ECONOMIC REVIEW

Federal Reserve Bank of Atlanta

November/December 1979

Federal Reserve Bank of Atlanta
Federal Reserve Station
Atlanta, Georgia 30303

Address Correction Requested

Bulk Rate
U.S. Postage
PAID
Atlanta, Ga.
Permit 292

FEATURES:

Director of Research: Harry Brandt
Business Editor: Gary W. Tapp
Editing Assistance: Adolpha Jordan
Production and Graphics: Susan F. Taylor and Eddie W. Lee, Jr.

Economic Review, Vol. LXIV, No. 6. Free subscription and additional copies available upon request to the Research Department, Federal Reserve Bank of Atlanta, Atlanta, Georgia 30303.

WHAT HAPPENED ON OCT. 6?

Several articles in this issue deal with the purposes, implementation, and effects of the actions announced by the Federal Reserve on Oct. 6. Below is a partial text of the Fed's press release stating what these actions were and why they were taken.

The Federal Reserve on October 6 announced a series of complementary actions that should assure better control over the expansion of money and bank credit, help curb speculative excesses in financial, foreign exchange and commodity markets and thereby serve to dampen inflationary forces.

Actions taken are:

1. A 1 percent increase in the discount rate, approved unanimously by the Board, from 11 percent to 12 percent.
2. Establishment of an 8 percent marginal reserve requirement on increases in "managed liabilities" — liabilities that have been actively used to finance rapid expansion in bank credit. This was also approved unanimously by the Board.
3. A change in the method used to conduct monetary policy to support the objective of containing growth in the monetary aggregates over the remainder of this year within the ranges previously adopted by the Federal Reserve. These ranges are consistent with moderate growth in the aggregates over the months ahead. This action involves placing greater emphasis in day-to-day operations on the supply of bank reserves and less emphasis on confining short-term fluctuations in the Federal funds rate. It was approved unanimously by the Federal Open Market Committee, which is comprised of all members of the Board of Governors and five of the 12 Presidents of the Federal Reserve Banks.

In announcing these changes, the Board issued the following statement:

"Inflation has continued at an exceptionally high rate over recent months. In part, the inflation rate reflects sharply rising energy prices, and those pressures should be subsiding in the months to come. However, appropriate restraint on the supply of money and credit is an essential part of any program to achieve the needed reduction in inflationary momentum and in inflationary expectations. Such restraint should help to avoid new uncertainties about the outlook for prices and distortions in markets that could aggravate the process of economic adjustment that is underway. It will help to restore a stable base for financial, foreign exchange and commodity pricing.

"Under the provisions of the Humphrey-Hawkins Act, the Federal Reserve sets yearly targets for the monetary aggregates and bank credit, and reports these targets to the Congress. At mid-year, the targets for 1979, encompassing the period from the fourth quarter of 1978 to the fourth quarter of 1979, were reviewed and reaffirmed at 1½ to 4½ percent for M_1, 5-8 percent for M_2, and 6-9 percent for M_3. These targets, after allowance for the smaller shift of demand deposits to ATS and NOW accounts, still seem broadly appropriate.

"However, growth over recent months in these aggregates and in bank credit has been more rapid than is consistent with those targets, and if unrestrained, would clearly be excessive in terms of our basic economic objectives. Recent Federal Reserve actions, taking account of inevitable lags, should work to contain money and credit growth in the months immediately ahead, consistent with the targeted objectives. The actions announced today are designed to provide further assurance that those objectives will be reached." ■

A TIME OF TESTING

Paul A. Volcker
Chairman, Board of Governors
of the Federal Reserve System

Remarks by Chairman Volcker before the American Bankers Association, New Orleans, Louisiana, October 9, 1979.

It is a very special privilege for me to have the chance to address so many bankers in assembled convention—but, just in case there are any doubts, I did not arrange the Federal Reserve announcements last weekend to honor this occasion.

In fact, those measures were not designed to make your life as bankers easier. Their purpose is rather to deal forcefully and responsibly with the economic and financial situation as we see it: strong inflationary pressures; concern, exaggerated concern in my judgment, that excessive growth in money and credit might be permitted by the Federal Reserve, fueling still more inflation; and an emerging speculative atmosphere and unsettled markets that could only complicate the job of restoring and maintaining orderly economic growth at home and stability in the dollar abroad.

I need not review with you all the trends and developments of recent years that have brought us to this crucial period for economic policy, nor emphasize the relevance of policies beyond the monetary and banking area. The problems and dangers are plain to see. Indeed, in our perhaps understandable preoccupation with what is wrong at the present time and in our doubts about the future, there may be another danger that is not so obvious; a justifiable sense of concern can spill over into a debilitating and unjustifiable sense of impotence and weakness.

The Facts Do Not Justify Cynicism. The simple fact is that, after months of focusing on our economic problems:

- More people are employed than ever before, over 10 million more than five years ago.
- An exceptionally long period of expansion has helped encourage and sustain investment despite inhibitions in the tax, regulatory, and inflationary environment.
- The Federal budget has come under better control, with spending moving somewhat lower in relation to the size of the economy, and with a substantially reduced deficit over the most recent years.

- In the face of unprecedented inflation and enormous new increases in energy prices, wage trends overall have not appreciably accelerated this year, reflecting, despite some disturbing exceptions, the discipline and good sense of Americans in general in accepting the need for restraint.
- Amid the strains imposed by the high price of oil and sometimes turbulent foreign exchange markets, a high degree of international cooperation has been maintained and protectionism has been checked—enabling, among other things, a substantial growth in American exports.

We would, of course, be blind if we failed to recognize that all these achievements, and much more, will be jeopardized by any failure to come to grips with the inflation that has become so pervasive. Monetary policy inevitably has an essential role in the process of restoring stability. The new Federal Reserve actions are a part of that continuing process.

Those measures were specifically designed to provide added assurance that the money supply and bank credit expansion would be kept under firm control. There will be one seemingly technical, but potentially significant, change in procedure in conducting open market operations. More emphasis will be placed on limiting the provision of reserves to the banking system—which ultimately limits the *supply* of deposits and money—to keep monetary growth within our established targets for this year. We have raised the discount rate—and will manage it more flexibly—so that restraint on bank reserves will not be offset by excessive borrowing from the Federal Reserve Banks. We have placed a special marginal reserve requirement of 8 percent on increases in "managed liabilities" of larger banks (including U.S. agencies and branches of foreign banks) because that source of funds has financed much of the recent buildup in credit expansion. That requirement, admittedly cumbersome by its nature, will be maintained so long as credit expansion is excessive.

None of these actions will prevent moderate growth in money and credit commensurate with the needs of the economy; they are designed to curb excesses that would otherwise spill over into inflation. Let me speak quite directly and frankly to the responsibilities of the banking system and banking leaders in that connection. One of the glories and strengths of our system is that we rely on private markets and decentralized decisions, responding to market incentives, in pricing and allocating credit. But

"None of these actions will prevent moderate growth in money and credit commensurate with the needs of the economy; they are designed to curb excesses that would otherwise spill over into inflation."

those decisions do have to be made by all of you individually in your own institutions. In a situation in which there could be greater day-to-day or week-to-week volatility in money market rates—not in itself a matter of great consequence for the economy—pricing of your own loans seems to me more a matter of responsible business judgment than of following a rote formula, related solely to the cost of some small margin of

loanable funds. The Board of Governors has particularly stressed its own concern that, in a time of limited resources, banks should take care to avoid financing essentially speculative activity in commodity, gold, and foreign exchange markets. Bankers familiar with their own markets can, without doubt, make judgments that none of us in Washington can, or ever could, make about what loans best serve the continuing needs of customers, business and personal, and the country alike. But my general feeling is that this is hardly the time to search out for exotic new lending areas or to finance speculative or purely financial activities that have little to do with the performance of the American economy, and indeed may detract from it.

This is a time of testing—a testing not only of our capacity collectively to reach coherent and intelligent policies, but to stick with them. In approaching this test, the facts do not justify the skepticism, and even cynicism, that is heard on so many sides.

- Some would suggest that we, as a nation, lack the discipline to cope with inflation.

  I simply do not accept that view.
- Second, some would argue that inflation is so bound up with energy prices, sluggish productivity, regulation, and other deep-seated forces that monetary and fiscal policies are impotent.

  I do not accept that view.
- Third, some would stipulate that we face impossible choices between prosperity and inflation.

  The simple facts of the past, in the United States and elsewhere, refute that view.

Let me take the first point. I do not claim any special expertise in reading public opinion. But the dramatic swelling of national concern about inflation—a concern that seems to transcend economic, social, and indeed political philosophies—seems to me unmistakable.

"This is a time of testing—a testing not only of our capacity collectively to reach coherent and intelligent policies, but to stick with them. In approaching this test, the facts do not justify the skepticism, and even cynicism, that is heard on so many sides."

We need not rely on opinion polls or personal impressions. We have been assailed almost daily for months with learned and not so learned analyses about the prospects for a downturn in business activity. I understand the reasons for concern, particularly given the high level of inventory accumulation in recent months. But the Administration and the Congress have united in clearly rejecting the seductive course of budgetary easing and tax reduction in recognition of the ultimately greater threat to stability inherent in the inflationary process. Restrictive monetary policies are never calculated

to win popularity contests; yet there has been acceptance of the need for restraint even at rates of interest that are almost outside the range of our historical experience.

Indeed, the Congressional committees responsible for oversight of the Federal Reserve have been among the strongest voices urging that we set forth and adhere to monetary targets, reducing them over the years ahead as an essential part of the effort to restore price stability. I believe we are coming to understand that our only real prospect of early and sustained declines in interest rates lies in coming to grips with inflation. I would note too that the "National Accord" recently reached between the Administration and American labor leadership plainly recognized the threat to full employment, incomes, investment, and growth inherent in the inflationary process, and for those reasons gave "top priority" to the "war on inflation."

"Attempts to pin all the blame for inflation on factors outside of our control would only doom our efforts to futility."

Long Term Discipline is Required. Of course, the skeptical can suggest that the consensus will buckle and fracture under the first real strains. But in assessing the prospects and policies, let us be clear on one important analytic point. There is clearly a time when, if business activity should recede, some of the outward manifestations of fiscal or monetary policy—the size of the budget deficit or interest rates—will change. Built-in stabilizers in the budget come into play, increasing the deficit temporarily. When the money supply is brought clearly under control and expectations of inflation dissipate, interest rates will tend to decline, and our recent actions should bring that day sooner, whatever the initial impact on interest rates. Developments of this sort are in no sense inconsistent with maintaining the firm discipline on Federal spending and growth in the money supply that will be required over a long period of time to restore price stability.

Some have raised the question of tax reduction. If earned by sustained spending restraint, well-structured tax reductions—by which I mean changes that would help stimulate investment, cut costs, and offset the effects of inflation in moving people into higher tax brackets—could be welcome at some time in the future. That time has not yet come, nor is it useful now to speculate when it might. What we need to guard against is premature and excessive stimulus, during expansions as well as recessions—and it does seem to me that we have come a long ways, at the very least, toward learning that lesson.

I do not minimize the influence of more structural factors in our inflation—least of all the deplorable performance of productivity and the impact of energy prices, now rising at a rate of 70 to 80 percent a year. The traditional instruments of monetary and fiscal policy can do little directly to influence productivity or the supply of oil.

But let us not lose sight of the fact that inflation not only grows in part out of these factors, but that oil pricing and productivity performance are themselves influenced by the instabilities and uncertainties related to the underlying inflationary process. Attempts to pin all the blame for inflation on factors outside of our control would only doom our efforts to futility.

We can take some comfort from the fact that the rate of inflation in most sectors of the economy is today substantially below the levels so depressingly reported month after month in the headlines; energy alone has added about 3 percent to the consumer price index in the past three months. As the rate of increase in energy prices subsides—as it should in coming months—the inflation rate as a whole should also decline appreciably. Looked at another way, the immediate challenge is to avoid imbedding the current rate of inflation in expectations and wage and pricing decisions before the current bulge in prices subsides. That is not an unrealistic objective, but it is one that will require discipline over the months ahead.

Either/Or Theories No Longer Enough. That necessary discipline seems to me challenged by what I think of as the theories of "either/or":

- Either we fight inflation or we prevent a recession.
- Either we seek a strong and stable dollar internationally or we attend to our problems at home.
- Either we do what's good for the long run or we follow short run expediency.

There was a day when our problems seemed to fall into such convenient analytic compartments. Most economists of my generation have made a career of analyzing so-called "tradeoffs" between inflation and employment, between external and domestic stability, between the long and short run. But that theorizing has been rooted in certain assumptions—assumptions that are now suspect—about the stability of expectations. When expectations of future inflation are so strong and potentially volatile as they have become, the "tradeoffs" disappear, or they appear in a much different light.

The lesson of the 1970's—here and abroad—simply does not bear out the "either/or" approach.

- More inflation has been accompanied not by less, but by more, unemployment and lower growth. We have not "traded off" one for the other.
- A weak dollar externally aggravates inflation at home, and a weak dollar at home undermines the dollar abroad. Fundamentally, what disturbs Peoria disturbs Zurich.
- After years of inflation, the long run has caught up with us. We can no longer blithely assume we can "buy" prosperity with a little more inflation, because the inflation itself is the greater threat to economic stability.

The real message of these lessons seems to me more hopeful than discouraging. Let me state the propositions in a more positive way.

"When expectations of future inflation are so strong and potentially volatile as they have become, the 'tradeoffs' disappear, or they appear in a much different light."

Turning the Corner. As we turn the corner on prices, upward pressures on wages and other costs—including interest rates—should subside. As confidence in the currency is strengthened, improving conditions in money and capital markets will help support

investment activity, and we should have a firmer base for investment planning, improving the outlook for purchasing power and productivity. A stronger dollar at home will bring it renewed strength internationally, and a strong dollar abroad will support our efforts to combat inflation at home. Appeals for moderation in petroleum pricing would have a new force and substance.

I do not delude myself that this is yet the world in which we live.

"As confidence in the currency is strengthened, improving conditions in money and capital markets will help support investment activity, and we should have a firmer base for investment planning, improving the outlook for purchasing power and productivity."

What we can do, and I see no reasonable alternative, is to start the process—to turn the corner—to demonstrate the conviction that we have the wisdom and fortitude to maintain the financial discipline required to cope with inflation. In the process, we must, of course, be mindful of the business situation in the United States—and I count on you to make the lending decisions that distinguish between the support your customers require and the excesses that only aggravate and distract the adjustment process that is under way.

When I accepted this invitation to speak to you, I had a quite different address in mind—one focusing on the so-called "membership" problem and the necessary restructuring of reserve requirements. I decided to forego that theme in light of recent events. But let me note the obvious—that the problems are not unrelated, for they both concern the role and effectiveness of monetary policy and a strong central bank.

The central purpose of the proposed legislation is, after all, to strengthen our ability to conduct monetary policy in all foreseeable circumstances in the years ahead, and to do so in a context of fair and evenhanded treatment of competing depository institutions. That seems to me a practicable, achievable objective in this Congressional session. I am greatly encouraged by the convergence of views among affected institutions—what has seemed so controversial for years now approaches consensus. That in no small part reflects the responsible efforts of the leadership of this Association and individual bankers throughout the country.

In the weeks ahead, I welcome your efforts and your support—together with that of other affected institutions—in seeing this vital piece of legislation move through the Congress in acceptable form.

No industry in America plays a more pivotal role in our overall economic performance than our banks. Current developments underscore the point—but it will be true in the decades ahead as it is today. The implied responsibilities are heavy. But seldom are we offered the opportunity to meet a major immediate challenge to our prosperity and stability, while at virtually the same time strengthening the base we need for effective policy in the decades ahead.We can afford to do no less than rise to those challenges. ■

CONTROLLING MONEY WITH BANK RESERVES

The Federal Reserve on October 6 decided to curb money growth by seeking to control the amount of reserves directly rather than through a precise interest rate target. Controlling money with bank reserves has a long and rich history of research, experimentation, and discussion, both within the Federal Reserve and outside. This Bank's April 1973 Review carried a lively article on this topic, directed at the nonprofessional reader. Here are excerpts that are still perfectly germane.

by William N. Cox

"The Fed *somehow* does *something* to bank reserves, which *somehow* makes the banks do *something* to bank deposits, which *somehow* have *something* to do with the money stock."

A vague statement. But an accurate statement, perhaps, of the vagueness with which many citizens view the mechanics of Federal Reserve operations. Yet the mechanics of what happens and why is important, because no one can really understand or criticize Fed policy unless he has a common-sense grasp of how it operates.

The purpose of this article, therefore, is expository: to see, first, how the Federal Reserve's operations on bank reserves serve to control the total of deposits held at commercial banks and to see, second, how control of those total deposits relates to control of the money stock. Our purpose is to fill in those "somethings" and "somehows."

CONTROLLING "WIDGET" PRODUCTION

To understand what sort of system the Fed uses to control total bank deposits, let's use a hypothetical product and call it a widget. All we have to imagine about widgets is that thousands of widgetmakers produce and sell millions of them every year and make a profit doing it.

Suppose, now, that for some reason the Federal Government wanted to control widget production at a rate of 500,000 per

month. Quite aside from whether this would be a good idea or not, how could such control be accomplished? There are lots of ways, perhaps, but our interest is in one that would work like this: First, the government would print Widget Production Permits. Each would say:

> *This permit entitles the holder to produce five widgets per month. Production of widgets without this permission is expressly prohibited.*

Then the government would distribute 100,000 permits among widget producers. If each permit allowed the production of five widgets a month, then the 100,000 permits would impose a monthly production ceiling of 500,000 widgets.

Would the permit system work to control widget production? Three conditions would have to be satisfied. First, nobody but the government could issue the permits. (Successful counterfeiting, for instance, would beat the system.) Second, the government would have to be able to enforce the 5-to-1 ratio between widgets produced and permits held. (If a widgetmaker were able to produce without permits, the scheme would limit authorized production but leave actual production unaffected.)

Third, the government would have to depend on competition for profits among the widgetmakers to ensure that actual production did not fall short of the 500,000 ceiling. (If widgetmakers found it profitable to produce only 200,000 widgets a month, then the permit system would merely impose a meaningless ceiling on production without *controlling* it.)

Apparently, then, such a permit system would work to control total widget production only if the government could control the number of permits, only if the prescribed ratio between permits and production could be enforced, and only if competition for profits impelled widgetmakers to produce up to the permit-set ceiling.

From Widgets to Bank Deposits. The widget-control scheme parallels the system employed by the Federal Reserve to control total bank deposits. Bank deposits are our widgets, commercial banks are our widgetmakers, and bank reserves are our Widget Production Permits. We can verify that the system should work by checking the banking analogies of the three requirements for effective control.

Bank reserves themselves, for the most part, are checking account balances held *by* commercial banks *at* their regional Federal Reserve Banks. Since the Fed keeps the books, there is no way to counterfeit our "permits." So for now, at least, we can assume the first requirement is satisfied. The second requirement for workability, enforcement of the ratio between the reserves held by the banks and the deposits their customers hold with them, is assured by traditional surveillance and examination of banks' activities. Since these first two conditions are met, the Fed's system should impose a ceiling on the total amount of bank deposits. In fact, it does.[1]

As to the third question, whether limiting the total of deposits is tantamount to controlling that total, it does appear that competition for profits among commercial banks operates to keep the actual deposit total very close to its limit. In practice then, setting a ceiling on total deposits operates to control the total.[2]

Basically, then, the Fed can limit the total of bank deposits (1) by limiting the amount of customer deposits an individual bank can hold for each dollar of reserves held by the bank, and (2) by controlling the total amount of reserves

---

[1]Until the 1930's, reserves were not viewed as a deposit-control tool. When the Federal Reserve was established in 1914, reserve balances at the Fed were intended to provide each bank with a backup stock of funds. Much like the savings an individual might put aside for a rainy day, these deposits at the Fed were "reserved" for unforeseen contingencies.

[2]Commercial banks add to the overall amount of bank deposits when they make loans, which they do by accepting a borrower's promise to repay and simultaneously crediting additional funds to the borrower's checking account. Normally, a bank will continue to make additional loans and add to the overall level of deposits as long as the interest the borrower pays on the loan exceeds the bank's costs in making it. Costs would include whatever interest the bank itself would have to pay for funds it borrows, plus allowances for administrative overhead and for assuming the risks of lending.

available to banks for permitting the deposits. Competition among the banks themselves normally keeps total deposits close to the reserve-set limit, so that the power to limit is, in practice, the power to control the national deposit level.

SEVEN IMPORTANT FEATURES

Now let us abandon the widget and extend our discussion to several important features of the deposit-control system. The seven features described below have been selected to flesh out our description of the tools and framework through which Fed policy exerts its influence.

First, notice that the system we described permits the Fed virtually no control over the distribution of deposits *among* commercial banks. Reserves only serve to control the total. Banks compete with each other, subject to supervisory ground rules, to divide the total among themselves.

Second, we can see the reserve system, by enabling the Fed to control the level of total deposits, automatically empowers the Fed to *change* that level as an act of policy. The Fed can move to increase or decrease the deposit limits on the banking system by acting to increase or diminish the reserve account balances commercial banks hold at the Fed. (The process is trickier than it looks, however, as we shall shortly see.) To decide what policy actions to take and what changes to make in the amount of reserves available, top Fed officials meet each month as the Federal Open Market Committee, the Fed's forum for monetary policy.

Third, let us ask just *how* the Fed acts to increase or decrease the supply of reserves available to commercial banks. Reserves, remember, are deposit balances held by commercial banks at the 12 regional Federal Reserve Banks. To increase the total amount of these reserve balances, all the Fed has to do is . . . buy something. Buy anything, in fact, as long as payment is made with a check drawn on a Federal Reserve Bank. What happens, in effect, is that the seller deposits the Fed's check with his commercial bank, and his bank deposits it with the Fed for credit to its reserve account. To decrease the reserve total, on the other hand, all the Fed has to do is sell something, as long as the Fed takes payment for what it sells by reducing its reserve account obligation to a commerical bank.

Buy what? Sell what? Anything, in theory, just as long as the payment is eventually credited to or deducted from a commercial bank's reserve account at the Fed. When the Fed buys a computer or pays an economist, for example, total bank reserves increase. More realistically, though, the only market large and efficient enough to handle the Fed's purchases and sales is the "open market" for government securities.[3]

A fourth feature is that the limitation on total deposits can also be changed without open market purchases or sales by the Fed. Instead of changing the amount of reserves available to the banks, the Fed can simply change the amount of deposits each dollar of reserves will permit. This is what happens when the Fed changes reserve requirement ratios. If the ratio is initially 6-to-1, then each dollar of reserve balances permits the issue of six dollars in deposits. But if the ratio is changed to 7-to-1, each reserve dollar permits seven deposit dollars, thereby raising the total deposit limit to seven-sixths of the former level.[4] In practice, the Fed does not change reserve-to-deposit ratios very often, preferring the alternative of changing the amount of reserves with open market operations.

A fifth feature of the reserve-control system is that banks can borrow reserves directly and temporarily from the Fed. This takes place through the so-called discount window. Banks whose applications are approved pay the discount rate,

---

[3]The open market is where already-issued government securities are traded by investors, hence the term "open market operations." See "What Are Open Market Operations?", Harry Brandt, **Monthly Review,** May 1960 (revised March 1972). Reprinted in **Federal Reserve Policymaking and Its Problems,** 2nd ed., Number VII (Readings in Southern Finance, Atlanta, Federal Reserve Bank of Atlanta, November 1972), p. 30.

[4]The ratios are often expressed, equivalently, as percentage reserve requirements. A 10-to-1 ratio implies a 10-percent reserve requirement; a 5-to-1 ratio implies a 20-percent reserve requirement, etc.

a Fed-set interest rate which has also come to be viewed by the public as a gauge of the Fed's determination to hold down or encourage up bank deposit levels.[5]

Another means of giving banks temporary flexibility in meeting their reserve requirements was inaugurated in 1968: since then banks have been allowed to carry forward up to 2 percent of their reserve excesses or deficiencies into the subsequent reserve-computation period.

Sixth, we can note that banks normally try to hold a few extra reserves at the Fed in excess of the amounts required by the deposit levels they report. Banks often lend their excess balances to other banks overnight in the market for Federal Reserve balances—the Fed funds market, for short. Banks looking for reserves bid among each other for use of other banks' excess reserve balances, and the interest rate that emerges from each day's bidding is called the Federal funds rate. This rate is a sensitive reflection of how much pressure, if any, there is between the banks' determination to expand their deposits and profits, on the one hand, and the Fed's determination to limit such expansion, on the other.

Seventh and finally, it is important to realize that banks use reserve balances to settle debts among themselves. Traffic is heavy, since commercial banks are constantly taking credit for checks deposited with them and crediting other banks for checks written by their own customers. Banks also consummate their Federal funds transactions by asking the Fed to transfer reserves. A commercial bank's reserve balance is almost continuously changing in reflection of debits and credits resulting from thousands of banking transactions. This complicates the banker's job of keeping enough reserve balances at the Fed to permit the deposits held at his bank and explains why the discount window and the Fed funds market are often useful.

SOME FRUSTRATING COMPLICATIONS

The Fed's system for using bank reserves to control total bank deposits, though simple in concept, encounters some frustrating complications in practice. This section discusses four of them.

The first follows from the facts that all bank deposits are not the same and that all deposits do not carry the same deposit-to-reserve ratio. Commercial banks issue deposits with diverse characteristics: checking account balances available on demand and paying no interest, interest-bearing savings account balances, and fixed-maturity certificates of deposit, for example. All of these deposit forms are bank liabilities and each, as it happens, is subject to a numerically different deposit-to-reserve ratio. Current regulations, moreover, require larger banks to hold more reserves per dollar of deposits than smaller banks.[6] So all deposits are not the same, and the same reserve ratio does not apply to all deposits.

This proliferation of deposit types and reserve-to-deposit ratios complicates the reserve-control system. If the Fed wants the banks to issue more demand deposits and decides to supply additional reserve balances through open market operations to permit the additional demand deposits, for example, then Fed policymakers have to guess how many of the additional reserves will be used by the banks for additional demand deposits and how many will be used for additions of other deposit types. (We shall return to this example in the next section.)

A second, somewhat different complication is that various hard-to-predict events operate on their own to increase or decrease the total amount of reserves available. It is almost as if a tribe of gremlins were capriciously stealing and replacing each bank's stock of reserves, shifting the reserve total up and down in the process.

---

[5]See "The Discount Rate: Problems and Remedies," **Monthly Review,** June 1972. Also, "Member Bank Borrowing: Process and Experience," Arnold A. Dill, **Monthly Review,** April 1973.

[6]To further complicate matters, there are other "nondeposit liabilities" of banks which must also be backed by reserves, as, for example, Eurodollar liabilities.

One reason this happens is that banks can count the currency and coin they hold in their vaults as reserves. Putting the details aside, the result is that total reserves change every time a bank customer deposits currency or cashes a check at a teller's window. Essentially the same result occurs every time the U. S. Treasury or a foreign central bank shifts deposits between a commercial bank and a Federal Reserve Bank.

Biggest Gremlin: The Fed Float. The biggest gremlin of all, though, arises from what bankers call Fed float. Banks use the Fed to clear checks, as we said, crediting the reserve account of a bank which submits a check with a delay estimated to equal the time it will take to collect the check (by deducting reserves from another bank). When the estimate is poor, so that the deduction and the credit fail to coincide, Fed float results. This Fed float varies from day to day, as when a snowstorm delays the physical shipment of checks from a major city, thereby delaying the collection of those checks in other cities. As it varies, so does the total of reserves available.

We call gremlins like these market factors. The Fed works hard to predict how these factors will shift and tries to offset their effects by buying or selling government securities. (This, in fact, is what impels the Fed to engage in a large dollar volume of open market operations almost every day. If the problem were simply to add a few reserves every month to allow for gradual growth in the economy's need for deposits, then the Fed could probably get by with a single security purchase each week.)

A third operational complication surfaces when one considers that thousands of banks hold reserve balances at the Fed. It is a big job just to add up how many deposits each bank holds in each reserve-ratio category. With the banks' cooperation, an elaborate deposit tabulation and accounting system has been built and is constantly being improved. Even with this, though, a bank itself is often unsure of its deposit totals until the following day or thereafter. This is perhaps the main reason why reserve balances and deposit totals are matched up on a weekly average basis rather than daily.[7]

A final complication, here at least, is that only four out of ten commercial banks are members of the Federal Reserve System. Only about 40 percent of U. S. banks, therefore, are subject to the direct influence of the Fed's reserve system. (Nonmember banks must conform to alternative reserve requirements established by state laws.) Fortunately, however, member banks account for about 80 percent of U. S. bank deposits.

These are some of the headaches—there are many others—which the Fed encounters as it tries to use the bank reserve system to limit total bank deposits. Although the scheme is conceptually so simple it seems as though it would have to work, perhaps in practice the surprising thing is that it works at all.

A BRIEF SUMMARY

The reader who has stuck with us should now have a feel for how reserves are used as the basic tool of monetary policy. We have seen how reserves can effectively limit total deposits. We have seen how this limitation approximates control but says nothing about the distribution of deposits among banks. We have seen how the Fed's open market operations and reserve requirements changes work and how the Federal funds market and the discount window fit into the larger scheme. We have also explored the nature of some of the practical complications faced by the Fed as it attempts to employ the basic deposit-limitation scheme. Other, more subtle complications confront the Fed as well, but they are beyond the scope of this article. Perhaps, however, the mysterious "somethings" and "somehows" are now a little less mysterious. ■

---

[7]The reserve statement period is a seven-day week, Thursday through Wednesday, over which banks must hold enough reserve balances, on average, to meet the requirements implied by their deposit levels reported two weeks previously.

HOW BAD WILL IT BE?

TRACKING THE ECONOMIC STORM

How does the puzzling "recession of 1979" compare with the last few recessions? Where will the worst downturns come? Past patterns provide clues to what will happen this time, and suggest why the Southeast will likely fare better than the rest of the nation.

This article is based on material contributed by Federal Reserve Bank of Atlanta economists William N. Cox, John M. Godfrey, Charles J. Haulk, and Gene D. Sullivan.

Predicting the course of a recession is something like predicting the path of a hurricane. There will always be surprises. Most forecasters were surprised by the Federal Reserve announcements of October 6, for example. The policies announced there for the purpose of curbing inflation have caused most forecasters to lower their predictions of economic growth. Yet even with such surprises, there is still a good deal to be learned by tracking this economic storm against its predecessors.

The signs are mixed this time, but they suggest that the 1979 recession will be milder nationally than the 1973-74 experience and that the Southeast will fare better—partly because the construction situation is not nearly so vulnerable this time and partly because the slowdown is superimposed on the longer run shift to the Sun Belt.

To track the probable course of the storm, we examined three major categories of economic activity (economic indicators, inflation, and financial data) and compared their recent behavior with the pattern of the last four recessions. After several indicators took "recession-like" downturns in 1979's second quarter, some indicators rebounded strongly in the third quarter. As a result, there is no consensus among economists as to exactly when the recession began. For the purpose of this article, however, it is assumed to have started in the second quarter of 1979. This comparison should provide a basis for some tentative conclusions about the direction of the recession.

OBSERVING THE STORM FROM THREE ANGLES

Some economic indicators look worse than usual. In past recessions, housing has been one of the first sectors to turn down. Chart 1 shows that the decline in residential investment typically begins four quarters before the "official" start of the

All charts in this article *assume* that the recession of 1979 began in the second quarter. Although some recent evidence shows an atypical rebound in 1979's third quarter, these charts still reveal useful comparisons with past recessionary patterns. Since some charts are, by necessity, drawn to different scales, the reader should compare the current experience with past recessions within each chart, ignoring differences in scale between charts. The vertical gray band represents the onset of recession. The left of the band shows conditions in quarters or months preceding the onset. To the right is what happened in successive quarters or months "into" the recession.

The solid black line in each chart shows the composite pattern of either three or four previous recessions (since 1957) in either index (Charts 1-5, 13, and 14) or percentage (Charts 6-12) form. The red line represents movements for the 1979 experience.

recession and drops 12 percent in that pre-recession year. This time, housing peaked only two quarters before the onset of the recession. This could mean either that (1) the housing decline could be more shallow than usual or (2) it could be comparable to other recessions but later than usual. In either case, housing could be a retardant to growth for several quarters.

The second indicator—consumer durable goods expenditures in real terms—typically peaks three quarters prior to the recession start. Chart 2 shows that this time the lead was only two quarters. If this recession follows the historical pattern, durable goods sales will continue to fall for several quarters, significantly suppressing total economic activity. On the other hand, since the decline *has been sharper than usual,* much of the total adjustment may have already occurred. Third quarter strength tends to confirm a rebound.

The black line in Chart 3—the ratio of manufacturing and trade inventories to sales (measured in 1972 dollars)—describes the typical rise of this ratio in the year preceding the recession and a continued rise (based on declining sales, not additional inventory accumulation) for at least another three quarters. This pattern appears to be holding true for the current recession, so we can expect a continued rise in inventories to sales until production cutbacks begin to halt further accumulation.

Consumer confidence, our fourth indicator, has fallen rapidly this time, much more steeply than the composite pattern (Chart 4). If the confidence index (derived from a survey of consumers' buying plans and attitudes toward business conditions) is any guide at all to future consumer behavior, we can look for a great deal of retrenching by consumers.

The weak picture for consumer confidence is reinforced by the personal savings rate ("savings" is what is not spent out of current income) in Chart 5. In a typical recession, the savings rate would remain above the level existing when the recession began. The 1979 third quarter 25-percent drop diverges radically from the historical precedent, but it is consistent with the abnormal rise in durable goods expenditures.

Housing, consumer confidence, and personal savings are behaving somewhat abnormally. Housing, which has been supported by rapid money growth and financial innovations, may not be able to avoid a substantial downward adjustment (in line with previous recessions). Consumer confidence, already dropping fast, could fall even further. The precipitous drop in personal savings is probably due to expectations of continued inflation. People are buying instead of saving. But if consumers begin to fear recession more than inflation, we should see a substantial upward movement in the savings rate, which means a sharp decline in consumer purchasing. Through the third quarter, however, that has not yet happened.

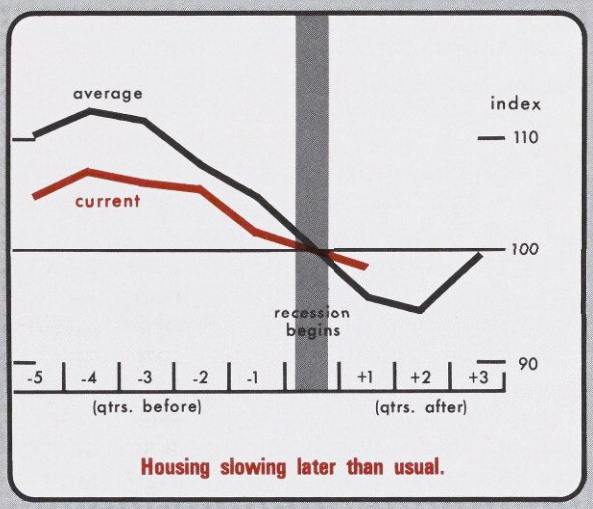
These two divergences from the historical pattern make the course of this recession difficult to predict, but their combined impact could make for a recession at least as bad as the average recession since 1957.

Will the recession help reduce inflation? Eventually, yes. Usually, when the economy goes into a recession, some workers begin to lose their jobs, others have cutbacks in working hours, and new labor force entrants have greater difficulty in finding employment. The combined effect is a reduction in the growth rate, if

economic indicators

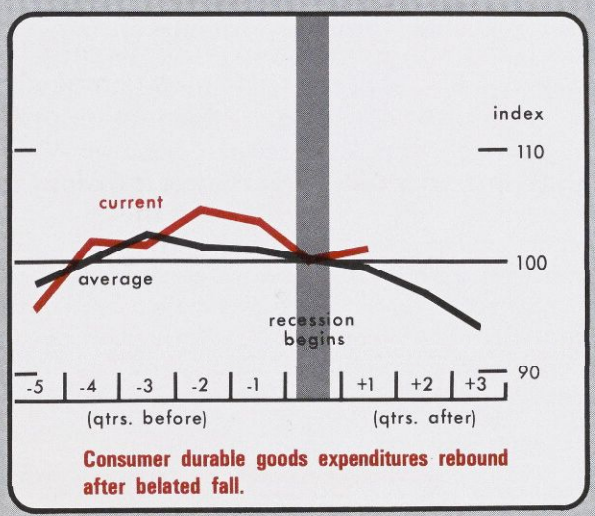
Black line indicates average of last four recessionary periods (1957-58, 1960-61, 1970, 1973-75).

1. RESIDENTIAL FIXED INVESTMENT



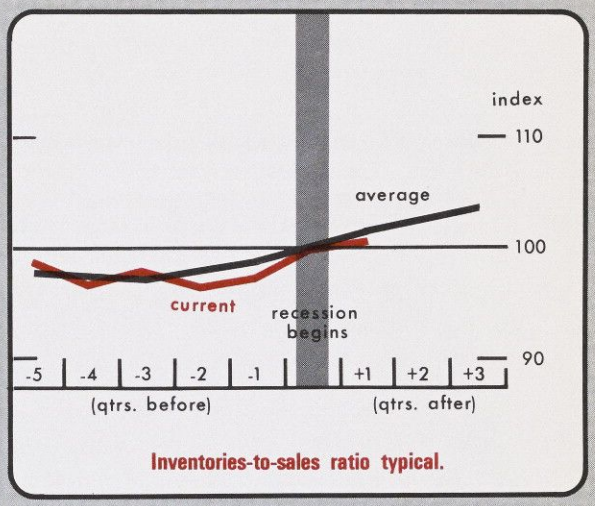
Housing slowing later than usual.

2. CONSUMER DURABLE GOODS EXPENDITURES



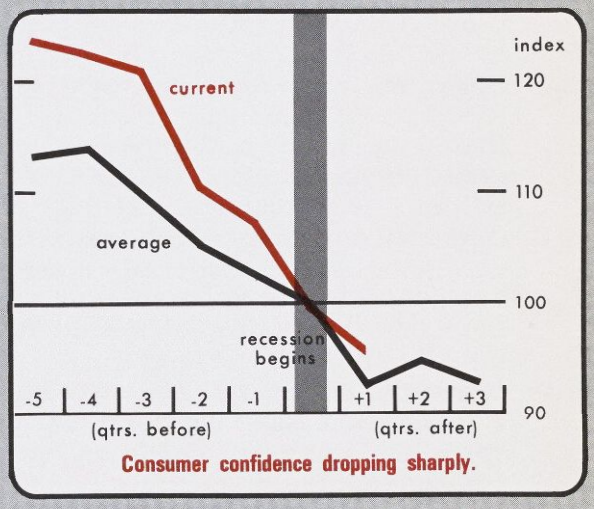
Consumer durable goods expenditures rebound after belated fall.

3. RATIO OF INVENTORIES TO SALES, MANUFACTURING AND TRADE



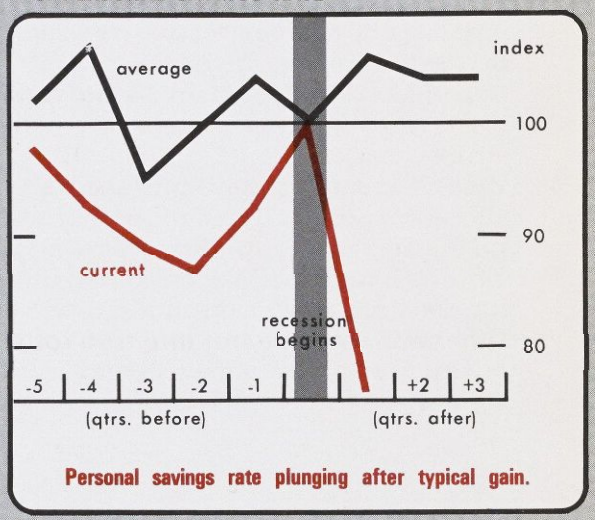
Inventories-to-sales ratio typical.

4. CONSUMER CONFIDENCE



Consumer confidence dropping sharply.

5. PERSONAL SAVINGS RATE



Personal savings rate plunging after typical gain.

not the actual level, of personal income. Consumers, increasingly cautious during these periods, reduce their demand for goods and services. This reduced demand may cause prices to fall as sellers offer discounts in attempts to stimulate faltering sales (not unlike what has happened to markets for large cars). Therefore, it is reasonable to expect a recession to be accompanied by some progress in the battle against inflation. Some people, in fact, view recession as the "bitter medicine" that is necessary to bring inflation under control.

How much inflation relief have past recessions actually produced? And how soon did those improvements appear after the recession began? Chart 6 answers these questions and also provides graphic evidence of the abrupt increase in the inflation rate during the 1973-75 period and the even sharper climb in 1979. The chart shows that price increases have generally slowed within two or three quarters after the onset of recessionary periods. Prices themselves have not declined, of course, only their rate of increase. The chart's bottom line, depicting the average of three earlier recessions, shows some abatement in the rate of price increases two quarters prior to the recession, but the rate does not drop off decidedly until the third quarter after the onset of recession.

An unsettling exception to the pattern appeared during the 1973-75 recession. Unlike the three previous experiences, prices continued to rise at an increasingly rapid rate until the first quarter following the recession's onset and did not begin to abate until four quarters later. By the sixth quarter following the onset, the rate began to stabilize at a much higher level than had been experienced following previous recessions.

The top line in Chart 6, showing the 1979 experience, begins from a sustained high level of inflation that followed the 1973-75 recession. The rapid rise during the fourth quarter before the onset was stimulated by the jump in food costs following the crop-damaging freezes in early 1978. The renewed rise in the rate of increase in the quarter immediately preceding the recession was primarily due to the mid-1979 upsurge in meat and gasoline prices.

The encouraging news is that preliminary data for 1979's third quarter indicate that a flattening in the rate of price increases may be occurring. If we continue to follow the pattern of the last recession, however, it will be another three quarters, or well into 1980, before the rate of increase subsides appreciably.

If inflation finally slows down, where will the decline be most pronounced? Four major sectors (food, lumber, textiles, and fuels) have paced the slowdown in prices in the past. This time around, that slowdown is coming later than usual (more like the 1973-75 recession). Chart 7 shows that food price increases were among the first to let up in past recessions. In our current experience, they have trended downward, but the movements have been more erratic than usual.

Producers' prices of lumber and wood products (Chart 8) actually declined in the third quarter prior to previous recessions; they were a source of substantial price relief four quarters after the onset in 1973-75.[1] In 1979, the pattern is not so encouraging. The rate of increase has been stable from fourth quarter 1978 through second quarter 1979, but recent data indicate that some abatement of inflation in lumber prices may be on the way. If construction does not falter as badly as it did in 1973-75, lumber prices are likely to chart a new course during the current recession.

Chart 9, textile products and apparel, is inconclusive. Typically, the rate of increase begins to abate by the quarter just prior to the recession's onset and goes on to register actual price declines. Last time around, this price downturn did not occur until one year following the recession's

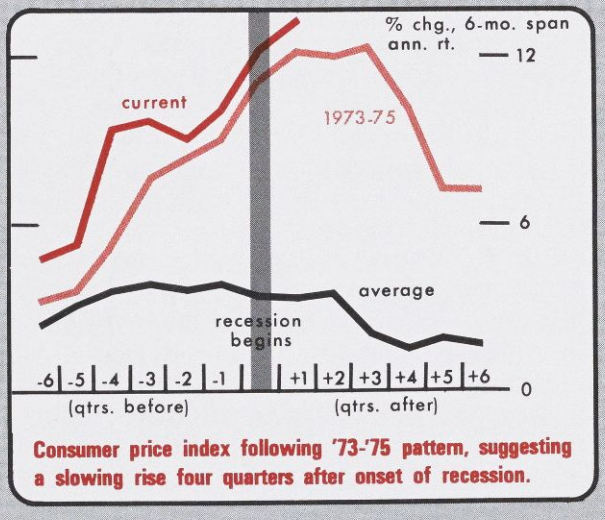
---

[1]Chart 8 shifts from consumer prices to producers' prices because of the prices for particular product groupings that were available at the producer level. Price changes at the producer level generally lead consumer price changes by one to two months.

inflation

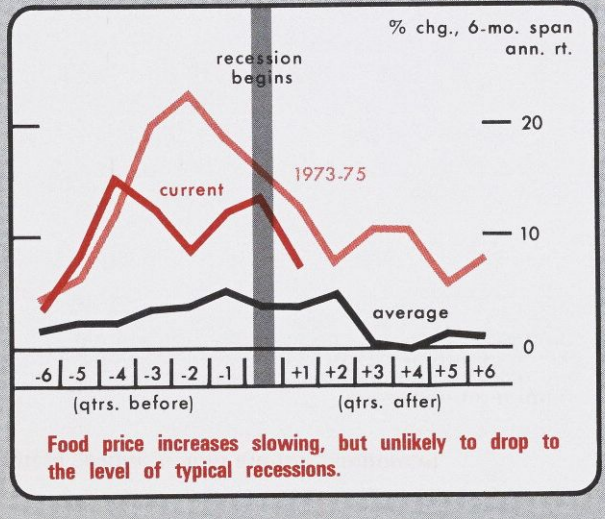
Black line indicates average of three recessionary periods (1957-58, 1960-61, 1970).

6. CONSUMER PRICE INDEX, ALL ITEMS



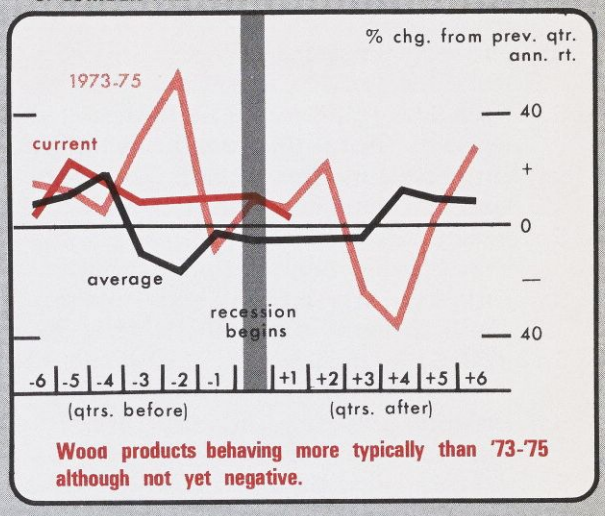
Consumer price index following '73-'75 pattern, suggesting a slowing rise four quarters after onset of recession.

7. CONSUMER PRICE INDEX, FOOD



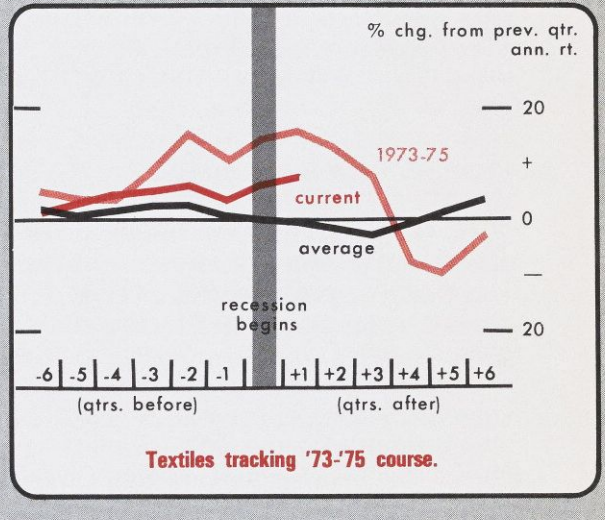
Food price increases slowing, but unlikely to drop to the level of typical recessions.

8. LUMBER AND WOOD PRODUCTS PRICES



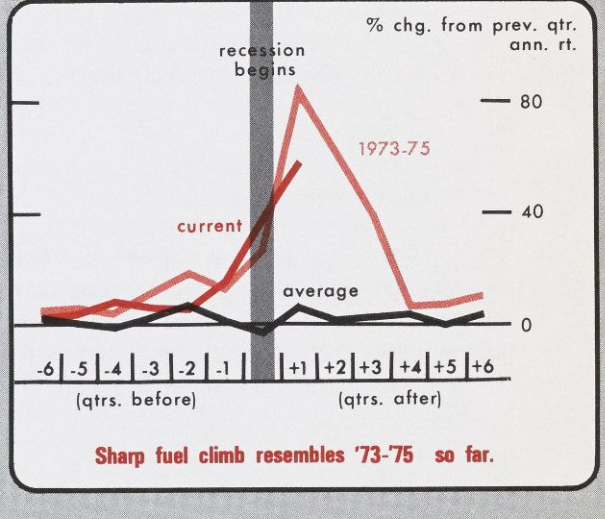
Wood products behaving more typically than '73-'75 although not yet negative.

9. TEXTILE PRODUCTS AND APPAREL PRICES



Textiles tracking '73-'75 course.

10. FUELS AND RELATED PRODUCTS AND POWER PRICES



Sharp fuel climb resembles '73-'75 so far.

onset. Some slackening has occurred in 1979, but it is too early to tell whether this sector will follow the 1973-75 pattern.

The oil embargo during 1973-75 produced vastly atypical performances for fuels and related products (Chart 10). Price increases approached an annual rate of 90 percent at the peak. Thus far in 1979, fuel price behavior has been uncomfortably like the early 1973-75 experience. In the recession's first quarter this time, prices were still rising with increasing rapidity. Even if the rate of gain slows a bit in the fourth quarter of 1979, recent price increases by OPEC countries raise doubts about hopes for stable oil prices in coming months.

Charts 6-10 show that, in the past, recessions usually have helped to reduce inflation. Actual price downturns, to be sure, have been limited to a few major products—some foods, lumber, and textiles. So far in 1979, however, our experience continues to resemble the 1973-74 period, which suggests that, if recent trends hold, we can expect some reduction in inflation but not before the middle of 1980.

Tracking a storm from different vantage points can produce different outlooks, and the financial statistics diverge slightly from the track suggested by the economic indicators. Chart 11 shows the M_1 definition of the money supply (bank demand deposits and currency) in terms of annual percentage rate changes. In the last four recessions, the growth rate of M_1, on average, has declined for four quarters prior to the onset of the recession.

During the five quarters preceding the current recession, the money supply has also declined but, uncharacteristically, has rebounded sharply. In fact, Chart 11 shows that money supply growth for the quarter following the onset of the recession (in this case, the third quarter of 1979) reached 9.5 percent.

The M_1 pattern, however, is somewhat deceptive. The sharp drop in the quarter immediately preceding the recession should be adjusted upward for the November 1 introduction of the automatic transfer of funds from savings to checking accounts and the introduction of NOW accounts in New York. These adjustments would increase the growth in the fourth quarter of 1978 and in the quarter preceding the recession. Still, however, it is clear that M_1 grew much more rapidly in the *third quarter* of 1979 than it did during the average of the past recessions. The implication is that, to the extent that money supply growth determines future inflation rates, the strong growth in the second and third quarters of 1979 may limit the relief from inflation which typically occurs as the economy moves into a recession.

The M_2 definition of the money supply (M_1 plus bank time and savings deposits, except for large-denomination CDs) exhibits much the same pattern as the M_1. Chart 12 reveals a noticeable slowdown in the average growth of this aggregate prior to the beginning of the average recession. In addition to this decline, banks have typically suffered substantial disintermediation (shifts of consumer funds from banks to higher yielding open market securities) during past recessions. The current trend also shows a sharp slowdown in the growth of M_2 but a strong rebound in the recession quarter and the following quarter. Like the growth in M_1, this aggregate may be signaling only a mild recession, with little relief from inflationary pressures.

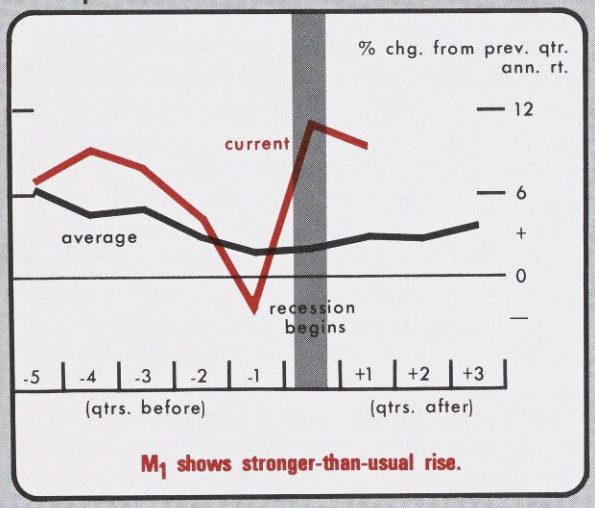
Another key financial variable which may shed light on the current recession is total bank loans (Chart 13). The thick black line in Chart 13 describes the average trend of bank loans for the year preceding the recession and the year following the recession. The total at the onset of each recession equals 100 percent on this chart. Typically, bank loans have risen about 10 percent in the year immediately preceding the recession, shown very little growth as the economy has moved into the recession, and then risen about 5 percent in the year after the onset.

In 1973, however, this pattern changed significantly. Total bank loans rose some 15 percent in the year preceding the onset of the recession (November 1973) and continued to rise strongly for almost a

financial data

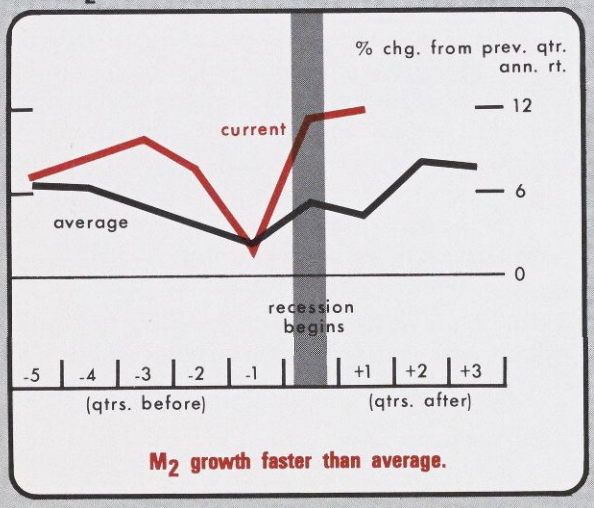
Black line indicates average of two recessionary periods (1960-61, 1970).

11. M_1



M_1 shows stronger-than-usual rise.

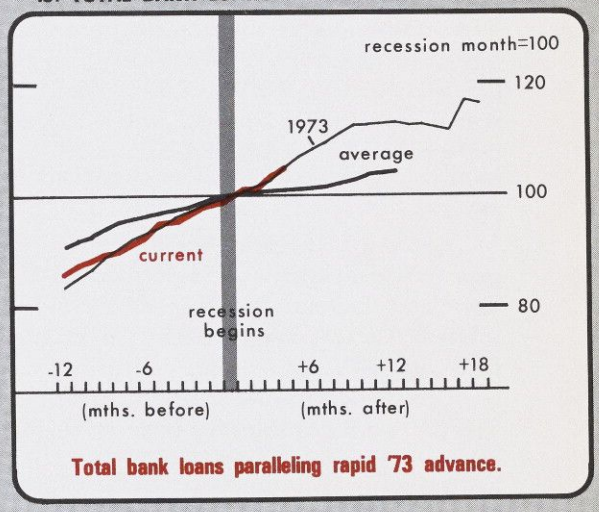
12. M_2



M_2 growth faster than average.

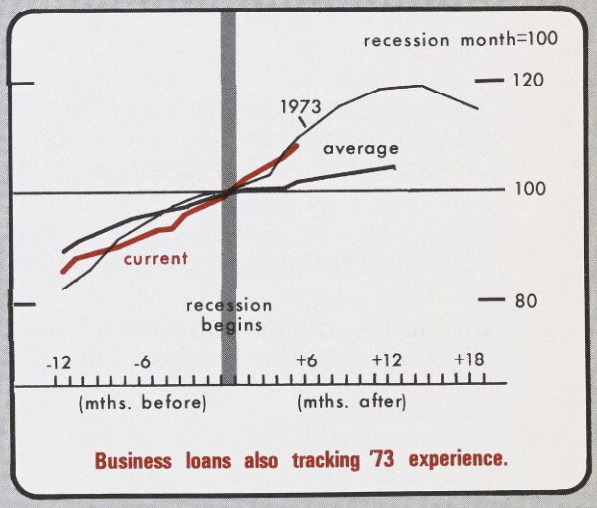
Black line indicates average of last four recessionary periods (1957-58, 1960-61, 1970, 1973-75).

13. TOTAL BANK LOANS



Total bank loans paralleling rapid '73 advance.

14. BUSINESS LOANS



Business loans also tracking '73 experience.

year thereafter, when they finally began to slow down. This atypical pattern was probably the result of consumers and businesses having to finance purchases and inventories at higher prices, which meant that even to finance the same volume of real goods would require more bank credit. As you can see, the 1979 pattern approximates 1973 more than it does the typical recession.

One reason for this continued expansion of loans is that banks have increased options in obtaining deposits and other funds. Their ability to issue large denomination certificates of deposit free of interest rate ceilings has attracted sizable amounts of funds. Since May 1978, money market certificates and other financial innovations have enabled banks to attract funds and, hence, to continue lending under conditions that previously would have caused them to curtail new loans.

Business loans followed much the same pattern as total bank loans. Again, 1973 was an exception to this pattern, as business loans advanced nearly 17 percent preceding the recession and another 20 percent after the onset. Not until early 1975, 13 months into the recession, did business lending slump sharply. The unusual continued strength of business borrowings in 1973-74 was partly because businessmen were forced to finance (often unwanted) inventories at increasingly higher prices and thus needed more and more credit. Chart 14 shows that the 1979 pattern is much closer to that of 1973 than to earlier periods. As unwanted inventories pile up, businessmen typically turn to banks and banks make more business loans as long as funds are available.

At present, the financial data, like the inflation charts, suggest a milder downturn than do our other economic indicators. If the monetary aggregates continue to expand rapidly, the slowdown may be milder than many people expect, with correspondingly little relief from inflationary pressures. However, in light of the Federal Reserve's October 6 policy changes, reduced monetary growth seems much more likely.

ADDING IT ALL UP

As happens so often with hurricanes and economics, our storm track stations do not all see the same signs. Some of the economic indicators, especially consumer confidence and consumer savings, suggest that we are in for a worse-than-average recession. Others—construction and durable goods sales—indicate an average downturn, only later than usual. Inflation is not following the typical pattern. So far, it more resembles the 1973 recession, when inflation relief came eventually but somewhat later and less substantially than usual. The most recent financial information—monetary aggregates and bank loans—indicated a milder-than-usual downturn prior to October 6, with a correspondingly small slowdown in inflation.

The Federal Reserve's October 6 policies, and the concerns evidenced by them, point to reduced money and loan growth and, hence, to reduced economic growth, reduced inflation, and a stronger dollar.

Taking all the indicators together, we can discern four central characteristics of the situation. First, recent movements in economic variables *generally* resemble the patterns of previous recessions. Second, the recession probably will produce some inflation relief but not until 1980. Third, the typical recessionary slowdown in the monetary aggregates has not yet materialized (as of mid-October). Fourth, a typical recession sees a rapid increase in bank loans, and the 1979 pattern is no exception.

Whatever the storm's degree of severity, we can expect the Southeast to get off easier than other parts of the country. Since World War II, the Southeast has usually had much lighter recessions than the nation as a whole , sometimes not even noticeable ones. The biggest single factor in our "umbrella" has been the mix of jobs and production, especially our low proportion of heavy industry—a large component of recessionary swings.

In 1974-75, however, our umbrella collapsed and the Southeast got soaked—thanks to faster growth which led to a

higher proportion of construction, overbuilding, and financial overextension. This time, we appear to be better prepared. The energy crisis has pushed migration to the warmer climates even faster, thus fueling the District's economy. There is little evidence of financial overextension by builders and not much speculative building. Commercial building in some areas of the Southeast continues strong. But a strong commercial construction sector now could easily lead to a slower recovery. No large inventories of unsold homes exist in 1979. Even Florida, where building activity has been torrid, will probably suffer little damage from the recession because of low home inventories. The percentage of construction workers in the labor force is also lower in Florida than last time. The usury ceilings, which are slowing housing in some southeastern states, should have only temporary influence as floating rates adjust themselves to the post-October 6 environment. Although the recession's impact on the Southeast depends on the precise distribution of the drop among the sectors of the economy, the evidence suggests that this storm will strike the rest of the nation harder than it does the Southeast. ■

HOOKED ON OIL

by William N. Cox

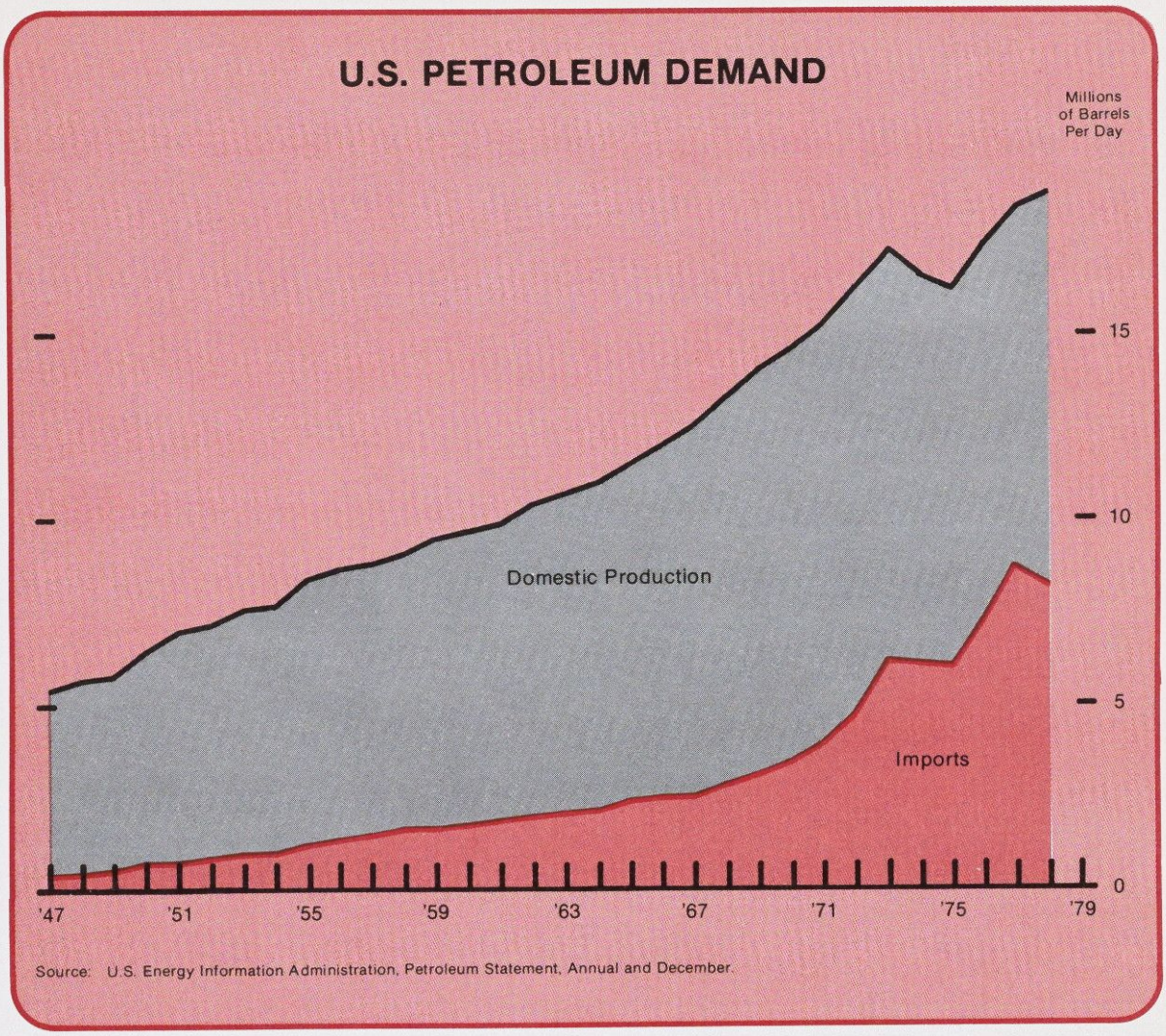
While debates on decontrol of oil prices and windfall profits taxes intensify, one fundamental and largely unforeseen development now seems inevitable: the U.S. will have to rely on foreign oil at least through the next decade. Optimistic predictions of "oil independence" are not working out, and alternative sources of energy cannot be made practicable quickly. Consequently, we must prepare for a decade of energy vulnerability.

"Energy," said William Blake in a simpler time, "is eternal delight." Today, it is our eternal dilemma. Many elements of the national energy discussion are hotly contested and unresolved. One particular aspect of the broader energy question, however, *is* becoming increasingly clear and urgent: Our economy is critically reliant on foreign oil and, therefore, vulnerable to interruption of oil imports. Furthermore, this reliance and vulnerability will probably remain through the 1980s. These facts will persist for years regardless of such decisions as decontrol and windfall profits taxes.

Energy Self-Sufficiency by the 1980s No Longer Seems Likely. Back in 1974, after OPEC quadrupled the world price of oil to $7 a barrel, a consensus emerged among the experts that U. S. oil production would increase substantially in response to higher prices. Our use of oil, meanwhile, would stabilize or even shrink as the new prices pushed users to use petroleum products more efficiently and to shift to alternative forms of energy, which would also become more available at higher prices. U. S. imports of foreign oil would decline and continue to decline as we produced more and used less. American energy self-sufficiency in the 1980s was generally viewed as a realistic goal.

Things obviously haven't worked out that way. Now, six years after the OPEC embargo:

- Oil is selling worldwide for over $20 per barrel, three times the 1974 price



U.S. oil usage (the black line) has continued to increase, while domestic production (the gray portion) has remained flat, leaving the additional demand to be filled by additional imports (red portion).

nominally and twice the 1974 price in real terms.

- U. S. imports in 1978 and 1979 are one-third *greater* than they were before the embargo. Almost half the oil we use is now foreign.
- U. S. oil production has not increased since 1973, even with the completion of the Alaskan pipeline.

A disappointing experience, to say the least. Out of it is coming a new consensus about our energy future: more sober, more realistic, almost certainly more reliable, and promising in the long run. The new consensus goes something like this:

First, American oil usage is not likely to decline for at least 10 years, provided the oil is available to use. Gains from more efficient usage of petroleum products will, at best, meet the additional requirements generated by economic growth.

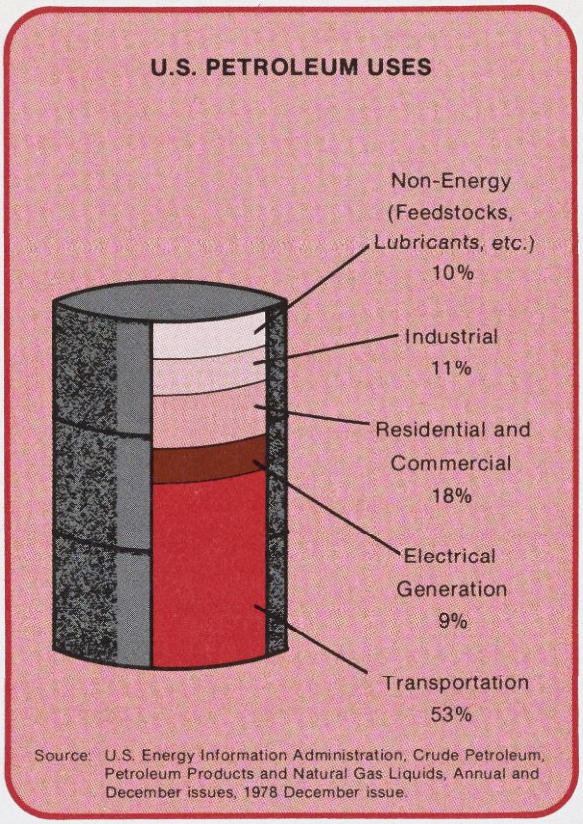
Decontrol of domestic oil prices, now under way, will help to restrain the growth of oil usage, but the results will not be dramatic or quick. The increases in gasoline prices resulting from decontrol of oil, for example, will be much less than the gasoline price increases already experienced since 1973. Yet domestic demand for gasoline has not declined.

Although more miles are being driven despite higher gasoline prices, other slower and more substantial reactions, which reflect basic changes in Americans' attitudes, are also taking effect: the higher prices are encouraging the demand for more efficient automobiles, the use of public transportation, the purchase of homes closer to work, and so forth. But the effects of such conservation measures on total usage will be gradual and slow.

Second, American oil production is not likely to increase much, if at all, beyond current levels. Earlier hopes that higher producer revenues (as, for example, from decontrol of prices or from a lower windfall tax rate) would provide substantial new domestic supplies have obviously been deflated. Despite substantial increases in domestic prices and the opening of Alaskan fields, U. S. oil production has been flat since about 1970. New domestic reserves are being found, proven, and tapped, certainly, but not as fast as existing reserves are being drained. Half the exploration crew activity and four-fifths of the wells drilled worldwide in 1977 were in the United States. Perhaps the most credible evidence of this is the oil company advertising about conservation. It is a little strange, when you think about it, for producers to be urging customers to buy less of their product. Strange, that is, unless supplies of that product will be limited.

Third, significant supplies of domestic substitutes for oil are not likely to be available during the 1980s. Each alternative has peculiar problems. Only 10 percent of our oil usage goes to generate electricity, so the oil-saving contribution of *coal* and *nuclear* fuels is thereby limited, quite aside from the environmental questions and from the problem of how to move coal from mine to generator.

Heavy oil, shale oil, tar sands, and enhanced recovery from conventional wells all involve technology untested on a large scale and uncertain in cost. Proponents of these supply alternatives discuss quantities small in relation to our 8 million barrels a day of oil imports, even after eight or ten years of development.



Where does our oil go?

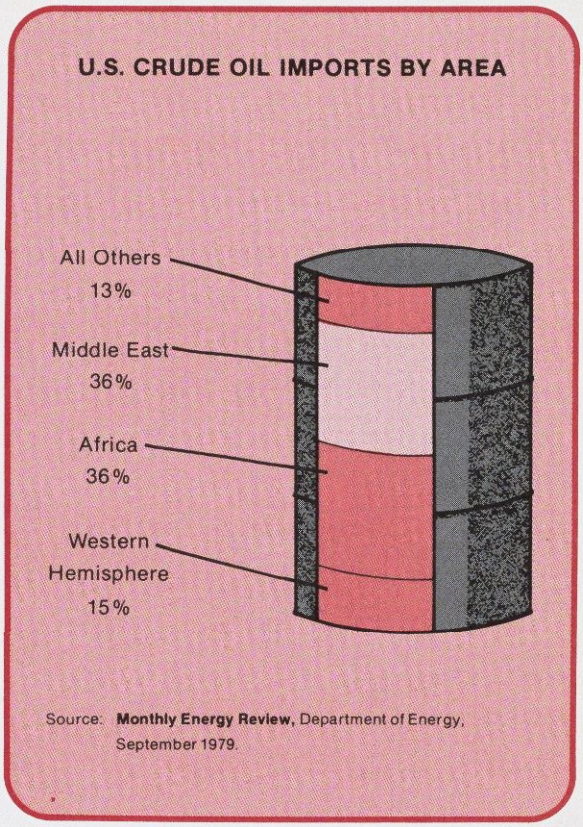
More than half our oil from all sources is consumed in transportation activities. About half of that goes to private automobiles. Electrical generation, in contrast, accounts for only about 10 percent of American petroleum consumption.

Additional domestic supplies of *natural gas* (as a substitute for oil in home heating) offer the most hope, once interstate gas pricing is fully deregulated. Expert opinions differ about how much natural gas will be recovered at higher prices or whether imported gas will be available to fill any shortfalls that persist. (Natural gas imports have up to now been small in relation to domestic gas use.)

Alcohol is more promising as a substitute for gasoline. Half of the U. S. oil usage is in transportation, of which half in turn is in gasoline burned by private automobiles. The technology for substituting alcohol for gasoline is proven, and additional agricultural resources are available. But as the Brazilians are finding, significant substitution of alcohol for gasoline takes years to implement.

Fourth, "technological breakthroughs" cannot quickly change our reliance on imported oil. We already have a great deal of useful, proven technology. Cars are in production and available, for example, which average 35 miles per gallon. Houses and factories are being built routinely with five to ten times the typical fuel efficiency for heating and cooling.

But just having technology available is not enough. Significant reductions in oil usage will not result until substantial proportions of the entire U. S. auto fleet have been upgraded for efficiency and until inefficient dwellings and factories are increased in efficiency. One 35-miles-per-gallon car will have no effect on oil use; 50 million such cars will obviously have an important effect. If the entire U. S. auto fleet could be magically converted to achieve 35 miles per gallon, for example, we would save about 3 million barrels of oil a day. If all those cars were fueled by 20 percent alcohol, we would save almost 2 million barrels a day (out of a 1979 average of about 8 million barrels a day of imported oil). But it will take years before more efficient cars, dwellings, and factories predominate. That is why so-called breakthroughs cannot quickly change the U. S. reliance on imported oil.



These simple and sobering likelihoods—that American oil usage will stay up, that American oil production may not, that oil substitutes will not be quickly and plentifully available, and that new technology will not change the situation soon—lead to the conclusion that *oil imports will remain a highly important source of energy through the 1980s.* During the first seven months of 1979, U. S. oil imports averaged 8.1 million barrels a day out of total usage of 18.8 million barrels. That rate held firm from 1978, when imports and usage averages were also 8.1 and 18.8 million. (Prior to rising oil prices in 1973, imports were 6.3 out of 17.3 million barrels a day.) Import levels will not retreat quickly from these levels as long as imported oil is available.

Will imported oil be available? There is obviously no assurance the answer will be yes. Import availability has slowed twice in the past six years (the 1973 embargo

and the Iranian stoppage in 1979). Our economy, clearly, is and will be critically reliant on the continued availability of imported petroleum. Such reliance is not a crisis in itself, but it makes our economy vulnerable to crisis whenever imports are interrupted. We are hooked on oil.

What can we do about this uncertainty and vulnerability? Certainly, the situation adds importance to our strategic petroleum reserve. By summer's end, the reserve held stocks equal to about 10 days of imports, far behind the reserves accumulated by the Japanese and European economies but growing substantially at last. The newly authorized reserve of six months' worth of oil imports in the ground, though expensive, will reduce our economy's vulnerability. Basically, though, there are no quick answers to the vulnerability which follows from our nation's reliance on imported oil. Conservation will help. Encouragement of alternate fuels will help. Stockpiles of oil will help. But none of these measures can eliminate our vulnerability quickly or totally. We are hooked on imported oil. ■

INDEX FOR 1979

WORKING PAPER SERIES:

Estimating Sixth District Consumer Spending
by Brian D. Dittenhafer

Changes in Seller Concentration in Banking Markets
by B. Frank King

Regional Impacts of Monetary and Fiscal Policies in the Postwar Period: Some Initial Tests
by William D. Toal

A Framework for Examining the Small, Open Regional Economy: An Application of the Macroeconomics of Open Systems
by Robert E. Keleher

Southern Banks and the Confederate Monetary Expansion
by John M. Godfrey

An Empirical Test of the Linked Oligopoly Theory: An Analysis of Florida Holding Companies
by David D. Whitehead

Regional Credit Market Integration: A Survey and Empirical Examination
by Robert E. Keleher

An Empirical Analysis of Sectoral Money Demand in the Southeast
by Stuart G. Hoffman

Entry, Exit, and Market Structure Change in Banking
by B. Frank King

Future Holding Company Lead Banks: Federal Reserve Standards and Record
by B. Frank King

Money-Income Causality at the State-Regional Level
by Robert E. Keleher and Charles J. Haulk

RESEARCH PAPER SERIES:

No. 1 Impact of Holding Company Affiliation on Bank Performance: A Case Study of Two Florida Multibank Holding Companies
by Stuart G. Hoffman

No. 2 Convenience and Needs: Holding Company Claims and Actions
by Joseph E. Rossman

No. 3 Small Banks and Monetary Control: Is Fed Membership Important?
by William N. Cox, III

No. 4 Component Ratio Estimation of the Money Multiplier
by Stuart G. Hoffman

No. 5 Holding Company Power and Market Performance: A New Index of Market Concentration
by David D. Whitehead

No. 6 Fundamental Determinants of Credit Volume: A Survey and Regional Application
by Robert E. Keleher

No. 7 State Usury Laws: A Survey and Application to the Tennessee Experience
by Robert E. Keleher

No. 9 Supply–Side Effects of Fiscal Policy: Some Preliminary Hypotheses
by Robert E. Keleher