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Reflections on the Current International Debt Situation

By Manuel H. Johnson

It is my pleasure to address colleagues from central banks on the issue of international indebtedness. This issue has touched on various responsibilities of central banks of both debtor and creditor countries. I would like to suggest several issues where I believe we have made progress in generating a broad consensus on international debt.

In my view, there is a broad consensus that we have an international debt problem because in the main borrowers and lenders agreed to loans that appeared rational in a world of low, or negative, real interest rates and rapidly expanding export markets. These loans turned out to be problems when real interest rates shifted sharply upward at the same time that export revenues to service those international debts became substantially less than anticipated because of the sharp and largely unexpected recession in the countries of the OECD region. Calculations of investment returns that were reasonable under existing conditions were invalidated by the unanticipated change in the economic environment. The changed environment required an adjustment in economic policies by debtor countries that was recognized sooner by some countries than others. It is probably scant comfort to many countries striving to renegotiate and restructure their external debts, or to their creditors, that the same economic factors of high real interest rates and declining output prices also struck several important and highly leveraged sectors in the U.S. economy, including energy producers, agriculture, and commercial real estate in certain geographical areas.

A second broad consensus is that resolution of the debt problem must have both an internal and external component and that actions by borrowers alone, while necessary, are not sufficient for dealing with the problem. The external conditions are, of course, economic growth and open access to major export markets in industrial countries and the level of world interest rates, which affects the size of the payments needed to service debt. In 1983 and 1984, economic growth in countries in the OECD region averaged about 3¾ percent per

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year, and the terms of trade remained constant for the 15 heavily indebted countries identified in Treasury Secretary Baker's 1985 speech in Korea. In 1985 and 1986, however, the recovery in the OECD countries was not sustained as economic growth declined to about 2¾ percent per year. The terms of trade for these 15 countries declined significantly over these two years, and their aggregate exports of goods and services declined about $25 billion, or by about one-sixth, between 1984 and 1986. Somewhat more than one-half of this decline in export revenues resulted from reduced export earnings associated with the decline in the price of oil.

Stagnant growth and rising unemployment in countries in the OECD region, of course, generate political pressures for protection that further complicate efforts by indebted countries to resolve their problems. In this regard, it is critically important that all industrial nations strive to keep their markets open to the exports of the developing nations. It is also equally important that countries currently enjoying large current account surpluses, including industrial countries such as Japan and Germany, adopt appropriate macroeconomic and trade policies to help absorb more imports from Latin America and the Caribbean area. In this respect, I am hopeful that the major industrial nations will implement the economic policy measures agreed upon at the meeting in Paris on February 22 of this year. The intention to implement these measures was reconfirmed by the G-7 nations prior to the meetings of the Interim and Development Committees in Washington in early April.

The internal component to dealing with the debt problem must also be recognized, and in this area much has been accomplished. The combined current account deficits of these 15 countries declined from an average of $50 billion in 1981 and 1982 to essentially zero in 1984 and 1985, with a small increase estimated for 1986 reflecting primarily the decline in oil prices. In 1979 and 1980, these countries imported an average of about $150 billion per year in goods and services. In the three-year period 1984-86, imports of goods and services of these countries averaged less than $110 billion per year, an extremely remarkable performance of domestic retrenchment.

The need for growth

The serious and painful adjustment by many of these countries has led to a third consensus, namely that any meaningful approach to the indebtedness problem must be growth oriented. The decline in the investment to GNP ratio in many Latin American countries was recognized as a serious cause of concern because investment is the key to future economic growth and the consequent easing of debt service burdens. To improve their prospects for growth spurred by increased productive investment, developing countries will need to maintain some continuing inflows of foreign capital to supplement their domestic savings. This implies some continued current account deficits, albeit smaller deficits than those that prevailed in the early 1980s. Productive use of these capital inflows will justify some increase in total indebtedness at a time when the existing size of external indebtedness is also presenting a burden.

The consensus of the need for growth was embodied in the broad principles of the Baker Initiative. Under that approach, growth was to be encouraged by a variety of domestic economic reforms that would improve incentives to save domestically and create more effective utilization of domestic resources, often through private sector initiatives. In addition, fiscal and financial incentives were to be implemented to bring about a retention and repatriation of domestic savings that had sought higher yields and greater security abroad.

The movement toward greater private sector development in many countries is certainly

encouraging, although it must be noted that when privatization simply replaces a state-owned corporation with a private monopoly, especially if there is access to subsidized credits, the gains in efficiency are likely to be limited. While defining, identifying, and measuring capital flight is clearly more of an art than a precise science, there does appear to be some evidence that a number of countries have had success in reducing or even reversing the outward flight of capital by their citizens. The establishment of confidence among local citizens is a very important development and should lead to increased confidence by nonresident investors.

The other two parts of the Baker Initiative were increased lending by both international financial institutions and private commercial banks. The international agencies appear to have been very constructive. The IMF has demonstrated flexibility in arranging innovative financing arrangements. In the early years of the debt problem, the IMF conditioned some of its lending on precommitments by commercial banks to provide financing of any remaining gaps. In several important cases, enhanced IMF surveillance has facilitated agreements between the borrower and commercial banks for multiyear restructuring agreements (MYRA's). For Mexico, the IMF has been willing to accept preadjusted performance criteria in new standby arrangements that take into account contingencies about the level of world oil prices and the performance of the domestic economy. That particular arrangement, while well suited to Mexico, may not be appropriate in other cases. In Mexico, as well as in several other heavily indebted countries, consultations with the World Bank have led to a credible agenda for restructuring changes that appear to be both politically feasible and economically efficient. Both the debtor countries and the World Bank deserve credit for these initiatives. In 1986, the multilateral development banks disbursed $4¾ billion net to the countries identified by Secretary Baker and such net disbursements are expected to increase further in 1987.

On the other hand, net new lending by commercial banks has been disappointing, even by the modest standards of the Baker Initiative of 3 percent per year for three years. The reluctance of many banks, particularly smaller banks, to lend is, of course, not surprising. While not wishing to appear an apologist for banks, I think it is important to note that there are several technical reasons why flows of new bank credit estimated from changes in the total stock of outstanding bank claims on two dates may be underestimating the true flow of new credits. These technical reasons include writeoffs of loans, which reduce the reported stock of outstanding credits when no repayments are made, assumption of loans by export credit or other guaranteeing agencies, and sales of loans to nonbank creditors. When these technical issues are properly taken into account, the lending response of banks may have been somewhat better than commonly reported. But even allowing for these adjustments, the response by commercial banks has, on balance, been disappointing.

Continued net new lending by private commercial banks is an essential part of a cooperative effort to resolve this problem. As noted in recent testimony by Chairman Volcker, doubts about the availability of necessary finance from commercial banks may be undermining the resolve of many indebted countries to implement needed economic reforms. Secretary Baker, in remarks to the Interim Committee of the International Monetary Fund, indicated that creativity of banks in developing a menu of new money options for borrowing countries was a necessary component for continued implementation of the debt strategy.

Too many lenders

A fourth broad consensus is that in the 1970s there were simply too many banks entering the

international lending market that had no real long-term interest or expertise to remain in that market. A survey conducted for the Group of Thirty, an independent group of experts on international financial issues, indicated that between 1973 and 1980 an average of 66 new banks per year entered international syndicated lending. This vast number of participating institutions, with different interests and agendas, has complicated and prolonged the process of restructuring the debts of many countries.

While it is imperative that the market for international bank lending remain competitive and large enough to provide the capability for new financing, the shrinkage in the number of participants currently under way could be a healthy long-term development if achieved in an orderly and equitable manner. On the other hand, it clearly does not seem appropriate for major money center banks whose customer bases are heavily trade oriented to retreat precipitously from international lending. A method needs to be considered where banks that opt out of participating in new financing packages do not receive the same collective benefits as those banks providing net new lending.

Too much debt

A fifth area of consensus is that the general structure of the external liabilities of the developing countries became too heavily weighted toward credit in general and bank credit in particular. According to an IMF study, between 1973 and 1983, the stock of foreign direct investment in developing countries grew at an average annual rate of 11.6 percent, while in the same ten-year period, the stock of debt to private financial institutions increased at an average annual rate of 28 percent. Consequently, direct investment as a share of total externally held claims on these countries declined from 36 percent in 1973 to 21 percent in 1983. The emphases on debt, at floating rates, made the borrowing countries highly susceptible to risks of changes in world interest rates.

Currently, we are witnessing important actions that recognize that the structure of external liabilities has become inappropriate. The innovative debt-equity swap programs announced by several countries in Latin America and elsewhere are a useful step in restructuring their external liabilities to reduce their vulnerability to interest rate swings. It is, of course, important not to overestimate the impact of these programs because they are mainly a restructuring of existing external liabilities with some reduction in required immediate future cash flows to service debts. Of themselves, these programs do not result in any net new money. Debt-equity swaps may, if large, raise concerns about monetary management because they increase the net supply of domestic financial assets and thus require offsetting monetary actions that are sometimes difficult to implement.

Debt-to-equity conversions, as well as other programs to encourage foreign investment, in the past have raised concerns about foreign control over sensitive domestic industries. As a general matter, these concerns may be alleviated by programs that encourage noncontrolling portfolio investments rather than outside control through the traditional mode of direct investment. Improvements in domestic equity markets and broadening participation by foreign portfolio investors in these markets can be important steps. The success of the International Finance Corporation in promoting closed-end mutual funds for developing countries such as Mexico and Korea is a helpful development that should be expanded.

A sixth, and probably most easily agreed upon consensus, is that the debt problem has gone on for a long time, participants are becoming increasingly fatigued and frustrated, and everyone wishes there existed a simple, neat, and low-cost resolution to this problem. While actively sought, such

a resolution appears to have eluded considerable analytic efforts. It is a complex, multi-dimensional problem that is not likely to yield to simple, single-dimensional solutions.

The debt and U.S. trade

Having discussed several areas of broad agreement, I would like to comment on an issue that has been raised in recent months, namely the linking of the international debt problem and the U.S. trade deficit. Some commentators have suggested that the increase in the U.S. trade deficit since 1980 and a concomitant loss in U.S. employment have been caused in large part by our deteriorating trade position with heavily indebted countries that have felt compelled to reduce their imports from the United States and that have succeeded in increasing their exports to the United States.

The facts do not appear to justify this simple linkage. Between 1980 and 1986, the U.S. trade deficit widened by about $120 billion, of which about $105 billion was due to a declining trade position with Japan, Canada, and Western Europe. In this same period, our trade deficit with Latin America widened by only $12 billion. Clearly the decline in the U.S. trade position was broadly based and resulted from a variety of factors, including an overvalued dollar and our higher relative growth rate. Altering our trade position with Latin America would not of itself make a great deal of difference in our trade deficit.

Second, in a complex economy such as ours, loss of a particular export market does not automatically translate into a precise number of lost jobs by some mechanical formula. While there are certain real costs of adjustment, in a dynamic economy that is consuming at a very high rate, any resources released from production for exports may well be absorbed into production for the domestic market. I might add that the converse is also true. As the decline in the foreign exchange value for the U.S. dollar works through to improve our trading position, a large proportion of our improved net exports will come from resources bid away from domestic absorption. The decline in the dollar should improve the U.S. trade balance with Latin America as U.S. companies become more competitive and displace other companies in exporting to that region. This expected change in the direction of Latin American trade will not necessarily affect the ability of indebted countries of that region to service their debts.

Summary and conclusion

Summarizing where we currently stand on the international debt situation is of course always difficult because events affecting individual countries or groups of countries evolve so quickly. The list of countries whose situations appear to be improving can also change quickly. In my view, some clear progress has been made in dealing with this problem. While the adjustment process has been painful, many of the more pessimistic predictions of a breakdown of world trade into economic autarky, a debtors' cartel, and so forth have failed to materialize.

The recently concluded new financing facility for Mexico is evidence that the banking industry is still willing to provide new funding to a major international borrower, although arranging such financing has clearly become more difficult and time-consuming. The resolution of financing packages for Chile and Venezuela and agreement on terms for the Philippines are also very important developments. The IMF and World Bank continue to be innovative and dynamic, and hopefully will remain adequately funded to perform their tasks. The exposure levels of U.S. and other banks relative to capital are below 1977 levels, which improves the stability of the financial system. World interest rates have come down considerably from their previous high levels. As

noted earlier, current account deficits of the 15 countries identified by Secretary Baker have been dramatically reduced.

Balanced against these favorable developments are the continuing high levels of debt and interest service on debt of many countries relative to their domestic product and exports and the failure of these ratios to improve significantly since 1982. Hopefully, faster growth of the domestic economies, expanded exports, and continued low world interest rates will result in an improvement in these ratios even if the absolute levels of external indebtedness continue to increase by modest amounts to facilitate growth. However, while progress can be cited, we must not rest on our laurels. We must build on the collective effort and the cooperative approach between borrowing countries, industrial countries, multilateral institutions, and commercial banks. The area where there is a particular need to improve is to speed the process of mobilizing commercial bank components of financial arrangements for borrowing countries.

In conclusion, it seems that despite the progress made in recent years to deal with the debt problem we can expect that it will be with us for a considerable time. The search for a universal solution to the international debt problem that will be demonstrably preferable to the flexible case-by-case approach being followed is likely to prove elusive. However, the current approach has been adaptive, and therefore, an open mind should be kept for all options that may prove applicable to specific situations.

Financial Stress in the Oil Patch: Recent Experience at Energy Banks

By Tim R. Smith

Dramatic changes in the world oil market in 1986 profoundly affected the domestic energy industry, general economic conditions in energy-producing states, and financial institutions in those states. In particular, financial problems in the energy sector have adversely affected many energy lenders, directly and through their indirect effect on other sectors. Although the general decline in the profitability of banks in energy states is well known, little information has been available about the relative performance of banks specializing in energy loans.

This article provides evidence on the performance of "energy banks" compared with other banks in the energy belt—a region of seven energy-producing states.[1] The first section reviews the origins of energy-related financial problems. Attention is focused on recent events in international oil markets and their economic effects on the energy belt states. The second section explores the recent deterioration in the performance of energy banks. These banks are compared with all banks in the region and the nation on the basis of overall profitability and loan quality. Conclusions regarding the outlook for energy lenders and their capacity to withstand future losses are presented in the third section. In brief, the evidence suggests that energy lenders can expect substantial problems to carry over from 1986.

Origins of energy-related financial problems

The boom in the 1970s and early 1980s

Many of the financial troubles plaguing energy-related businesses and their lenders are rooted in

[1] For the purposes of this study, the "energy belt" is defined as seven states—Colorado, Kansas, Oklahoma, New Mexico, Wyoming, Louisiana, and Texas. The first five states are Tenth Federal Reserve District states. Together, these seven states account for about two-thirds of the total U.S. employment in oil and gas exploration.

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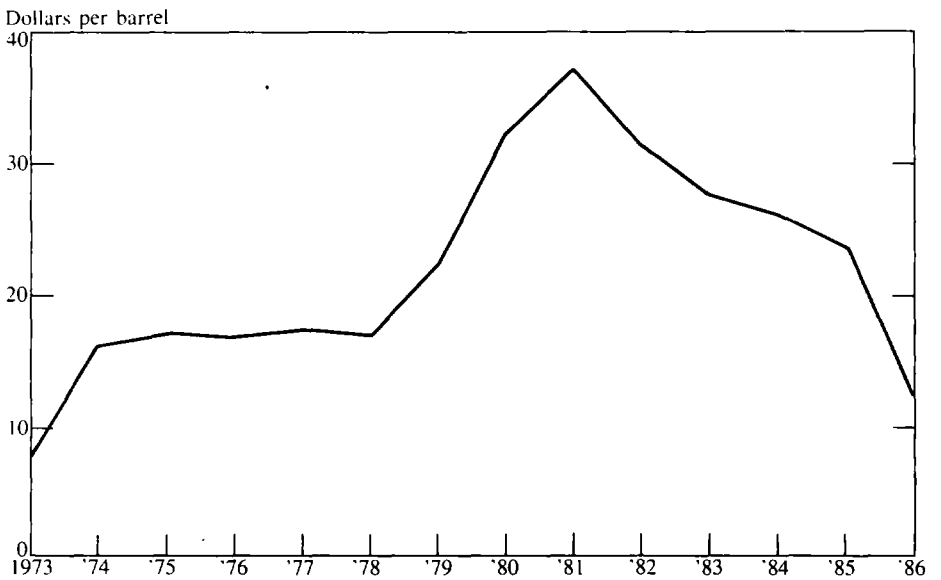
CHART 1

Refiner acquisition cost of crude oil*
(annual average, 1982 dollars)



Source: Department of Energy
*Constant dollar cost calculated using GNP Price Deflator, 1982=100

the 1970s and early 1980s, when bullish expectations for oil prices directed substantial economic resources to the energy belt. Both the Arab oil embargo in 1973 and the growing influence of the Organization of Petroleum Exporting Countries (OPEC) caused world oil prices to rise sharply in the 1970s (Chart 1).[2] Many in the energy industry and banks serving the industry believed oil prices would continue to rise for an extended period. Expectations of still higher oil prices in the future were necessary to make high-cost domestic sources economical to develop because of the long lags involved in discovering and developing petroleum reserves.

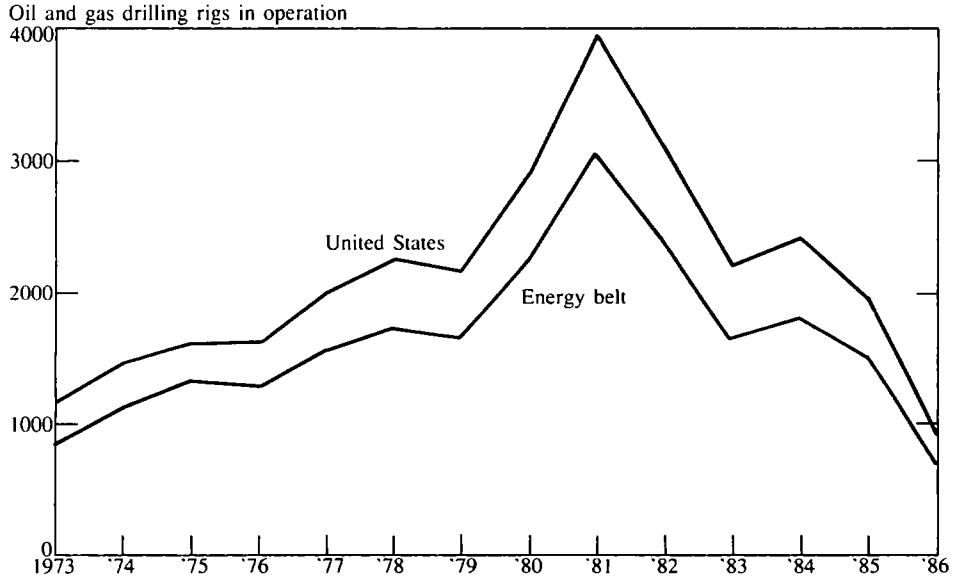
The domestic petroleum industry grew by leaps and bounds in the 1970s and early 1980s. The average number of oil and gas drilling rigs operating in the United States increased more than threefold between 1973 and 1981 (Chart 2). The nation's employment in oil and gas extraction doubled between 1973 and the end of the decade and rose 163 percent by 1982, when employment in the industry peaked at nearly a million workers (Chart 3).

Much of the growth in the domestic energy industry was concentrated in the energy belt. Together, the seven energy belt states—Colorado, Kansas, Oklahoma, New Mexico, Wyoming,

[2] The average cost to refiners of domestic and imported crude oil is used in this article to measure changes in world oil prices. This series of real annual average spot and contract prices gives a broad indication of relative price movements from year to year. Spot prices of key crude oils, such as Saudi Arabian Light and West Texas Intermediate, generally mirror the average refiner acquisition costs.

CHART 2

Drilling activity, energy belt and the United States



Source: Hughes Rig Count, *Oil and Gas Journal*

CHART 3

Employment in oil and gas extraction, energy belt and the United States

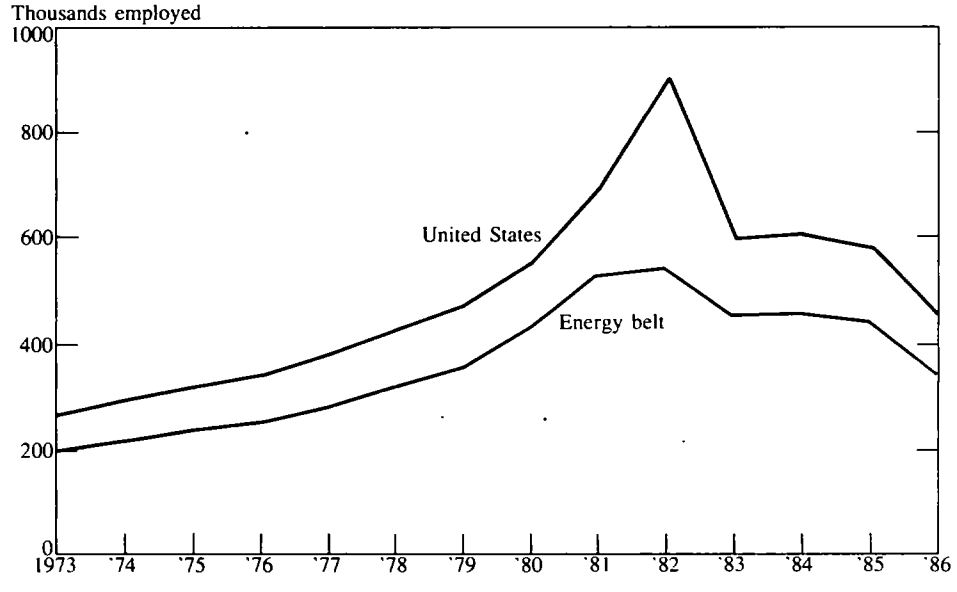
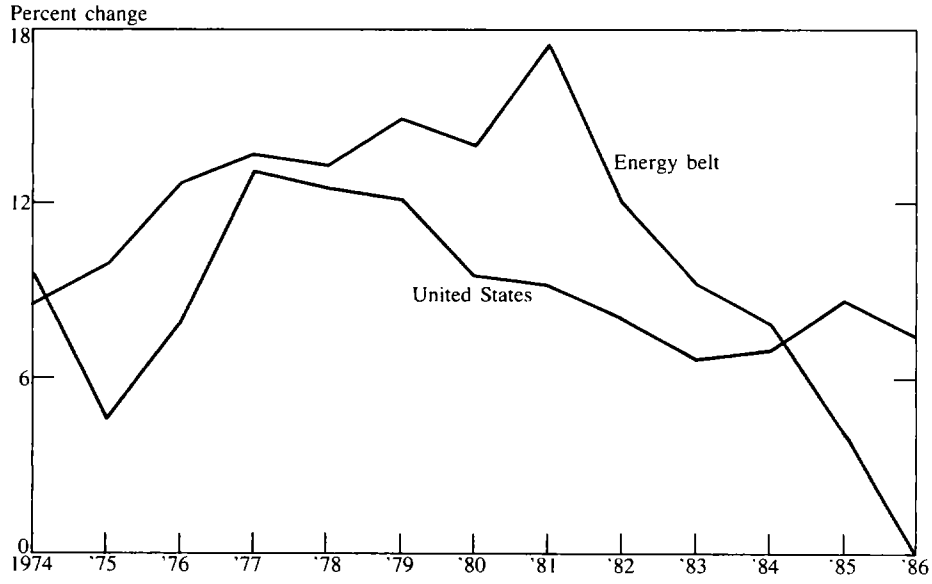


CHART 4

Growth in assets at insured commercial banks*



*Growth rates are calculated using end-of-year assets, fully consolidated net of loan losses, except for 1974. For 1974, asset growth is estimated using domestic assets only.

Louisiana, and Texas—together represent about two-thirds of the U.S total of both oil and gas drilling activity and employment. Therefore, the expansion in oil and gas drilling and employment in the 1970s and early 1980s, while national in scope, was centered mostly in the energy belt (Charts 2 and 3).

The general economic effect of the energy boom was especially strong in the energy belt. The oil and gas industry accounted for a much larger share of total economic activity in those states than in the United States as a whole. At its peak in 1982, oil and gas extraction accounted for 4.6 percent of the employment in the energy belt. In the nation as a whole, the proportion was only 1.0 percent. Thus, the energy-driven economies of these seven states were also more exposed to the adverse economic effects of the energy downturn.

Although banks outside the region—including some large money center banks—participated in the energy-lending boom, the thriving energy industry fueled a rapid rise in assets at energy belt banks (Chart 4). Assets at commercial banks in the energy belt tripled between 1973 and 1982. And the annual growth in assets at energy belt banks exceeded growth at all U.S. banks during that period. Much of this growth in assets likely came from the addition of energy loans and loans to nonenergy businesses that expanded as regional economic activity picked up.

Banks in the region made many types of energy loans, each with a different level of risk. Portfolios included many sound production loans secured by proven reserves. But they also included many risky loans that were secured by undeveloped energy properties and other loans to oilfield service companies, oilfield equip-

ment manufacturers and suppliers, contract drillers, and refiners. Many loans made during the boom were considered well secured at the time. No one predicted the events that would push large numbers of energy loans into troubled categories and lead eventually to numerous bank failures.

The oil price declines in the 1980s

World oil prices came under substantial downward pressure in the early 1980s from increasing non-OPEC supplies, especially from Britain, Norway, and the United States, and weak world demand for energy. OPEC's official prices were undermined by barter deals and other price concessions by member nations. In the face of these supply and demand pressures, OPEC lowered its official price in early 1983 from $34 a barrel to $28.50. Average world oil prices slid further to the $27 level in 1985.

The initial declines in oil prices between 1981 and 1985 led to a significant softening in economic conditions in the energy belt. Exploration and development activity slowed considerably. The average number of active drilling rigs in the energy belt was cut in half between 1981 and 1985. By the end of 1985, regional employment in oil and gas extraction had fallen about 20 percent from its peak in 1982. In addition to these direct effects on the region's energy industry, indirect effects on other parts of the regional economy, such as manufacturing and construction, caused economic growth in the region to lag far behind the nation after the 1982 recession.

Matters worsened in late 1985, when Saudi Arabia began aggressively expanding its market share. World petroleum prices fell when it became clear that OPEC's price and output agreement had become ineffective. The energy industry was still coming to grips with comparatively modest price declines when prices plummeted in the first few months of 1986. By midyear, the average cost of crude oil to domestic refiners had fallen to close to $11 a barrel with some spot market prices less than $10. Although Saudi Arabia later changed its oil policy and OPEC returned to a quota system to shore up prices, prices for the year averaged only $14.55 a barrel.

The domestic energy industry scaled down significantly as it adjusted to the break in prices in 1986. The consolidation of major oil companies picked up, as did the trimming of capital budgets that had started when prices began softening. Many independent producers went out of business. Drilling in the energy belt ground almost to a halt. The average number of active drilling rigs in the region fell almost 50 percent in 1986 to less than one-fourth the peak in 1981.

The employment effects were also large. Employment in oil and gas extraction in the energy belt fell 21 percent from the 1985 level. Again, the energy sector was a drag on overall regional economic performance, with large adverse effects on banks in the region.

Recent experience at energy banks

The downturn in the energy industry placed enormous stress on banks in the energy belt. The failure of Penn Square Bank in Oklahoma City in 1982 was the beginning of numerous bank failures. In 1985, 52 banks failed in the seven energy belt states. Bank failures in these states increased to 84 in 1986. Losses on energy loans were, of course, not solely responsible for all the bank problems. Indirect effects of the downturn in regional economic conditions and burgeoning financial difficulties in the agricultural sector also beset regional banks with loan losses and earnings difficulties. And all banks were having to cope with a decline in net earnings due to financial deregulation and a general decline in market interest rates.

The energy bank panel

The direct and indirect effect of the energy downturn on banks can be assessed by analyzing data from a sample of banks specializing in energy loans. In January 1986, the Federal Deposit Insurance Corporation (FDIC) identified 563 "energy banks" through a nationwide survey of FDIC-insured banks. Energy banks were identified generally as those with energy loans in excess of 25 percent of primary capital on December 31, 1985.[3] Energy banks outside the important energy belt region were excluded from the sample. Banks identified as energy banks but not reporting energy loan totals were also excluded. Therefore, the resulting panel of 321 energy banks can be considered only a regional sample.[4] The sample does not include all energy banks in the region. Nor does it consider participation in energy lending in the energy belt by banks outside the region. Nonetheless, the panel does provide a useful vehicle for comparing average loan quality and profitability data for a sample of energy banks with all banks in the region and in the nation.[5]

An examination of the loan portfolios at energy banks in the energy belt shows some important differences from the portfolios at all banks in the region (Table 1). Overall, energy loans account for 20 percent of the total loans outstanding at energy banks. On average, agricultural loans are less important to these banks than to other banks in the region. Real estate loans represent a somewhat larger proportion of loans at all banks than at energy banks, but nonresidential real estate loans are more important at energy banks. Consumer loans are a much larger proportion of loans at all banks than in energy banks alone.

Significant variation exists across energy banks of different size (Table 2). As a percent of total loans, energy loans are most important at the largest banks in the panel. At banks with more than $1 billion in assets, energy loans accounted for nearly 23 percent of the total loans. The largest 25 banks accounted for more than three-fourths of the $16.9 billion in energy loans outstanding at banks in the panel. The smallest size category, banks with less than $100 million in assets, included the largest number of banks but accounted for only about 5 percent of the energy loans represented by the panel. Agricultural operating loans were much more important at the small banks in the panel than at medium or large-size banks.

Profits at energy banks

Profits at energy banks declined sharply in 1986 (Chart 5). One common measure of bank prof-

[3] The FDIC list of energy banks was compiled from quarterly special energy loan data from national banks compiled by the Office of the Comptroller of the Currency (OCC) and a survey of FDIC regional offices. Since energy loan totals are not available from the banks' regular call reports and have not been rigorously verified by the collecting agencies, the list can be considered only a tentative and partial estimate. Disaggregated energy bank data from the FDIC and the OCC are examination data and, therefore, are not available to the public. Special permission was granted by the FDIC and OCC to use the individual energy bank data to compile the aggregate data reported in this article. For a general description of the FDIC and OCC energy bank data, see testimony by Robert V. Shumway, director, Division of Bank Supervision, FDIC, and Jonathan L. Fiechter, director, Economic and Policy Analysis, OCC, before the Senate Committee on Energy and Natural Resources, March 25, 1986. Also, see *Washington Financial Reports*, Vol. 46, No. 14, April 7, 1986, Bureau of National Affairs, Washington, D.C.

[4] As an updated list of energy banks and their energy loans was not available when this article was written, banks identified as energy banks at the end of 1985 were assumed to be energy banks at the end of 1986. Of the 321 energy banks identified in 1985, 304 remained at the end of 1986.

[5] The energy bank sample is compared with all banks in the energy belt because the sample does not include all energy banks. Since energy banks have not generally performed as well as other banks, such a comparison may understate the differences between energy and nonenergy banks.

TABLE 1
Loan portfolios at energy banks, December 31, 1985

	Level, Billions of Dollars		Percent of Total Loans	
	Energy Banks	All Banks in Energy Belt	Energy Banks	All Banks in Energy Belt
Agricultural operating loans	1.4	8.1	1.7	4.1
Real estate loans	26.1	67.9	30.9	34.4
Residential	5.6	23.1	6.6	11.7
Nonresidential	20.1	42.8	23.8	21.7
Farm	0.4	2.0	0.5	1.0
Consumer loans	8.2	32.2	9.7	16.3
Commercial and industrial and all other loans	48.9	88.9	57.8	45.1
Energy*	16.9	—	20.0	—
Total†	84.6	197.2	100.0	100.0

*Energy loan data are available only for banks in the energy bank sample. Other banks are not required to report energy loans.
†Individual loan categories may not add up to total due to rounding.

itability is return on assets (ROA)—net income divided by total assets.[6] ROA at energy banks fell from 0.32 percent in 1985 to −0.64 percent in 1986. This 0.96 percentage point drop was much larger for the group of energy banks than the 0.70 percentage point drop recorded for all banks in the energy belt. The negative ROA's at both energy banks and all banks in the region compare markedly with an ROA at U.S. banks of 0.65 percent in 1986.

The primary factor accounting for the larger decline in profitability at energy banks than at all banks in the region was an increase in loan loss provisions (Table 3). Net interest margin (NIM)—the difference between the yield on earning assets and the cost of funding them—dropped almost a half percentage point at energy banks and all banks in the energy belt in 1986. The increase in loan loss provisions was much greater, however, at energy banks than for all banks in the region.

Loan loss provisions increased dramatically at energy banks in 1986. The increase in loan loss provisions had a major adverse affect on the profitability of energy banks because these additions to the banks' loan loss reserves are subtracted from net interest income to determine profits.

[6] Assets are net of loan loss reserves. Regional data are based on averages of assets at the end of the year and the end of the preceding year. All data except energy loans were taken from Reports of Condition and Income filed by insured commercial banks. National data are from *Banking and Economic Review*, Federal Deposit Insurance Corporation, March/April 1987.

TABLE 2
Loan portfolios at energy banks by size category
(percent of total loans, December 31, 1985)

	Size of Energy Bank*			
	Less than $100 million	$100 million to $300 million	$300 million to $1 billion	Over $1 billion
Agricultural operating loans	7.4	2.2	2.6	0.9
Real estate loans	31.9	35.2	32.5	29.6
Residential	15.5	12.7	9.7	4.1
Nonresidential	14.5	21.8	22.3	25.2
Farm	1.9	0.6	0.5	0.3
Consumer loans	18.9	16.6	13.0	6.9
Commercial and industrial and all other loans	41.7	46.0	51.8	62.5
Energy	17.7	14.8	12.7	22.9
Number of banks	162	92	42	25
Percent of total energy loans in panel	4.8	8.4	10.4	76.3

*Based on end-of-year assets

Relative to assets, loan loss provisions at this group of energy banks increased 0.79 percentage points in 1986, 0.23 percentage points more than at all banks in the energy belt.

Although energy loan problems emerged when oil prices first began to fall, the quality of loan portfolios at energy banks clearly continued to deteriorate in 1986. Some of the increase in loan loss provisions was to cover higher chargeoffs of problem loans, and some of the increase was to cover future losses.

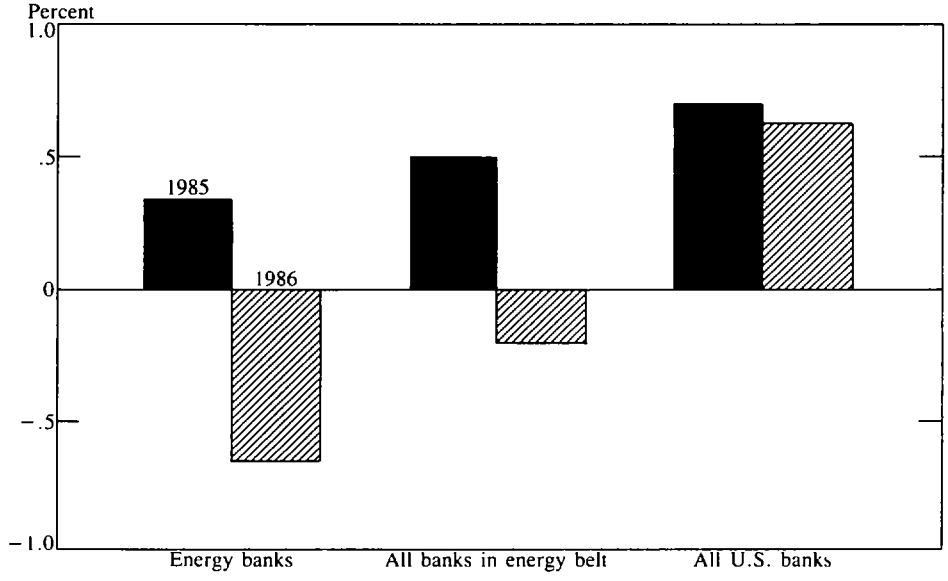
Credit quality problems

The average quality of loans at energy banks fell significantly in 1986. Net chargeoffs and nonperforming loans at energy banks increased substantially. Although the increase in total chargeoffs was about the same at energy banks as at all banks in the energy belt, chargeoffs at both groups increased more than at all U.S. banks (Table 4). And nonperforming loans increased more at energy banks than at all banks in the region and the nation (Table 5).

The deterioration in loan quality was due to both problem energy loans and the indirect effects of weak regional economic conditions. Falling oil prices impaired the ability of many energy borrowers to service their debt as cash flows and collateral values declined. Banks first encountered problems with loans to oilfield service companies and other exploration-related concerns. But as oil

CHART 5

Return on assets at energy banks*



*Net income divided by average assets

TABLE 3

Factors affecting bank profits

(percent of average assets)

	Energy Banks			All Banks in Energy Belt			United States		
	1985	1986	Change	1985	1986	Change	1985	1986	Change
Return on assets	0.32	−0.64	−0.96	0.49	−0.21	−0.70	0.71	0.65	−0.06
Net interest margin*	3.01	2.55	−0.46	3.89	3.43	−0.46	4.09	4.01	−0.08
Loan loss provisions	1.06	1.85	0.79	1.00	1.56	0.56	0.68	0.78	0.10

*Net interest margin is calculated on a taxable-equivalent basis

TABLE 4

Net chargeoffs by loan category*
(percent of total loans in category)

	Energy Banks		All Banks in Energy Belt		United States	
	1985	1986	1985	1986	1985	1986
Total net chargeoffs	1.7	2.3	1.5	2.2	0.9	1.1
Agricultural	3.1	5.8	2.7	3.4	3.7	3.9
Real estate	0.6	1.2	0.5	1.0	0.3	0.4
Consumer	1.3	1.7	1.1	1.6	1.0	1.4
Commercial and industrial and all other loans	2.3	3.1	2.2	3.2	1.2	1.3

*Net chargeoffs as percent of total loans in category on December 31

TABLE 5

Nonperforming loans by loan category*
(percent of total loans in category)

	Energy Banks		All Banks in Energy Belt		United States	
	1985	1986	1985	1986	1985	1986
Total nonperforming	4.8	7.0	3.9	5.7	2.6	2.8
Agricultural	8.4	7.0	5.5	6.0	6.0	6.3
Real estate	4.4	7.8	3.8	6.3	2.7	3.0
Consumer	1.1	1.6	1.1	1.5	1.0	1.1
Commercial and industrial and all other loans	5.4	7.4	4.9	6.7	3.1	3.2

*Nonperforming loans include loans 90 days or more overdue, nonaccruing, or renegotiated on December 31

prices fell, many production loans that had been made when oil prices were not expected to fall below $25 soon fell into problem categories. The downturn in the energy industry, continuing problems in the agricultural sector, and the generally weak regional economy also brought an increase in nonperforming nonenergy loans.

Loan losses increased sharply at energy banks and all banks in the energy belt in 1986. As a percent of total loans, net chargeoffs increased markedly at energy banks, from 1.7 percent in 1985 to 2.3 percent in 1986 (Table 4). While these chargeoff rates were slightly greater than at all banks in the energy belt, the increase was about the same as at all banks in the region. But both chargeoff rates for energy banks and all banks in the region were about twice the rates for all U.S. banks in 1986.

The broader effects of the downturn in the energy industry show up in significant losses in other loan categories. After agricultural loans, commercial loans had the next highest chargeoff rate. The commercial loan chargeoff rate was much higher in the energy banks and all banks in the region than at all banks in the nation. Although commercial loans include energy loans, this category also includes loans to nonenergy businesses that were adversely affected by financial problems in the energy sector.[7] Chargeoffs of real estate loans also increased in 1986. At 1.2 percent of total real estate loans, the chargeoff rate on these loans at energy banks was twice the rate in 1985.[8] The real estate loan chargeoff rate at energy banks was three times the rate at all U.S. banks. Consumer loan losses also increased at energy banks in 1986. Although losses on consumer loans increased nationwide, the loss rate at energy banks was 0.30 percentage points higher than at all banks.

The effects of the sharp decline in oil prices in 1986 are more evident in the increase in nonperforming loans at energy banks. Total nonperforming loans—loans 90 days or more overdue, nonaccruing, or renegotiated—increased significantly at energy banks in 1986 (Table 5). Credit problems at these banks worsened in nearly all loan categories. The only exception was in agricultural loans. And a sharp rise in nonperforming loans suggests that energy banks may encounter bigger loan losses in the future. Of total loans at these banks at the end of 1986, 7.0 percent were nonperforming, compared with 4.8 percent a year earlier. For all banks in the energy belt, nonperforming loans increased from 3.9 percent of total loans at the end of 1985 to 5.7 percent at the end of 1986. In contrast, nonperforming loans increased only slightly relative to total loans at all banks in the United States.

Although credit problems increased for most types of loans, the most striking increase at energy banks was in real estate loans. Nonperforming loans accounted for 4.4 percent of the total real estate loans at the end of 1985 and 7.8 percent by the end of 1986. This dramatic 3.4 percentage point increase far exceeded the increase in problem real estate loans for all banks in both the region and the nation.

Despite the high overall level of nonperforming loans in 1986, there was substantial variation in problem loans among energy banks. A distribution of energy banks by the proportion of nonperforming loans illustrates the scope of the credit

[7] Although chargeoffs of commercial loans (including energy loans) increased only 0.8 percent, compared with 2.7 percent for agricultural loans, commercial loans accounted for more than 70 percent of the total chargeoffs at energy banks in 1986 while agricultural loans accounted for only about 3.4 percent of total chargeoffs. Moreover, commercial loan chargeoffs accounted for a smaller proportion of total chargeoffs (about 64 percent) at all banks in the energy belt than at energy banks.

[8] For a discussion of the downturn in the Texas real estate market and its effects on banks, see Christine Blair and Frederick S. Carns, "After the Energy Downturn: Texas Real Estate," *Banking and Economic Review*, Federal Deposit Insurance Corporation, January/February 1987.

TABLE 6

Percentage distribution of energy banks by proportion of nonperforming loans December 31, 1985 and 1986

Percent of Nonperforming Loans to Total Loans at Banks	1985	1986
Below 2	25.2	13.2
2 to 4	34.0	28.0
5 to 9	27.1	35.2
10 to 14	8.7	15.1
15 to 19	2.8	4.6
20 to 24	2.2	1.6
25 to 29	0	1.3
30 to 34	0	1.0
Total number of banks	321	304

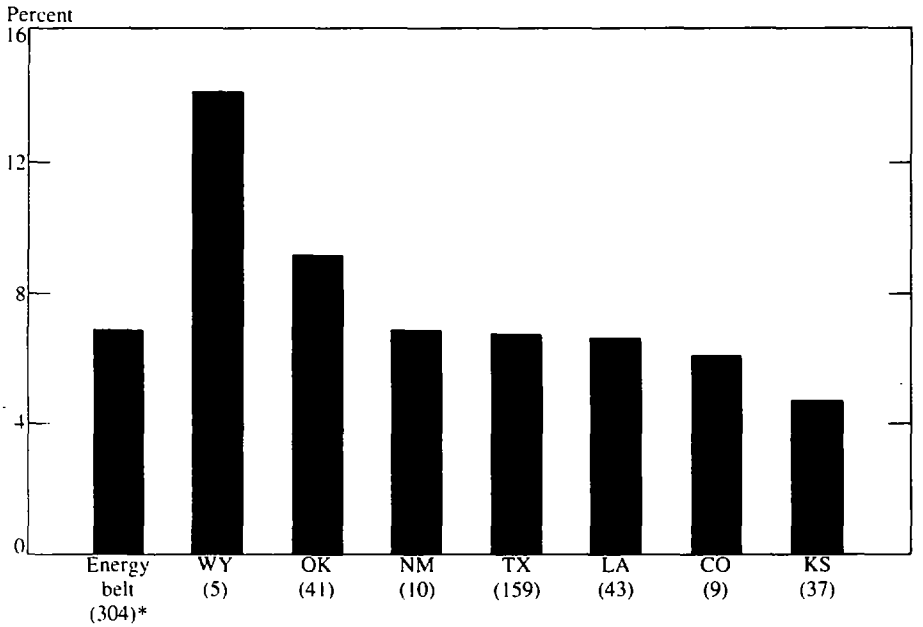
quality problem (Table 6). More and more energy banks with relatively high-quality loan portfolios developed problems as 1986 unfolded, and problems with loan quality worsened at energy banks that already had problems. Only 13.2 percent of the energy banks had less than 2 percent of their total loans nonperforming in 1986, about half the proportion of banks in this favorable category in 1985. The proportion of energy banks with nonperforming loans between 5 and 9 percent of total loans was 35.2 percent, compared with 27.1 percent in 1985. And the proportion of energy banks with more than 10 percent of their loans in troubled categories was 23.6 percent, up from 13.7 percent in 1985.

The outlook for future loan losses at energy banks varies somewhat across energy belt states. At the end of 1986, nonperforming loans at energy banks varied significantly, from 14.2 percent of total loans in Wyoming to 4.8 percent in Kansas (Chart 6). The proportions of nonperforming loans at energy banks in Texas and Louisiana were slightly less than the proportion for all energy banks. However, nonperforming loans were a much larger percentage of total loans for the large number of energy banks in Oklahoma.

The large increase in energy banks' nonperforming loans in 1986 calls into question the current condition of these banks and the course of profitability and bank failures in 1987. Since future loan losses are closely related to the current level of nonperforming loans, the increase in nonperforming loans in 1986 foreshadows likely increases in loan losses in 1987.

CHART 6

Nonperforming loans at energy banks, by state
(percent of total loans, December 31, 1986)



*Number of banks in parentheses.

Condition and outlook for energy banks

What is the outlook for energy banks, and how well prepared are they to withstand future losses? Loan losses in 1987 will result directly from ongoing weakness in the energy industry and indirectly from the ripple effects on other borrowers. The firming in oil prices in the first part of 1987 has improved cash flows for some oil producers. Though loans to some producers could be serviced, production loans made to high-cost producers on expectations of prices in excess of $20 to $25 a barrel will face ongoing difficulties.

Exploration and development loans that have not been written off also will remain under pressure. Although oil prices have firmed, uncertainty over how long OPEC's production agreement will hold and wide swings in crude oil inventories make prices somewhat volatile and a significant rebound in domestic drilling activity in 1987 unlikely.

The indirect effects of problems in the oil patch will probably be large at energy banks, with these indirect effects spilling over increasingly to other banks in the region. Some nonenergy commercial loans will be further impaired by the generally weak condition of the regional economy. The largest indirect losses will probably be associated with real estate loans. The relatively high levels of nonperforming real estate loans at energy banks in 1986 points toward additional real estate losses in 1987. This outcome is made more likely by the large proportion of nonresidential real estate loans at these banks. The value of commercial real estate in most of the energy belt has been under continual downward pressure as office, retail, and industrial vacancy rates have soared during the energy downturn.

TABLE 7

Distribution of energy banks by nonperforming loans as a percent of primary capital, December 31, 1985 and 1986

	Number of Banks					
	Less Than 50 Percent		50 to 100 Percent		More Than 100 Percent	
	1985	1986	1985	1986	1985	1986
Energy Belt	229	183	65	79	27	42
Colorado	4	3	2	5	3	1
Kansas	29	24	7	9	3	4
New Mexico	7	6	2	2	1	2
Oklahoma	26	20	13	9	8	12
Wyoming	2	3	1	1	2	1
Louisiana	28	24	10	11	6	8
Texas	133	103	30	42	4	14

The ability of energy banks to weather additional losses can be measured by the banks' capital positions. Primary capital—equity capital plus loan loss reserves—provides a cushion against losses. Primary capital at energy banks increased slightly from 6.76 percent of assets at the end of 1985 to 6.94 percent of assets at the end of 1986. Also, the 1986 capital-asset ratio at energy banks was a modest 0.10 percentage point less than the ratio for all U.S. banks.

Despite a stable overall capital-asset ratio for energy banks, the number of banks with problem loans in excess of primary capital rose in 1986. Of the 304 energy banks, 183 had more than twice as much primary capital as nonperforming loans (Table 7). However, 42 of the energy banks had less primary capital than nonperforming loans, up from 27 at the end of 1985.

The number of energy banks with weak capital positions varies across states in the energy belt (Table 7). Of the 42 energy banks with more nonperforming loans than primary capital at the end of 1986, 34 were in three states—Texas, Oklahoma, and Louisiana. Almost 30 percent of the energy banks sampled in Oklahoma have problem loans in excess of primary capital. In Texas, banks in this category accounted for about 7 percent of energy banks sampled in that state.

Increased levels of nonperforming loans in 1986 likely mean additional loan losses at energy banks. Several of these banks do not appear to have sufficient capital to sustain prospective losses. As a result, failures and mergers involving energy banks are almost certain to continue.

Conclusions

The recent downturn in the energy industry caused the performance of energy banks to decline in 1986. Profitability declined sharply as energy banks set aside additional reserves to cover mounting chargeoffs and nonperforming loans. Energy banks also did not perform as well as other banks, in either the energy belt or the United States.

Energy banks are almost certain to incur additional losses in 1987. The large numbers of nonperforming loans on the books of these banks at the end of 1986 portend loan losses in 1987 that could exceed those in 1986. The cash flows of some borrowers will improve from firmer oil prices, but oil prices are still lower than many bankers expected when the loans were made—and more uncertain. Although exploration and development-oriented borrowers would benefit from a significant turnaround in drilling activity, such a turnaround is not expected in 1987. And nonenergy loans at energy banks are almost certain to be impaired by the generally sluggish condition of the regional economy. Real estate loans appear to hold the next wave of problems.

While the overall outlook for energy banks is not good, energy banks appear headed for more problems in some states than in others. Texas, Oklahoma, and Louisiana not only have the largest total numbers of energy banks, but they also appear to have the largest numbers of banks with nonperforming loans in excess of primary capital. While many of these energy banks will be able to work through their problems, the incidence of bank failures and mergers could be highest in these three states.

Although any conclusions drawn from a limited sample of energy banks must be considered tentative, the sample does provide some information about the recent performance of these banks relative to all banks in the region and the nation. This information suggests that the problems that plagued energy banks in 1986 will continue in 1987 as the banks write down more direct energy loans and as regional economic adversity imperils increasing numbers of real estate loans and other nonenergy loans.

Has Deregulation Ruined M1 As a Policy Guide?

By Howard L. Roth

The apparent breakdown in the relationship between M1 and the economy that began in late 1981 triggered a heated debate. Although most economists agreed that the breakdown had been brought on by the nationwide introduction of NOW accounts, they were divided on the implications of the breakdown for the use of M1 as a policy guide. Some argued that the breakdown would only be temporary, that M1 would again be stably related to the economy once deregulation of deposit rates was complete. Others doubted this prognosis, believing that the deregulated M1 would remain so sensitive to developments other than the course of the economy that it would no longer be useful as a policy guide.

The behavior of M1 since 1981 has supported the pessimists' view. Although the deregulation of M1 has been completed, a reliable relationship between M1 and the economy has not reappeared. Uncertain about M1's relationship to the economy, the Federal Reserve decided not to establish a target range for M1 in 1987. Meanwhile, intense efforts are being made to understand the behavior of M1.

Some of these efforts to understand M1 have focused on the rates paid on M1 deposits. These rates have not behaved as was generally expected. The conventional wisdom a few years ago was that deregulated deposit rates would move in step with short-term market interest rates. As a result, it was thought that M1's appeal would be little affected by changes in market rates because spreads between the rates on the interest-paying deposits in M1 and the rates on other financial assets would remain relatively constant. Thus, it could be argued that deregulation would make M1 a better policy guide. Demand for M1 would vary less with market rates and would reflect to a greater extent developments in the goal variables of monetary policy—income and prices.

Contrary to what was expected, deregulated deposit rates have not moved in step with short-term market rates. Even though deregulation of rates on other checkable deposits (OCD's) was completed in January 1986, rates paid on OCD's

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did not decline as much as the higher rates paid on market instruments in 1986, causing spreads between OCD rates and short-term market rates to narrow.

Unexpectedly rapid growth of M1 during that time did not reflect the true state of the economy and raised the question of whether M1 might have become sensitive to changing portfolio preferences. If M1 did become sensitive to changing portfolio preferences, the sluggish adjustment of deregulated deposit rates was likely instrumental.

The likelihood that M1 might again become a useful policy guide would be increased if rates on deregulated deposits were to begin adjusting more rapidly. This article looks for evidence that deregulated rates are becoming more responsive to market rates. Finding none, it concludes that M1 will continue to be subject to changing portfolio preferences, particularly when market rates are trending in one direction or the other and that, as a result, conditions are not favorable for a quick return of M1 as a policy guide.

The remainder of the article is structured as follows. The first section argues that sluggish deposit rate behavior could impair M1's usefulness as a policy guide. The second section points out that in theory the sluggish behavior of OCD rates could continue. The third section shows that if Super NOW rates are indicative, sluggish adjustment of OCD rates is likely to continue.

Deregulated M1—not what was expected

An essential property of a policy guide is that it be closely related to the economic variables in which the goals of policy are specified. M1 has had this property in the past, but it appears to have lost this property in recent years. The deregulation of deposit rate ceilings and the subsequent behavior of deregulated deposit rates have likely contributed to the deterioration of M1's performance as a policy guide.

How deposit rate deregulation could impair M1 as a policy guide

To be useful as a policy guide, M1 must be closely related to income and the general level of prices in the economy. Without such a close relationship, the Federal Reserve cannot determine the level of growth in M1 that is consistent with sustainable, noninflationary economic growth.

Except for a few well-documented instances, M1 growth before the deregulation of deposit rates mainly reflected economic growth and inflation. This behavior was consistent with a transactions motive for holding M1—the holding of M1 balances in anticipation of spending. Growth of M1 was also influenced by short-term market interest rates, which affect the opportunity cost of holding transactions balances. But except for short-term market rates, growth of M1 depended primarily on economic growth and inflation. As a result, M1 was a good policy guide.

But M1 might not reflect economic growth and inflation so closely with the deregulation of rates on M1 deposits. Inflows of savings balances resulting from deregulation of deposit rates could weaken M1's relationship with the goal variables of policy because savings balances likely have different characteristics than transactions balances. For example, savings balances are likely to reflect decisions on how wealth is allocated among alternative financial and real assets—decisions that would not be heavily influenced by developments in income and prices. Rather, interest rate spreads between financial assets, and possibly between financial and real assets, are important considerations in allocating wealth as are inflation expectations and the relative riskiness of the assets in which wealth can be held. Therefore, if M1 became attractive as a repository for savings balances, it could be influenced more by changes in wealth, by interest rate spreads between OCD's and other financial assets, and by spreads between

OCD rates and returns on real assets—none of which are closely related to income and the general price level. In assessing a change in M1 over a period of time, policymakers are interested in determining how much of the change is due to changes in income and prices. Accurately estimating and subtracting out any changes in M1 due to changing portfolio preferences would make such a determination much more difficult.

Sluggish adjustment of rates on M1 deposits increases the likelihood that changes in portfolio preferences would affect M1 when short-term market rates trend upward or downward. The reason is simple. If other short-term rates change and the rate on OCD's does not keep pace, spreads between OCD rates and the other rates would change. Because M1's appeal as a savings vehicle depends on these spreads, demand for M1 as a savings vehicle would change when short-term rates change.

If instead, rates on OCD's followed market rates closely, M1's appeal as a savings vehicle would vary less with changes in market rates. M1 could still be appealing as a savings vehicle. But changes in market rates would have little effect on rate spreads involving OCD's and thus would have little effect on M1's appeal as a savings vehicle.

Rate spreads that change with market rates are problematic because much less is known about how the demand for M1 as a savings vehicle responds to changes in interest rate spreads than how the demand for M1 as a transactions medium responds. For example, it could be that M1 is appealing as a savings instrument only when the relevant interest rate spreads are less than some critical value. Demand for M1 as a transactions medium, on the other hand, is generally believed to vary continuously with interest rate spreads, at least for individuals. Moreover, the interest sensitivity of the demand for M1 as a transactions medium has been estimated in numerous empirical studies.

The problem is uncertainty about how M1's appeal as a savings vehicle varies with short-term market rates, not uncertainty about the sluggish adjustment of OCD rates. The adjustment of OCD rates could be perfectly understood and perfectly predictable, and uncertainty about how the demand for M1 as a savings vehicle responds to changes in rate spreads would remain if OCD rates responded sluggishly to changes in market rates.

Sluggish adjustment of rates on OCD's could pose problems in two other ways even if the demand for M1 were purely a transactions demand. First, slow adjustment of OCD rates can increase the sensitivity of M1 to changes in short-term market interest rates. Interest sensitivity increases when the OCD rate responds so sluggishly to changes in other short-term rates that spreads involving the OCD rate change proportionally more than the other short-term rates. When this happens, the effect of a change in short-term rates on demand for M1 is magnified, whether the demand for M1 is as a transactions medium, or as a savings vehicle.

An increase in the sensitivity of M1 to changes in short-term market interest rates increases the importance of being able to predict movements in short-term market rates in setting targets for M1. An unexpected change in short-term market rates could cause M1 to depart significantly from its targeted value. Unfortunately, interest rates have proven very difficult to forecast.

The second problem arises when there is uncertainty about the adjustment process. The problem is that the rate on OCD's has to be predicted in setting targets for M1. If the rate on OCD's closely followed other short-term rates, demand for M1 would likely be quite insensitive to changes in short-term rates, including the OCD rate, because the spreads between the OCD rate and other short-term rates would remain relatively unchanged when short-term rates changed. Predicting short-term market rates, including the

OCD rate, would be relatively unimportant in predicting M1. But when the OCD rate responds sluggishly to changes in other short-term rates, as it has since the beginning of deposit rate deregulation, changes in spreads can have an important effect on M1. In this case, accurately predicting short-term market rates, including the OCD rate, is important, and uncertainty regarding the precise nature of the sluggish adjustment of the OCD rate becomes a problem. The results of the empirical study of Super NOW rates in the last section of this article suggest that the adjustment of the OCD rate is a source of uncertainty.

Thus, there are a number of ways in which the deregulation of deposit rates might impair M1's usefulness as a policy guide. Although sluggish adjustment of the OCD rate to changes in other short-term rates can create a number of problems, the remainder of the article focuses on the problems posed by variability in the amount of savings balances held in OCD's that results when rates on OCD's adjust sluggishly. Thus, it is assumed for simplicity that changes in wealth, inflation expectations, and the returns on real assets have no effects on the demand for M1 as savings vehicle. That is, the demand for M1 as a savings vehicle depends only on rate spreads between OCD's and other short-term financial assets that are substitute repositories for savings balances.

The experience in 1985 and 1986

For a number of reasons, it appears that inflows of savings balances contributed to M1's growth in 1985 and 1986. First, growth of M1 was very strong relative to economic growth. While M1 grew 12.2 percent in 1985 and 15.6 percent in 1986, nominal GNP grew only 6.3 percent in 1985 and 4.2 percent in 1986. Chart 1 shows M1 velocity—nominal GNP divided by M1—on a quarterly basis since 1970. From 1970 to 1981, M1 velocity grew at an average annual rate of 3.7 percent, with growth ranging from 1.5 percent in 1979 to 6.1 percent in 1978. In sharp contrast, M1 velocity fell almost 6 percent in 1985 and more than 9.5 percent in 1986. This deviation of M1 velocity from its behavior in the 1970s was the latest manifestation of the apparent breakdown in the relationship between M1 and the economy in late 1981. From 1982 to 1986, the velocity of M1 fell at an annual average rate of 3.4 percent.

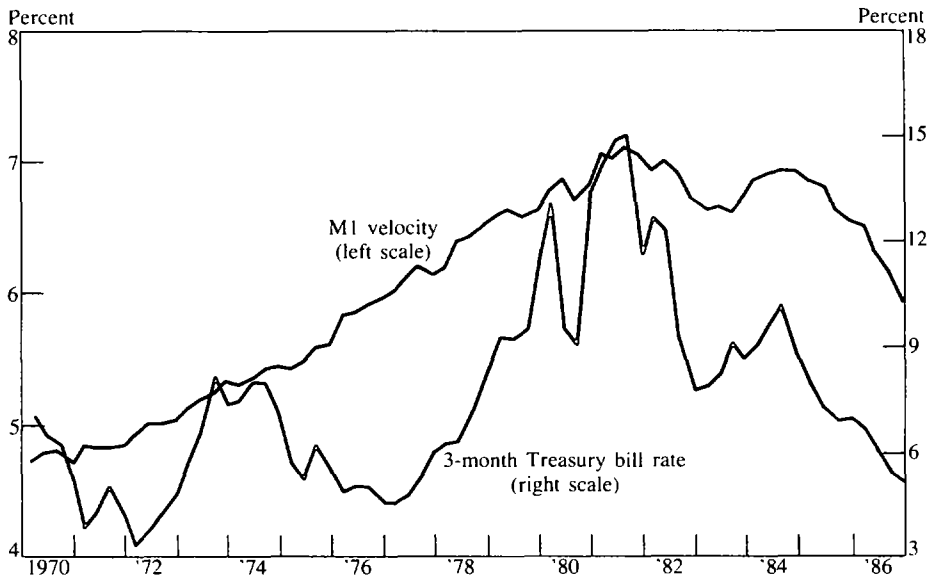
Experience suggests that the declines in short-term market rates during the past two years contributed to the decline of M1's velocity. Three-month Treasury bill rates fell from about 8.2 percent in the first quarter of 1985 to 5.3 percent in the fourth quarter of 1986 (Chart 1). But, previously reliable empirical models of money demand underpredict M1 growth even when simulated with actual levels of short-term interest rates, prices, and income over the two-year period. If declining short-term market rates are the answer, demand for M1 must have become more interest sensitive in recent years.

A second reason for suspecting that inflows of savings balances contributed to M1's growth the past two years is that the growth was strongest in OCD's, the component of M1 that is most attractive as a repository for savings balances. These accounts are liquid; that is, they can be exchanged quickly for other assets with no loss in value. Protected by deposit insurance, OCD's are virtually free of default risk. And of course, OCD's earn interest. As shown in Table 1, OCD's grew 22 percent in 1985 and nearly 29 percent in 1986, more than twice as fast as demand deposits and currency.

A third reason for suspecting that savings flowed into M1 is that rates on some savings alternatives fell relative to the rates on OCD's in 1985 and 1986, and growth of these alternatives slowed as growth of OCD's quickened. For example, as shown in Chart 2, the rate spread between small time deposits and OCD's fell from about 3.2

CHART 1

M1 velocity and the Treasury bill rate



percentage points in the first quarter of 1985 to about 1.0 percentage point in the fourth quarter of 1986. As a result, NOW accounts became more attractive as a repository for savings balances transferred from maturing small time deposits. And, as can be seen in Chart 2, growth of small time deposits slowed sharply while growth of OCD's picked up.

The rate spread between small time deposits and OCD's narrowed over the two-year period because rates on small time deposits matched declines in short-term market rates more closely than OCD rates did. As shown in Chart 3, rates on OCD's have displayed considerable inertia when short-term market rates, as represented by the federal funds rate, have changed.

TABLE 1

Growth of M1 and its components—1985 and 1986
(percent)

	Currency plus Travelers Checks	Demand Deposits	Other checkable Deposits	M1
1985:Q4/1984:Q4	7.8	8.9	22.2	12.1
1986:Q4/1985:Q4	7.5	11.6	28.6	15.2

CHART 2

Growth of small time deposits and OCD's

(percent change from a year earlier)

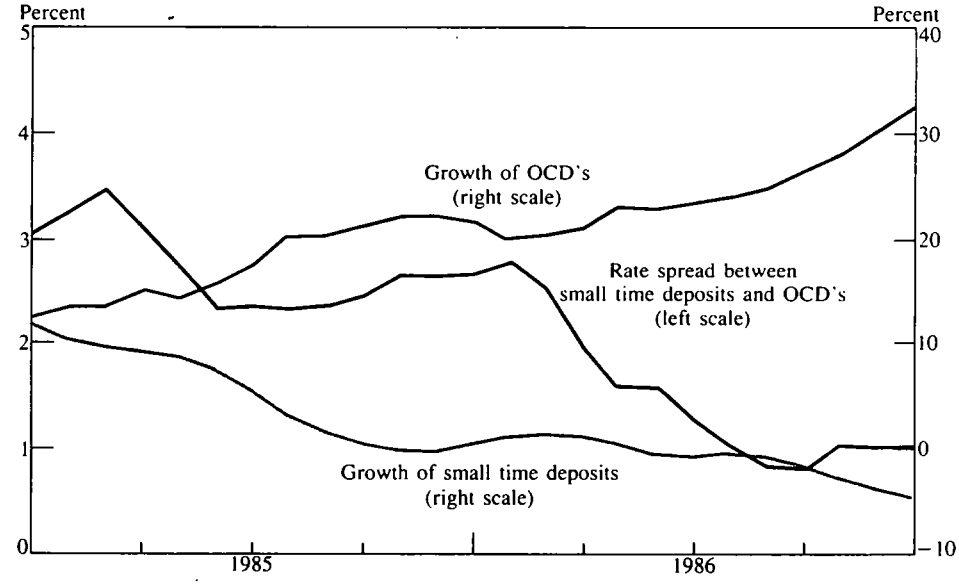
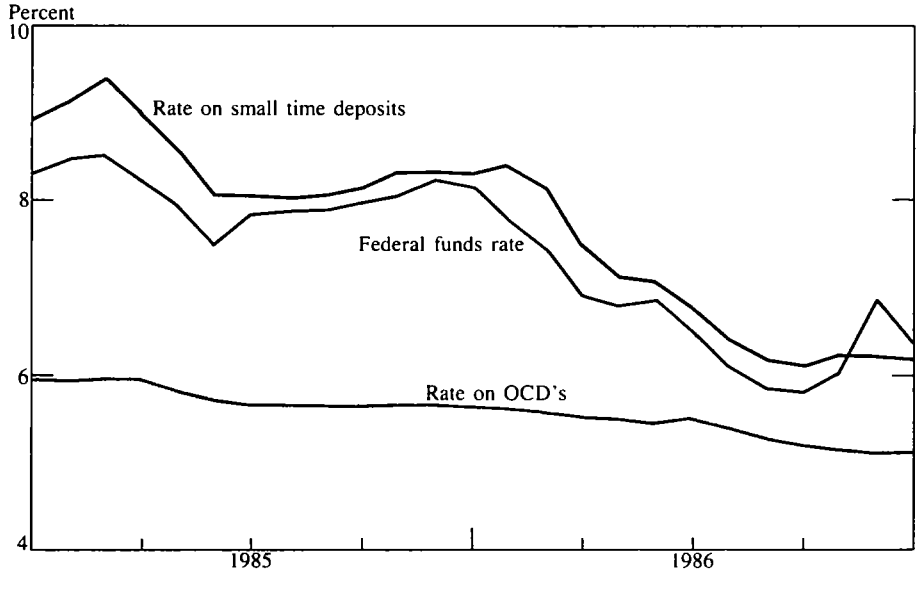


CHART 3

Sluggish adjustment of OCD rates



The sluggish response of OCD rates to changes in short-term market rates came as a surprise. The conventional wisdom in the early 1980s was that rates on deregulated deposits would closely follow short-term market rates. As a result, demand for M1 was expected to become insensitive to changes in short-term market rates. Yet, OCD rates have not followed short-term market rates closely. And this failure to follow other short-term rates closely could explain why recent empirical work and the behavior of M1 in the past two years indicate that demand for M1 has become more sensitive to changes in short-term market rates, not less sensitive.[1]

One important question is, Why have rates on OCD's exhibited so much inertia? Another important question is, Will this behavior be a lasting phenomenon?

Why rates on OCD's adjust sluggishly

Past regulation explains much of the sluggishness in OCD rates since deregulation of M1 began in 1981. Before January 1, 1986, rates on NOW accounts were subject to a ceiling of 5.25 percent. Many banks and thrifts had paid this rate since the nationwide authorization of NOW's in late 1980. Much of the sluggishness in NOW rates in 1986 may thus have been due to reluctance by banks and thrifts to lower rates on NOW's below the old regulatory ceiling. By the second half of the year, short-term market interest rates had declined to levels that made NOW rates higher than 5.25 percent artificially high. But banks and thrifts were concerned that pushing the rate below the old ceiling might antagonize customers accustomed to earning 5.25 percent on their NOW balances. Ironically, what had been a regulatory ceiling rate became a floor when NOW's were deregulated.

But regulation does not totally explain the phenomenon. Super NOW's were not subject to a ceiling since their introduction in January 1983, although they were subject to minimum balance requirements until January 1986. Yet their rates also displayed considerable inertia during this period. And rates on NOW's responded sluggishly to changes in short-term market rates after their ceiling was lifted in January 1986, even before their old ceiling began to have an effect. Thus, something in addition to banks and thrifts' concern about maintaining long-term customer relationships must give rise to the phenomenon.

A number of explanations have been offered. One possibility is that large banks and thrifts might be able to lower total funding costs by slowly adjusting OCD rates. Most large institutions have a relatively smaller presence in the national money markets than in the local OCD market.[2] Such an institution might be able to satisfy additional funding needs by buying funds in the money market at the rates prevailing there but would have to raise the rate it offers on existing OCD's if it tries to raise funds by attracting more OCD's. Under these conditions, changing the rate offered on OCD's to reflect fully changes

[1] See, for example, Richard D. Porter, Paul A. Spindt, and David E. Lindsey, "Econometric Modeling of the Demands for the U.S. Aggregates: Conventional and Experimental Approaches," Board of Governors of the Federal Reserve System (mimeo), November 1986, or Michael C. Keeley and Gary C. Zimmerman, "Deposit Rate Deregulation and the Demand for Transactions Media," *Economic Review*, Federal Reserve Bank of San Francisco, Summer 1986, pp. 47-62. For an alternative view, see Robert H. Rasche, "M1-Velocity and Money Demand Functions: Do Stable Relationships Exist?" *Carnegie-Rochester Conference Series*, forthcoming.

[2] Evidence of local and statewide Super NOW markets in the Twelfth Federal Reserve District was found by Michael C. Keeley and Gary C. Zimmerman in "Determining Geographic Markets for Deposit Competition in Banking," *Economic Review*, Federal Reserve Bank of San Francisco, Summer 1985, pp. 25-45.

in short-term market rates might result in higher funding costs. A second possible explanation also involves bank funding behavior. In this explanation, banks and thrifts respond to changes in loan demand by adjusting the rates they offer on managed liabilities and deposits with fixed terms—small time deposits, large CD's, term repurchase agreements—rather than the rates on nonterm deposits like OCD's. When loan demand weakens and banks' funding needs fall, banks lower their rates on deposits with fixed terms. At these times, the spread between term deposits and OCD's narrows, making OCD's relatively more attractive.[3] A third possible explanation is that depository institutions are taking a cautious approach to pricing OCD's as they try to learn how sensitive the public's demand for OCD's is to the rate offered on the accounts.

The first two proposed explanations suggest that the sluggishness of OCD rates will be a continuing phenomenon. But experience with deregulated deposits is too limited to determine which of these explanations best accounts for the sluggishness.

Even though the underlying cause of the sluggish adjustment of OCD rates has not been identified, it should be possible to measure the extent of the sluggishness. A number of researchers have done this.[4] Generally, they have found that Super NOW rates match only about 10 to 15 percent of a change in short-term market rates in one month. The extent of longer run adjustment varies across the studies and depends on the specification used in modeling the relationship between OCD rates and short-term market rates. But in some studies, complete adjustment takes as long as a year.

Although little is known about why rates on deregulated deposits adjust slowly to changes in short-term market rates, the staff of the Federal Reserve Board has shown that taking account of the sluggish adjustment of rates is beneficial in trying to account for the strong growth of M1 in 1985 and 1986.[5] When this behavior is explicitly modeled in the Board's quarterly econometric model, the interest sensitivity of M1 is considerably higher—approximately twice as high when market rates are 5 percent. Increased interest responsiveness of demand for OCD's is attributable for most of the increased interest sensitivity. The interest rate sensitivity of this component averages four times higher in absolute value in the respecified model. The increased interest rate sensitivity allows the respecified model to explain the growth of M1 in 1985 and 1986 more closely than most models that do not explicitly allow for sluggish adjustment of OCD rates.

Although rates on deregulated deposits in M1 were sluggish in adjusting to declining short-term market rates last year, this does not necessarily imply that rates on deregulated deposits did not adjust more rapidly to changes in market rates in 1986 than in, say, 1983. And it does not preclude more rapid adjustment of deregulated rates in coming years. If rates on deregulated deposits are moving toward more rapid adjustment, the likelihood of M1 again becoming a useful policy guide is greater.

[3] This rate spread behavior is an implication of an explanation for the rapid growth of M1 in 1985 and early 1986 proposed by Bharat Trehan and Carl E. Walsh in "Portfolio Substitution and Recent M1 Behavior," *Contemporary Policy Issues*, January 1987, pp. 54-63.

[4] See Paul F. O'Brien, "Deregulated Deposit Rate Behavior," Federal Reserve Board, processed, April 1986; George Moore, Richard Porter, and David Small, "Forecasting Retail Deposit Rates in the Long Run and the Short Run," Board of Governors of the Federal Reserve System (mimeo), July 1986; and John Wenninger, "Responsiveness of Interest Rate Spreads and Deposit Flows to Changes in Market Rates," *Quarterly Review*, Federal Reserve Bank of New York, Autumn 1986, pp. 1-10.

[5] See Richard D. Porter, Paul A. Spindt, and David E. Lindsey, "Econometric Modeling . . . ."

Slow adjustment of OCD rates—merely transitional?

The limited experience with deregulated deposits makes it difficult to predict whether the sluggish adjustment of OCD rates will be merely a transitional phenomenon that will abate over time. The account that would be the most likely to shed light on whether OCD rates will become less sluggish is the Super NOW account, which has not been subject to ceiling rates since its introduction.

The experience with Super NOW's

An immediate problem in studying the behavior of deregulated rates is a scarcity of data. OCD's became an appreciable part of M1 only with the nationwide introduction of NOW accounts in 1981. These accounts, eventually referred to as regular NOW's to distinguish them from the Super NOW account introduced later, were subject to a regulatory ceiling until January 1986. The rate most banks and thrifts paid on these accounts varied little from the regulatory ceiling of 5.25 percent over the five-year period. Thus, rates on regular NOW's have little to say about how ceiling-free deposit rates might behave.

The behavior of rates on Super NOW's, however, should be more representative of deregulated deposit rates. Super NOW's have never been subject to a rate ceiling. Experience with these accounts is limited, though, as Super NOW accounts were not introduced until January 1983. A change in the relationship between Super NOW rates and short-term market rates would not show up in quarterly or even monthly data on Super NOW rates unless the change was quite dramatic.

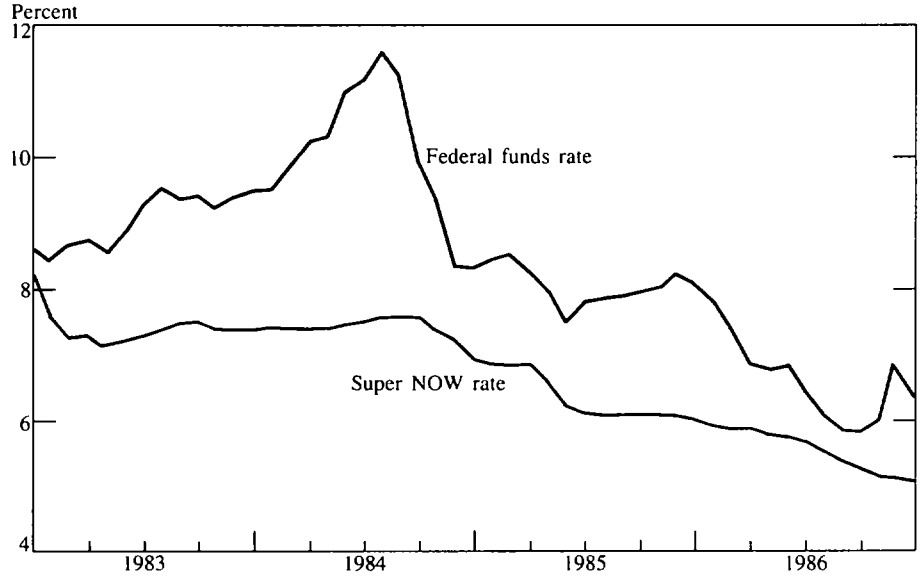
The *Bank Rate Monitor,* however, has been collecting weekly data on Super NOW rates since their introduction. With more than 200 weekly observations, a change in the relationship of these rates to short-term market rates should be more apparent.

When the Super NOW rate is viewed alongside short-term market interest rates, inertia in the Super NOW rate is evident. Chart 4 shows the Super NOW rate and the federal funds rate from 1983 through 1986. Three episodes of sluggish adjustment of the Super NOW rate stand out. Between January and August of 1984, the federal funds rate rose over 200 basis points, while the Super NOW rate rose only about 20 basis points. Between August 1984 and June 1985, the federal funds rate fell about 400 basis points, while the Super NOW rate eased less than 150 basis points. More recently, between December 1985 and October 1986, the federal funds rate fell about 230 basis points, while the Super NOW rate declined only about 80 basis points.

There is little indication in Chart 4 that Super NOW rates have become more responsive to changes in the federal funds rate. A gradual change might not be apparent, however. A test of this hypothesis requires the specification and statistical testing of a general model relating Super NOW rates to the federal funds rate.

A model relating changes in the Super NOW rate to changes in the federal funds rate is described in detail in the appendix. The model allows the Super NOW rate to adjust gradually to changes in the federal funds rate, with one rate of adjustment when the Super NOW rate is adjusting upward and another when it is adjusting downward. There are some indications that banks and thrifts adjust deposit rates more quickly when market rates fall to keep interest rate spreads from becoming too small or even negative, and the model allows for an asymmetrical response. The model also imposes complete long-run adjustment on the Super NOW rate so that the marginal cost to the bank or thrift of an additional dollar of Super NOW's is the same in the long run as the marginal cost of borrowing an additional dollar of federal funds.

CHART 4
Federal funds rate and the yield on Super NOW accounts



To test whether the relationship between the Super NOW rate and the federal funds rate has changed over the last four years, the model was estimated over three periods: July 6, 1983 to December 26, 1984; January 2, 1985 to December 31, 1985; and January 8, 1986 to February 4, 1987. Data from the first half of 1983 were excluded as Super NOW's were being promoted then with rates that were high relative to prevailing market rates. The breakpoint between the first and second periods is somewhat arbitrary, although it coincides with a reduction in the minimum balance requirement on Super NOW's. The breakpoint between the second and third periods marks the elimination of minimum balance requirements on Super NOW's and the lifting of the ceiling rate on regular NOW's.

Statistical tests of the model reveal no significant change in the relationship between the Super NOW rate and the federal funds rate in the first and second periods but a significant change in the third period.[6] The model is so complex, however, that it cannot be determined directly from the regression results whether the Super NOW rate adjusted more or less quickly in the third period. Simulating the estimated models establishes which was the case.

The model as estimated for each of the three periods was simulated for a once-and-for-all change in the federal funds from 6 percent to 5 percent. Estimated with data from the earliest period, the model of Super NOW rates adjusts completely in one year. The adjustment is about the same when the model is estimated with data

[6] The results of the statistical tests are given in the appendix.

from the second period, about 96 percent complete at the end of a year. But in the most recent period, the adjustment is only 64 percent complete at the end of a year. Thus, the adjustment of Super NOW rates was considerably slower in 1986 and early 1987 than in the two earlier periods.

A ceiling becomes a floor

Super NOW rates thus are apparently becoming less responsive to changes in short-term market rates. But this reduced responsiveness may not represent a trend but rather a special situation. As discussed earlier, banks and thrifts were reluctant to lower their NOW rates below the old regulatory ceiling of 5.25 percent in the second half of 1986 for fear of losing long-time customers. Another reason banks and thrifts were reluctant to lower rates on NOW accounts was fear that customers who previously held NOW accounts subject to the ceiling would come to expect the rate on their accounts to move above 5.25 percent when market rates warranted. The reluctance of banks and thrifts to lower rates below the old ceiling may thus account for some of the increased sluggishness in the Super NOW rate in the most recent period.

To test this hypothesis, the model was estimated over the entire sample period from July 6, 1983 to February 4, 1987 with an allowance for the possibility that banks and thrifts were reluctant to lower Super NOW rates below 5.25 percent. The results of the estimation support the hypothesis.[7] Thus, the slowdown in the adjustment of Super NOW rates in the most recent period results to some extent from a special circumstance. Be that as it may, however, the statistical tests show no signs of a transition to more rapid adjustment of Super NOW rates.

Conclusions

The finding that Super NOW rates are not becoming more responsive to changes in short-term market rates casts doubt on a quick return of M1 as a useful policy guide. Sluggish adjustment of rates on OCD's is likely to continue to create problems in using M1 as a policy guide.

This article has focused on one problem stemming from the sluggish adjustment of OCD rates. Because OCD rates adjust sluggishly, changes in short-term market rates affect rate spreads between OCD's and other financial assets and, as a result, increase the likelihood of M1 being affected by portfolio choices. Unfortunately, little is known about how the demand for M1 as a savings vehicle responds to changes in rate spreads. And, of course, changes in M1 resulting from changes in portfolio preferences shed little or no light on economic growth or inflation.

Strictly speaking, M1 has not necessarily become less closely related to income and prices. Rather, the relationship appears to have changed, and the new relationship is not well understood. Under these circumstances, determining the level of M1 growth that is consistent with attaining the goals of policy is difficult, particularly when the trend of short-term market rates changes unpredictably. This point can be restated in terms of velocity. Velocity growth does not have to be constant for M1 to be a useful policy guide. What is necessary is that velocity be predictable.

If rates on deregulated deposits had followed market rates more closely, changes in the relationship between M1 and the goal variables would likely have been more predictable. Spreads between OCD's and other financial assets would have been less affected by changes in short-term market rates. Therefore, M1's appeal as a repository for savings balances would likely have been

[7] See the appendix.

less affected. The relationship between M1 and the economy would have been less affected by changes in portfolio preferences.

Although the empirical results reported in this article suggest that M1 is not likely to return soon as a useful policy guide, two developments could speed M1's recovery. First, to the extent that flows of savings balances into OCD's in the past two years have been a one-time phenomenon, the relationship between M1 and the goal variables of policy could be more stable in the future. More specifically, the relationship will be more stable if the volume of savings balances in OCD's is not sensitive to future changes in rate spreads. If this is the case, changes in M1 will primarily reflect changes in spending intentions.

A second development that might speed M1's recovery as a policy guide would be continued progress toward price stability. Changes in rate spreads and, in turn, changes in portfolio preferences will be less likely if improved price stability can be maintained. Falling inflation expectations appear to have been a significant factor behind declining interest rates and rapid M1 growth in recent years. Changing rate spreads complicate the relationship between M1 and the goal variable of policy primarily when short-term interest rates are trending in one direction or the other. One of the policy victories of the 1980s has been a dramatic reduction in the rate of inflation. Consolidating the gains made against inflation would promote more stable inflation expectations and, in turn, more stable interest rates.

Has deregulation ruined M1 as a policy guide? It is too early to conclude that M1 has been permanently ruined. But M1's usefulness as a guide clearly has been damaged. And there is little reason now to believe that the flows of savings balances into M1 were a one-time phenomenon or that inflation expectations will have less effect on interest rates in the future. A reasonable assumption for now is that M1 will continue to be less closely related to economic growth and inflation, at least for a while.

Appendix

This appendix describes the model of Super NOW rate behavior used in the study, lists the estimated values for the parameter in the model, and documents the results of statistical tests conducted with the model.

Model of Super NOW rate behavior

For statistical reasons, the behavior of Super NOW rates was not modeled in this study as following market rates according to a partial adjustment mechanism. Rather, an error-correction model was used to relate Super NOW rates to a representative short-term market rate, the federal funds rate.[1] The model consists of two equations. The first is a long-run equilibrium relationship between the Super NOW rate and the federal funds rate based on cost minimizing behavior by banks operating in a competitive environment. This relationship, as estimated by researchers at the Federal Reserve Board, is

$$(1)\quad R_t^{SN} = -1.014 + 0.88\, R_t^{FF} + e_t$$

where R_t^{SN} is the Super NOW rate, R_t^{FF} is the federal funds rate, and e_t is the residual in

[1] The approach taken here is the same as that taken by George Moore, Richard Porter, and David Small in "Forecasting Retail Deposit Rates in the Long Run and the Short Run," Federal Reserve Board (mimeo), July 1986. See the references therein on the error-correction model.

period t.[2] This relationship was estimated using data from a monthly survey of deposit rates conducted by the Federal Reserve. The coefficient on the federal funds rate was constrained to equal 1 minus the marginal reserve requirement on Super NOW's, 12 percent, after unconstrained estimation yielded almost identical results.

The second equation specifies short-run dynamic adjustment of Super NOW rates, that is, how Super NOW rates behave when not in equilibrium. This behavior is given by

$$(2)\quad \Delta R_t^{SN} = a \cdot e_{t-1}^{P} + b \cdot e_{t-1}^{N} + \sum_{i=0}^{4} c_i \cdot \Delta R_{t-i}^{FF} + \sum_{i=1}^{4} d_i \cdot \Delta R_{t-i}^{SN} + f \cdot D1 \cdot e_{t-1}^{P} + u_t$$

where $\Delta R_t^{SN} = R_t^{SN} - R_{t-1}^{SN}$; e_t^P is the residual from Equation 1 when that residual is positive—that is, the amount the Super NOW rate exceeds its long-run equilibrium value—and is zero otherwise; e_t^N is the residual from Equation 1 when that residual is negative and is zero otherwise; and D1 is a dummy variable which equals 1 if the long-run equilibrium value of the Super NOW rate is less than 5.25 percent.

When a and b are negative, the first two terms on the right-hand side of Equation 2 force an out-of-equilibrium expected value of the Super NOW rate to return to its long-run equilibrium. Separate terms for positive and negative residuals allow the speed of adjustment of the Super NOW rate to depend on whether it is greater than or less than its long-run equilibrium value. The third and fourth terms allow for a very general reaction of the Super NOW rate to changes in the federal funds rate. The fifth term, incorporating the dummy variable D1, allows the speed of adjustment of the Super NOW rate to slow when the equilibrium rate is below 5.25 percent and the Super NOW rate exceeds the equilibrium rate.

Table A1 lists estimates of the parameters in Equation 2 when estimated over five periods.

Testing the stability of the relationship

To test whether the relationship changed over the three subperiods—January 6, 1983 to December 26, 1984, January 2, 1985 to December 31, 1985, and January 8, 1986 to February 4, 1987—the error correction model was estimated separately over each of these subperiods (columns 1, 2, and 4 of Table A1) and also over combinations of these subperiods (columns 3 and 5). An F-test conducted with the residuals of the regressions listed in columns 1, 2, and 3 of Table A1 indicate no evidence of statistically significant change in the relationship between the first two periods. But an F-test conducted with the residuals of the regressions listed in columns 3, 4, and 5 strongly rejects the hypothesis of no change in the relationship in period 3. The results of the F-tests are given in Table A2.

Effect of old regulatory ceiling

Simulations conducted with the model as estimated in each of the three subperiods demonstrated that Super NOW rates adjusted considerably slower in the most recent subperiod. To test whether this finding was due to the reluctance of banks and thrifts to lower their rates on Super NOW's below the old 5.25 percent regulatory ceiling on NOW's, a dummy variable accounting for this possibility was incorporated into the model and the model was reestimated over the entire sample period. The results of the regression, column 6 of Table A1, show the dummy variable to be a significant explanatory variable (f is significantly different from 0). If the equilibrium Super NOW rate is below 5.25 percent, the response to positive errors is a+f and is smaller in absolute value than a.

[2] See George Moore, Richard Porter, and David Small, "Forecasting Retail Deposit Rates . . . ."

TABLE A1

Short-run dynamic adjustment of the Super NOW rate

Estimated Parameters	Estimation Period: July 6, 1983 to Dec. 26, 1984	Jan. 2, 1985 to Dec. 31, 1985	July 6, 1983 to Dec. 31, 1985	Jan. 8, 1986 to Feb. 4, 1987	July 6, 1983 to Feb. 4, 1987	July 6, 1983 to Feb. 4, 1987
a	−0.033	−0.020	−0.024	−0.037	−0.013	−0.031
	(−2.743)	(−1.353)	(−2.876)	(−4.685)	(−2.829)	(−3.721)
b	−0.001	−0.049	−0.001	0.001	−0.001	−0.003
	(−0.371)	(−0.538)	(−0.302)	(0.056)	(−0.294)	(−0.669)
Σc_i	0.044	0.146	0.066	0.002	0.034	0.026
	(1.839)	(2.054)	(2.938)	(0.073)	(1.911)	(1.880)
Σd_i	0.564	0.547	0.518	−0.888	0.539	0.645
	(3.435)	(3.123)	(4.820)	(−2.629)	(5.471)	(3.856)
f						0.021
						(2.579)
Summary Statistics						
R^2	0.52	0.64	0.57	0.44	0.42	0.45
R^2adj	0.43	0.54	0.53	0.29	0.39	0.41
Standard error (percentage points)	0.021	0.028	0.024	0.026	0.026	0.026

Note: t-statistics in parentheses

TABLE A2

Stability tests

Periods of Comparison	F-statistic	Critical Value	Conclusion
July 6, 1983 to Dec. 26, 1984 and Jan. 2, 1985 to Dec. 31, 1985	1.24	1.88 (5%) 2.43 (1%)	No evidence of change in the relationship
July 6, 1983 to Dec. 31, 1985 and Jan. 8, 1986 to Feb. 4, 1987	6.83	1.85 (5%) 2.37 (1%)	Strong evidence of change in the relationship

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