are particularly sensitive to interest rate variability. An unexpected sharp rise in interest rates, even of short duration, can have a profound negative impact on dealer solvency. As a result, an increase in interest rate volatility may reduce dealers' willingness to make markets in government securities, resulting in lower dealer inventories and a widening of the spread between the prices at which dealers stand ready to buy and sell securities (the bid-ask spread).[17] This hypothesized decline in the "efficiency" of the government securities market implies higher costs of marketing government debt.

A comparison of dealer bid-ask spreads on Treasury bills for the years before and after October 6, 1979, confirms that they have widened. The average spread on the current three-month Treasury bill has increased from 3.6 basis points to 6.2 basis points.[18] Similar

[14]Expected return is defined as the sum of the products of the probability of an investment outcome occurring and the value of that outcome. Thus, in the hypothetical second alternative, the expected return is equal to .5 x $50 plus .5 x $150 or $100.

[15]For a formal discussion of the effects of risk on asset demands, see James Tobin, "Liquidity Preference as Behavior Towards Risk," *Review of Economic Studies*, vol. 25 (February 1958), pp. 65-86.

[16]In a world in which there is one riskless asset and more than one risky asset and the variances of return on all of the risky assets have increased, the expected returns on *all* the risky assets need not increase unless all of them are gross substitutes for each other. Assets are gross substitutes for each other if, in response to an increase (decrease) in the price of one of them, the individual demands for all other assets increase (decrease).

[17]For theoretical analysis and empirical evidence concerning dealer behavior, see Louise Ahearn and Janice Peskin, "Market Performance as Reflected in Aggregative Indicators," *Joint Treasury-Federal Reserve Study of the Government Securities Market—Staff Studies*, part 2, pp. 93-153; Micha Astrachan, "The Costs of Interest Rate Variability," Federal Reserve Bank of New York Research Paper No. 7821, December 1977; and Burton Zwick, "Interest Rate Variability, Government Securities Dealers, and Stability in the Financial Markets," Federal Reserve Bank of New York Research Paper No. 7734, September 1977.

[18]The data used in these calculations were the first available when-issued quotes (usually Tuesday) on the most recently auctioned three-month Treasury bill. The data source was the Federal Reserve Bank of New York's closing composite quotations of U.S. government securities. It should be noted that empirical studies indicate that other factors, in addition to interest rate variability, affect bid-ask spreads. Thus, it would be imprudent to attribute the widening of bid-ask spreads in the post-October 6, 1979, period solely to increased interest rate volatility.

results obtained for the current six-month Treasury bill. However, an examination of monthly data since October 6, 1979, fails to reveal any decrease in dealer net positions in U.S. government securities as a proportion of all marketable U.S. government securities held by the public. If anything, the data show a slight increase in net deflated positions.

Increased uncertainty concerning future interest rate levels resulting from the observed increase in rate variability could also produce wider dispersions of accepted bids in Treasury securities auctions. In the weekly auctions of six-month Treasury bills, the average percentage point spread between the highest accepted bid (in terms of rates) and the lowest increased from 0.045 in the year prior to October 6, 1979, to 0.125 in the year following the adoption of the new operating procedure. Insofar as this increased bidding dispersion reflects greater investor uncertainty, and investors are risk averse, it might imply that the Treasury paid higher interest rates than it otherwise would have had to in order to compensate investors for the higher perceived risk.

Finally, the increased day-to-day variability of the federal funds rate imposes an obvious cost on depository institutions subject to reserve requirements. Because of the greater uncertainty about the rate level at which federal funds will trade during the week and the associated higher penalties for "poor" timing of federal funds transactions, depository institutions could be expected to devote more resources to forecasting daily federal funds rate levels and/or end up holding higher levels of excess reserves.[19] In either case, the depository institutions would attempt to pass on their higher costs to their customers.

Summary

Since the Fed adopted its new operating procedure on October 6, 1979, the short-run variability of interest rates has increased dramatically across the maturity spectrum. Although greater variability of the federal funds rate was expected as a direct implication of the new operating procedure, arguments based on the expectations theory of the term structure of interest rates suggested that the variability of longer-term rates might not increase commensurately. However, the results reported in this paper indicate that longer-term rates have become both more variable and more sensitive to movements in the federal funds rate.

Regardless of its source, increased variation in interest rates implies a decreased demand for fixed-income securities as a result of increased risk or uncertainty of return. The general level of interest rates must rise in order to induce investors to hold the quantity of fixed-income securities outstanding. Thus, increased interest rate variabililty implies higher marketing costs of Treasury debt. Most of the empirical evidence presented is consistent with this hypothesis. Of course, in assessing experience under the new operating procedure, these costs of increased interest rate variability must be weighed against any benefits of the new procedure in terms of more stable growth of the monetary aggregates and of nominal income.

[19]Average weekly excess reserves increased from 0.486 percent of total reserves in the year prior to October 6, 1979, to 0.622 percent in the year after. This increase marginally misses being statistically significant at the 5 percent level for a single-tailed test.

1980 developments in rural credit markets

Gary L. Benjamin

The volatility in interest rates and credit demands in national markets last year was more evident in rural areas than in past cyclical swings of the economy. The increased volatility in rural credit markets partially reflected bleak farm income prospects and uncertainties about the intent and implications of the credit controls imposed in mid-March. But the increased reliance of agricultural banks on interest-sensitive deposits was probably the major factor contributing to the greater volatility in rural credit markets.

The implications of this and other developments of last year are not yet fully comprehendable. But if there is a lesson in the developments of last year, it is probably that many of the barriers that shielded rural credit markets from cyclical swings in national financial markets in the past have been removed. This lesson may be more evident as various provisions of the Depository Institutions Deregulation and Monetary Control Act, signed on March 31, are implemented in the years ahead.

Farm income in 1980

The 1980 performance of agricultural lenders was greatly affected by the increased volatility in credit markets. It would be an oversimplification, however, to attribute their performance solely to credit market conditions. Developments in the real sector had a significant impact.

Farm income prospects were very bleak in the first half. Farm production expenses registered one of the largest relative increases in the past five decades in 1979 and further large increases were in store for 1980. Record crop production in 1979 portended large increases in carryover stocks and lower grain prices. Grain prices were also held in check by an embargo that lowered grain sales to the USSR from 25 million to 8 million metric tons and halted virtually all other agricultural shipments to the USSR. Livestock prices were suppressed because per capita meat supplies were at record levels following several years of expansion in pork and poultry production. The bleak first-half farm income prospects contributed to a plummeting in capital expenditures by farmers and a temporary decline of unusual proportions in farmland values. Surveys show that Seventh District farmland values declined 4 percent in the first half of 1980. These developments dampened borrowings by farmers, as did the record high interest rates that emerged early last year.

Farm income prospects improved considerably in the second half, but interest rates—after declining in the second quarter—rose to new highs again late in the year. The recovery in farm income was largely captured by livestock producers and those crop farmers whose production was least affected by the summer drought and searing heat. The brighter income prospects in the second half contributed to a strong rebound in farmland values, but did little to boost capital expenditures by farmers.

Commercial lending slowed

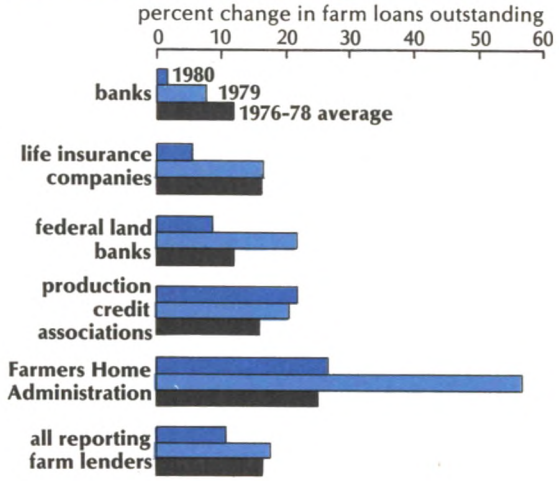
Institutions that lend to farmers are a diverse lot with differing organizational structures, investment alternatives, funding arrangements, and management objectives. This diversity accounts for considerable variation among agricultural lenders in their ability to weather periods of extreme volatility in credit markets. Banks and life insurance companies are most likely to curtail farm lending in the face of credit market volatility because of their many investment alternatives, internal profit objectives, and limited access to funding. The performance of the cooperative farm credit system (CFCS) is less susceptible. Because the CFCS consists of cooperatives, its

profit objectives are subordinated to the interests of borrowers. Investments by the CFCS are largely limited to the making of loans to farmers and their cooperatives. The system's access to national money markets minimizes funding problems. Government agencies—such as the Farmers Home Administration, the Commodity Credit Corporation, and the Small Business Administration—enjoy even greater insulation from volatility in credit markets. Funding of government agency loans is provided directly or indirectly through the U.S. Treasury. Because government agency lending to farmers is mandated by the Congress or the administration, decisions as to when and how much to lend are dictated by social objectives rather than profits.

The growth in farm debt held by all reporting farm lenders slowed in 1980.[1] Preliminary estimates show farm debt held by reporting institutional lenders rose only 11 percent last year, the smallest annual rise since 1972. But the increase was dominated by government agencies whose farm lending provides various degrees of subsidization.

Farm debt held by commercial (private) lenders—banks, life insurance companies, and the CFCS—rose only 9 percent last year. Except for the 1968-70 period—a time also marked by tight credit markets—that was the smallest annual rise in farm debt held by commercial lenders since the early 1960s. Moreover, farm debt held by commercial lenders increased by a smaller percentage last year than cash production expenses in the farm sector.[2] This had occurred in only two other years—1973 and 1979—since the 1940s. Had it not been for huge increases in government agency lending to farmers, the squeeze on farm financing resulting from the

Last year's slower rise in farm debt was particularly evident at banks and life insurance companies



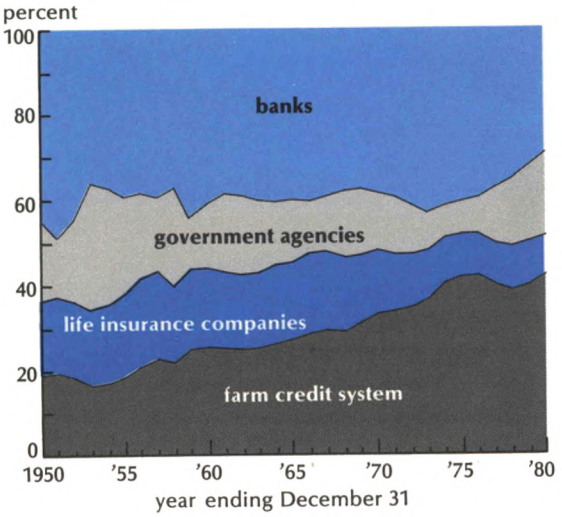
volatility in credit markets would have been far more severe the past two years.

Commercial banks. Of the major types of commercial lenders, banks were affected the most by the volatility in credit markets last year. This was of particular significance because banks account for nearly half of the institutionally held nonreal estate farm debt and a fourth of all farm debt. The liquidity of agricultural banks tightened substantially during the latter half of the 1970s as loan growth outstripped deposit growth. Loan/deposit ratios at District agricultural banks peaked in 1979 at levels 10 percentage points higher than in the mid-1970s. Moreover, the cost of funds at agricultural banks escalated rapidly as new types of interest-sensitive deposits proved especially attractive to rural savers. By the end of the first quarter of 1980, money market certificates (MMCs) accounted for 22 percent of resources at District agricultural banks, up from 12 percent six months earlier and up from 6 percent a year earlier. Large time deposits of $100,000 or more—which are also interest-sensitive—accounted for an additional 5 percent of agricultural bank resources.

[1]Reporting institutional lenders account for about 78 percent of the outstanding farm debt. The remainder is held by individuals and nonreporting institutions for which rigorous "benchmark" data are far less readily available.

[2]Despite inflation a cutback in capital purchases held the 1980 rise in cash expenditures for the farm sector to about 10 percent, below the increases of the previous two years.

Banks' share of all institutionally held farm debt has declined since 1973



The surge in growth of interest-sensitive deposits largely reflected a restructuring of existing deposits rather than new deposit inflows. Savers converted balances from checking accounts and time and passbook savings accounts into the record-yielding MMC accounts. But total deposit growth at rural banks was abnormally sluggish throughout much of 1979 and the first half of 1980, further aggravating the liquidity positions of rural banks.

The growth in interest-sensitive deposits sharply escalated the cost of funds to rural banks. Because of the higher cost and a rise in the potential returns on alternative investments, rates on bank loans kept pace with the sharp upturn in market rates of interest to a much greater degree than in previous periods of tight credit.

Because of tight liquidity and high loan rates at rural banks, there was widespread concern about the availability of credit to farmers. Some observers, linking the credit availability and low farm income issues together, argued that the plight of farmers was the worst since the Depression. To help ease the situation, the Federal Reserve System in mid-April temporarily streamlined the eligibility requirements for the "seasonal borrowing" privilege, and—for the first time—extended that privilege to nonmember banks. Many banks were eligible and initial interest in the program was very high. But only two loans were actually made under the program because agricultural banks found that the volume of farm loans demanded was unexpectedly low as a consequence of high interest rates and the pessimistic farm income situation.

The effects of these factors on farm borrowings at banks was evident throughout last year. Preliminary estimates show outstanding farm debt held by banks at the end of 1980 was only 1 percent higher than the year before. That represented the smallest rise since the mid-1950s and contrasted sharply with the average annual rise of nearly 11 percent the previous four years. It also marked the seventh consecutive year that the relative increase in farm debt held by banks has lagged that for all reporting institutional farm lenders. As a result, banks' share of all institutionally held farm debt has dropped from 43 percent to a post-World War II low of 30 percent.

The sluggishness that characterized farm lending in 1980 was also evident in all other credit extensions at rural banks. But while total loan portfolios showed little or no growth in 1980, deposit growth at agricultural banks rebounded to an uncommonly high level in the second half. The contrasting trends resulted in a remarkable improvement in liquidity, particularly at rural banks in the Midwest. At agricultural banks in the Seventh District, for example, loan/deposit ratios at the end of 1980 averaged about .605, down sharply from the peak of .676 the year before and the lowest in nearly four years.

Life insurance companies. The 1980 performance of life insurance companies—which account for 20 percent of farm real estate debt held by institutional lenders and 7 percent of all farm debt—was also affected adversely by the volatility in credit markets last year. As in the case of banks, last year's

retrenchment in farm lending by life insurance companies was more pronounced than in past cyclical swings of interest rates. The retrenchment, which started in late 1979 and lasted throughout 1980, was particularly evident in farm mortgage commitments and acquisitions. New farm mortgage commitments made by life insurance companies in 1980 were down about 55 percent from the year before, while farm mortgage acquisitions were down more than 40 percent. These declines substantially exceeded the retrenchment undertaken by life insurance companies during the 1974-75 cyclical swings in financial markets. Because of last year's cutback, farm mortgages held by life insurance companies at the end of 1980 were only 5 percent higher than the year before. This increase was down sharply from the average annual increase of 18 percent the three previous years and was the smallest annual rise for life insurance companies since 1972.

Last year's retrenchment in farm mortgage lending by life insurance companies primarily reflected liquidity problems, although borrowings were also suppressed by low farm earnings and high mortgage rates. The liquidity pressures arose from the strong policy loan demands that life insurance companies were facing. During the first half, gross policy loans made by major life insurance companies were 71 percent above the rapidly rising level of the year before. Funding those loans proved a substantial burden on life insurance companies' cash flows.

The developments in credit markets last year may have lasting implications for farm mortgage lending by life insurance companies. Life insurance companies have long prided themselves as the last "fixed-rate" commercial farm mortgage lender. But fixed-rate financial contracts of all types have been called into question by the volatility in interest rates over the past year or so. It now appears that, just as in the case of residential mortgage lending, renegotiable rate mortgages became widespread in farm mortgage lending by life insurance companies in 1980. A return to fixed-rate lending is doubtful, at least until interest rates are more stable.

The cooperative farm credit system

The volatility in financial markets last year affected the performance of the CFCS far less than that of other commercial lenders. The CFCS is the leading farm lender, accounting for 42 percent of all institutionally held farm debt and 32 percent of all farm debt. The system is comprised of three borrower-owned cooperatives that raise funds in national credit markets through the sale of consolidated debentures and lend those funds almost exclusively to farmers and farm cooperatives. Two parts of the system serve farmers directly. Production credit associations—working through Federal Intermediate Credit Banks—provide farmers with short- and intermediate-term loans. Federal Land Banks (FLBs) provide mortgage financing to farmers.

The ability of the CFCS to weather volatility in financial markets better than other commercial farm lenders reflects some unique characteristics of the CFCS that affect liquidity and borrower demand. Because of the ability of the CFCS to raise funds in national money markets through regularly scheduled debenture sales, the system avoids the liquidity problems that typically confront banks and life insurance companies during periods of tight credit markets. The funds cost more, but liquidity is less of a constraint to the CFCS than to private lenders.

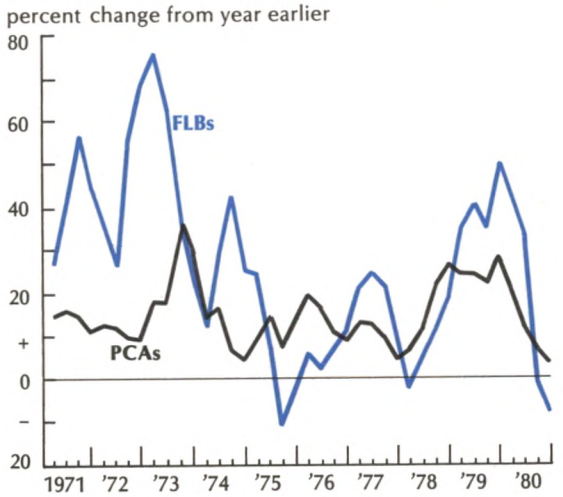
Another characteristic that provides the CFCS an advantage during periods of tight credit is the system's practice of pricing loans on the basis of its average cost of funds plus a markup for administrative overhead. This feature, plus the basic cooperative business structure of the CFCS and the restrictions limiting its investments exclusively to loans to member borrowers, provides the CFCS with competitively low interest rates on loans during periods of rising market rates of interest. Loan pricing practices of banks and life insurance companies, in contrast to the CFCS, tend to be tied more to the marginal cost of

funds—the cost of funding a new loan—and/or the opportunity rate of return—the return that could be earned by investing the funds in some asset other than a loan. When market rates of interest are rising, the average cost of funds approach to loan pricing results in lower loan rates than the marginal cost or the opportunity rate of return approach.

During most of 1980, CFCS loan rates were substantially below rates quoted by other commercial farm lenders, allowing the CFCS to attract a disproportionately large share of the farm sector's credit demands. While the loan rate advantage typically shifts to other lenders during periods of declining interest rates, the lower rates offered by the CFCS during 1979 and 1980 probably accounted for much of its relatively strong performance.

Production credit associations. Loans made by production credit associations (PCAs) were growing rapidly in 1979 and early 1980, exceeding year-earlier levels by 25 percent. But the year-to-year gains narrowed abruptly in the spring and exceeded year-earlier levels by only 5 percent in the second half. For the year as a whole, the rise in outstanding non-real estate farm debt held by PCAs was less than 9 percent, the smallest since 1972 and well below the annual average of 15 percent during the 1970s.

New lending by FLBs and PCAs slowed in the second half of 1980



Federal Land Banks. Lending activity at FLBs followed a pattern similar to that at PCAs. However, the cutback came late in the second quarter and—because new lending represents a far smaller share of the loan portfolio at FLBs than at PCAs—the dampening effect of no growth in the second half had a much less pronounced impact on outstandings. For the year outstanding loans at FLBs rose more than a fifth, substantially above the average annual rise of 16 percent in the 1970s.

The CFCS for years has used variable-rate lending practices exclusively. Ironically, in 1980 some FLBs modified the variable-rate practice at the very time that other lenders were beginning to realize that variable-rate loans could protect earnings in periods of rising interest rates. Funding the sharply higher new loan demands greatly escalated the average cost of funds at FLBs. At the same time, however, their practice of pricing mortgages on the average cost of funds basis held FLB mortgage rates well below rates available from other lenders, encouraging still higher demand for new borrowing.

To ease the burden of the rising cost of funds on existing variable-rate borrowers and to discourage inordinately high demands from new borrowers, some FLBs in early 1980 temporarily fixed rates on existing loans and adopted fees on new loans. The loan fees reached as high as 6 percent in the spring. Combined with a basic billing rate of 10½ percent and the normal stock purchase requirements, the rise in fees increased borrowing costs at FLBs to market levels and contributed to the flat performance in new FLB lending during the second half.

Government lending strong

Government agencies that lend to farmers filled some of the slack left by commercial lenders in 1980. In April concerns over low farm income and a perceived shortage of

credit from commercial lenders prompted the Congress to extend and expand the Economic Emergency Loan Program of the Farmers Home Administration (FmHA). The original terminating date for that program was extended from May 1980 to September 1981 and authorized outstandings for the program were expanded from $4 billion to $6 billion. Later in the year, widespread drought losses triggered a surge in applications for the FmHA's Disaster Loan Program. Such loans are available at interest rates as low as 5 percent to farmers who suffer a production loss of 20 percent or more due to a natural disaster.

Overall, farm debt held by the FmHA rose 26 percent last year. The increase, although less than the year before, extended the FmHA's record of disproportionately rapid growth since the mid-1970s. The FmHA now accounts for 15 percent of all institutionally held farm debt, up from 7 percent in the mid-1970s. Together, all government farm lending agencies—the FmHA, the SBA, and the Commodity Credit Corporation (CCC)—now account for 20 percent of all institutionally held farm debt, up from 8 percent in the mid-1970s and the highest proportion since the late 1950s when huge surplus stocks of grain rendered the CCC a major holder of farm debt.

The rapid rise in the share of farm debt held by government agencies reflects genuine congressional concerns about saving the so-called family farm, supporting beginning farmers, and protecting farmers from abnormal economic and natural disasters. Despite these concerns, the greatly expanded market share of government agencies has triggered a growing debate over the agencies' proper role in farm lending. The debate is largely focused on the FmHA and involves questions of degree of subsidization, the impact of FmHA lending on commercial lenders, misallocation of resources, and whether the FmHA is serving borrowers that would otherwise be adequately served, given the risk standards of commercial lenders. The outcome of the debate will be partially reflected in legislation that will replace the expiring farm program statutes in 1981. Whatever the outcome, those desiring a responsive government agency role in farm lending have received an additional bargaining point from the impact of volatile credit markets on farmers. It is clear that government agencies have mitigated much of the impact of credit market volatility on the farm sector.