December 1980

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Ernest T. Baughman will end his active service with the Federal Reserve System on January 1, 1981, when he retires as President of the Federal Reserve Bank of Dallas.

The 65-year-old former First Vice President of the Federal Reserve Bank of Chicago became President of the Dallas Reserve Bank in December 1974. As President of the Federal Reserve Bank of Dallas, Baughman has served under Federal Reserve Board Chairmen Arthur F. Burns, G. William Miller, and Paul A. Volcker.

Baughman began his career with the Federal Reserve Bank of Chicago in 1946, after his discharge from the U.S. Navy. He joined the Chicago Fed as an agricultural economist and worked his way up the executive ladder to First Vice President in 1970.

Among special assignments in the course of his career, Baughman has participated in the meetings of the Federal Open Market Committee since 1974. In 1955, he served as an advisor to the White House on foreign disposal of agricultural surpluses. In 1953, he took a leave of absence from the Chicago Reserve Bank to serve as a member of the staff of the Commission on Foreign Economic Policy.

Throughout his career, Baughman has also been involved in public service. For many years, he was a lecturer at the Graduate School of Banking at the University of Wisconsin, where he taught courses in monetary policy, business conditions, and agricultural finance. He currently serves on the advisory councils of the School of Management, University of Texas at Dallas, and the Center for Banking Education, Texas Southern University at Houston.
Since You Asked

A fringe benefit of working at a Federal Reserve Bank is the frequent invitation to speak before various groups. And speeches inevitably generate questions. This is a brief response to the question asked most frequently following speeches during the past month.

Question: How high can interest rates go?
Answer: The sky is the limit.

I don’t know what the songwriter was thinking about when he wrote, “On a clear day you can see forever,” but he could have been describing interest rates in an inflationary environment. Interest rates, of course, are prices for the use of borrowed money, or credit.

If inflation strengthens or it is widely believed inflation will strengthen, interest rates will go higher. If inflation slows or inflationary expectations diminish, interest rates will move to lower levels.

With prices rising, it pays to borrow money and buy “things.” In this way, one can beat future price increases for things and pay back loans in cheaper dollars. Consequently, people are more eager to borrow in an inflationary environment—eager to the point of being willing to pay higher interest rates on loans.

But the lender of the money also knows that loans are repaid with money that has less value than the money loaned. He can “remain whole” only if he can charge interest rates higher than the rate at which prices are rising. The relation of prices and interest rates is illustrated by the average changes in prices of producers' finished goods during four recent five-year periods and average interest rates on high-grade corporate bonds during the same periods.

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<tbody>
<tr>
<td>Price increase . . .</td>
<td>0.2</td>
<td>2.5</td>
<td>6.8</td>
<td>7.9</td>
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<tr>
<td>Interest rate . . .</td>
<td>4.4</td>
<td>5.7</td>
<td>7.7</td>
<td>8.7</td>
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During the first half of this 20-year period, interest rates were 3 to 4 percentage points above the rate of increase in prices. As the rate of inflation sharply accelerated after 1970, this margin dropped to approximately 1 percentage point. One possible interpretation of the smaller differential after 1970 is that interest rate levels have not fully adjusted to the higher rate of inflation, probably because of hopes that the rate of inflation will moderate in the future. If it does not, interest rates would probably rise further as the previous margin is reinstated.

Conclusion: without inflation, long-term interest rates would be around 4 percent, but there is no natural limit to either inflation or interest rates.

—Ernest T. Baughman
President, Federal Reserve Bank of Dallas
Increased Trade Spurs Development of International Financial Corporations in the Eleventh District

By Mary G. Grandstaff

The Eleventh Federal Reserve District, especially the Gulf Coast area, has become an increasingly important center for world trade in recent years. Between 1974 and 1979, the Houston Customs Region (which includes Texas, New Mexico, Oklahoma, Colorado, and a small portion of Louisiana) experienced more rapid growth in the value of total exports and imports than any of the other eight U.S. Customs regions. The growth in the value of imports in the Houston region—over 254 percent between 1974 and 1979—was more than twice as high as that for any other region except New Orleans.

The Eleventh District’s increased participation in international commerce has necessitated specialized financing facilities. As a result, international departments of local banks have grown substantially in both size and expertise. In addition, large out-of-state banks have supplied a considerable part of the District’s international financing requirements by establishing Edge Act and Agreement corporations, which are subsidiaries that may engage in any activities deemed relevant to international trade or foreign investment. At present, commercial banks may legally engage in most of the same activities, but the subsidiaries have some advantages over commercial banks.

The role of Edge Act and Agreement corporations in the Eleventh District has increased significantly over the past 10 years. As late as the mid-sixties, there were none of these corporations in the District, though one corporation had established a representative office in Houston in the 1920’s. By mid-1980, there were 12 (9 in Houston and 3 in Dallas), with combined total assets of $435 million. This article briefly traces the development of international banking subsidiaries in the United States and the emergence of the Eleventh District as a rapidly growing international trade and financial center.

Banks in the United States have become more involved in international finance . . .

Although world trade has always been an essential element in the nation’s economic development, most of the transactions were financed by foreign banks until well after the turn of this century. The lack of involvement of U.S. banks was partly due to legal constraints that severely hindered their ability to accommodate foreign transactions. As the nation grew, the increase in foreign financing requirements of both the Government and industry led to changes in the law.

A 1916 amendment to Section 25 of the Federal Reserve Act allowed banks to establish subsidiary corporations to deal solely with international financial activity. These corporations could be owned
EDGE ACT AND AGREEMENT CORPORATIONS
IN ELEVENTH FEDERAL RESERVE DISTRICT, JUNE 30, 1980

<table>
<thead>
<tr>
<th>Name</th>
<th>Location</th>
<th>Commenced business</th>
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<tbody>
<tr>
<td>Republic International Company</td>
<td>Dallas</td>
<td>May 31, 1968</td>
</tr>
<tr>
<td>First International Banking Corporation</td>
<td>Dallas</td>
<td>February 3, 1969</td>
</tr>
<tr>
<td>Citibank International–Houston</td>
<td>Houston</td>
<td>March 1, 1972</td>
</tr>
<tr>
<td>Bank of America International of Texas</td>
<td>Houston</td>
<td>March 24, 1972</td>
</tr>
<tr>
<td>First City International Corporation of Texas</td>
<td>Houston</td>
<td>July 27, 1973</td>
</tr>
<tr>
<td>Continental Bank International (Texas)</td>
<td>Houston</td>
<td>April 15, 1974</td>
</tr>
<tr>
<td>Bankers Trust International (Southwest) Corporation</td>
<td>Houston</td>
<td>June 10, 1974</td>
</tr>
<tr>
<td>Chase Bank International–Houston</td>
<td>Houston</td>
<td>September 26, 1974</td>
</tr>
<tr>
<td>Tokyo Bancorp International (Houston), Inc.</td>
<td>Houston</td>
<td>September 1, 1976</td>
</tr>
<tr>
<td>First Dallas International Banking Corporation</td>
<td>Dallas</td>
<td>February 28, 1978</td>
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<tr>
<td>First Chicago International–Southwest</td>
<td>Houston</td>
<td>May 1, 1979</td>
</tr>
<tr>
<td>Banque de Paris et des Pays-Bas International (Houston) Company</td>
<td>Houston</td>
<td>November 20, 1979</td>
</tr>
</tbody>
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1. Investment-type corporation.
2. In process of reorganization. Board approval was obtained in July to establish the head office in San Francisco, with branches in Dallas and Houston.

either by individual banks or by a number of banks jointly. (Most have been formed by individual banks.) The 1916 amendment, however, does not provide for national chartering of the corporations. Those established under the amendment are state-chartered institutions, but the scope of their activities is regulated through an agreement with the Federal Reserve System, so they are called “Agreement” corporations.

The addition of Section 25(a) to the Federal Reserve Act in 1919 provided for the Federal chartering of corporations organized for the purpose of engaging in international financial operations and placed them under the direct regulation of the Federal Reserve System. These institutions are known as “Edge” or “Edge Act” corporations, in recognition of the legislation’s sponsor, Senator Walter Edge of New Jersey.

Subject to sound banking practices, both types of corporations may accept demand, time, and savings deposits from foreign depositors for use in conducting international transactions or from U.S. depositors for conducting transactions abroad. They also may engage in financing goods and services for export or import and, under certain guidelines, invest in foreign corporations and financial institutions. Between 1957 and 1963, regulations did not allow a corporation to handle both banking and investment operations. Therefore, banks that wanted to engage in both types of operations had to form two subsidiaries. Although the restriction was removed in 1963, some banks have continued to form or operate two distinct types of corporations because of administrative advantages and a few remaining restrictions on subsidiaries engaged in banking activities.

Operations of Edge and Agreement corporations are basically the same, but there are a few major organizational differences. An Edge corporation, for example, has a minimum capital requirement of $2 million; an Agreement corporation has no minimum requirement. Since parent banks can invest no more than 10 percent of their capital and surplus in either type of subsidiary, an individual bank must have $20 million or more in capital and surplus in order to form an Edge corporation. By statute, an individual bank has to have only $1 million in capital and surplus to establish an Agreement corporation.

A number of Edge and Agreement corporations were formed when the original legislation was enacted. Eighteen, including three Edge corporations, were organized prior to 1930. Foreign trade declined as a result of the Great Depression, however; and only two of these institutions, both Agreement corporations, remained in operation past the early 1930's. World War II and subsequent exchange controls further dampened U.S. banks' interest in
EXPORTS AND IMPORTS OF MERCHANDISE
(Dollar amounts in millions)

<table>
<thead>
<tr>
<th>Item</th>
<th>1979</th>
<th>1974</th>
<th>Percent change</th>
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<tr>
<td>Houston Customs Region</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Exports¹</td>
<td>$21,295</td>
<td>$11,278</td>
<td>88.8</td>
</tr>
<tr>
<td>Imports²</td>
<td>28,266</td>
<td>7,976</td>
<td>254.4</td>
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<tr>
<td>Total</td>
<td>$49,561</td>
<td>$19,254</td>
<td>157.4</td>
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<tr>
<td>All nine U.S. Customs regions</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Exports¹</td>
<td>$181,802</td>
<td>$98,507</td>
<td>84.6</td>
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<tr>
<td>Imports²</td>
<td>207,131</td>
<td>100,997</td>
<td>105.1</td>
</tr>
<tr>
<td>Total</td>
<td>$388,933</td>
<td>$199,504</td>
<td>95.0</td>
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</table>

1. Free alongside ship (f.a.s.) value basis.
2. Customs value basis.


International finance. Only five new corporations—three Edges and two Agreements—were formed in the United States between 1930 and 1955.

In the late 1950's the interest of U.S. banks in international finance was rekindled. By that time, exchange restrictions of foreign countries had eased, international trade had revived, U.S. investments abroad were surging, and the U.S. dollar had become the major currency used in international finance. Only 7 international financial corporations were operating in the United States at the end of 1955, but 10 years later there were 42.

The rapid growth in Edge and Agreement corporations has continued since the mid-sixties. At the end of 1979, there were 132 such institutions operating in the United States. Seventy were banking-type Edge Act corporations (defined as those having aggregate demand deposits and acceptance liabilities exceeding their own capital and surplus), with total assets of almost $14 billion and total deposits of more than $6 billion. The recent increase has been encouraged by several major developments: substantial growth in the Eurodollar market, an easing in regulation of the corporations, and rapid expansion in international businesses and world trade.

The original legislation provided for clear distinctions between Edge and Agreement corporations, but these differences have become blurred in recent years to the extent that both types of subsidiaries are now commonly referred to as Edge corporations. Agreements continue to be formed, however. The two differ primarily in their chartering and capitalization. There are two basic reasons for choosing to establish an Agreement corporation as opposed to an Edge corporation: some state banking laws allow state banks to acquire stock in a state-chartered corporation but not a federally chartered one, and not all corporations need $2 million in capital, the minimum required for an Edge corporation.

A key factor in the growth of Edge and Agreement corporations is their ability to operate out of state; that is, a bank in one state can organize an international financial corporation in another state. In the United States, regulations prohibit banks from branching across state lines. The growth in the number of out-of-state corporations (the Edge or Agreement corporations are located in states other than the states where the parent banks are located) advanced apace with the increase in the total number of international corporations. The nation's largest banks were especially active in organizing out-of-state corporations—in some instances, forming one in each of several cities in the United States.

A revision of Federal Reserve Regulation K in 1979 is producing a major reorganization of Edge and Agreement corporations. Two of the most notable changes permit (1) foreign institutions to acquire Edge corporations and (2) Edge corporations to establish branches in the United States. The purpose of that revision was to eliminate discrimination against foreign-owned banking institutions and the disadvantages encountered by Edge or Agreement corporations in competing with such...
institutions, either in the United States or abroad. Since the revision, some large banks that had separate subsidiaries in more than one city have been consolidating their international financial operations into single corporations that consist of a head office, at or near the location of the parent bank, and branch offices at former sites and, in some cases, at new sites.

... with increasing participation by banks in the Eleventh District

The advent of international financial corporations in the Eleventh District is relatively recent. A representative office of an international banking subsidiary had been located in Houston during the early 1920's. That was the District's sole experience with international financial corporations until the late 1960's. In 1968, two Dallas banks formed Edge Act corporations for holding their overseas investments; one of the banks formed a second subsidiary in 1977.

There were no international financial corporations in Houston until the early 1970's. The emergence of Houston as an international trade center largely stems from the sharp increases in petroleum prices since that time. Almost a third of the nation's imports of petroleum and related products are routed through the Texas Gulf Coast area (for which Houston serves as the predominant financial center), and more than half of the total exports of coal-cutting, mining, and well-drilling machines and parts are shipped from the Houston Customs Region.

Largely as a result of this heavy routing of petroleum and related products through the area, foreign trade in the Houston Customs Region has risen considerably more rapidly than in any of the other eight U.S. Customs regions. The Houston Customs Region accounted for 12.7 percent of all U.S. exports and imports of merchandise last year, up from 9.7 percent five years earlier. Consequently, in terms of the total value of exports and imports, Houston moved from fifth among all U.S. Customs regions in 1974 to third (just slightly behind second-place Chicago) in 1979.

Of the nine international financial corporations located in Houston, one was formed by a local bank to hold its foreign investments. All the others are owned by banks outside the state—three by large New York City banks, two by Chicago banks, one by a San Francisco bank, and two by foreign banks. Each of these eight subsidiaries engages in banking-type activities. Seven are Edge corporations, and one is an Agreement corporation.

The 12 Edge and Agreement corporations in the Eleventh District at mid-1980 had total assets of $435 million. Total deposits of the eight corporations that engage in banking activities amounted to more than $175 million, and commercial letters of credit issued and outstanding totaled over $530 million.

Because of their fairly small capitalization (a total of less than $37 million for the seven banking-type Edge Act corporations in the Eleventh District), international banking corporations have small lending limits compared with those of some local banks. Nevertheless, they are subsidiaries of some of the nation's largest commercial banks, so they have access to huge amounts of financial resources. They also have access to their parent banks' expertise in international trade and their extensive systems of branches to expedite transactions.

As a result of their advantages over commercial banks, such as the ability to invest in foreign corporations and to establish offices in other states, Edge and Agreement corporations should continue to play an important role in the international activities of U.S. banks. Most of the future activity is likely to be concentrated on branches.

Edge and Agreement corporations are also expected to continue expanding rapidly in the Eleventh District. Substantial interest in the formation of branches of international banking corporations in the District has already become evident. Since September 1979 the Federal Reserve Board has received applications for 10 branches to be located in the District. Five of those applications reflected reorganization of existing corporations in response to the provision of revised Regulation K that allows branches. The other five were requests to establish branches, in the Eleventh District, of new corporations to be headquartered elsewhere. One of the applications was for a branch in Dallas, and nine were for branches in Houston. By mid-July this year, 7 of the 10 applications had been approved.
"Stagflation" and "structural problems" have appeared in economic discussions with increasing frequency in recent years. This is a shorthand way to indicate that the prices and production features of the United States economy may be less responsive to conventional monetary and fiscal policies than in prior years and less responsive also to increasing margins of unutilized resources.

The apparent immunity of prices and production to conventional policy ministrations usually is attributed to inflation (and inflation expectations) and structural rigidities in the economy. Insofar as this diagnosis is correct, improvement in economic activity must await demonstrated progress in reducing the pace of inflation and greater progress in eliminating or reducing the maze of governmental and private rigidities that have been built into the economy over a period of years.

This will take awhile even if attacked forthrightly and vigorously. Especially, it will take awhile, and may never be achieved, if attacked only gradually and with conventional monetary and fiscal policies, without more vigorous moves to create a more adaptable economy. Many, probably most, of the relevant structural rigidities have been installed to protect a particular interest group or sector from the effects of competition. Hence, moves to dismantle or reorient the protective structures will not be greeted with enthusiastic support from all quarters— as has been demonstrated with the moves to deregulate airlines, trucking, railroads, and interest rates on time and savings deposits; and with proposals to repeal or modify the Davis-Bacon Act, the Walsh-Healey Act, the Service Contract Act, laws establishing minimum wages, agricultural price-support programs, etc.

Without aggressive moves to free up markets, many fear that monetary and fiscal policies sufficiently stringent, and of sufficient duration, to make measurable inroads on inflation will be associated with unacceptable levels of production and unemployment and of unacceptably long duration. If public officials feel they are caught between a rock and a hard place, it may be because they are.

The policy choices are limited, and none is of a flavor that would please the taste buds of everyone. The current policy is to wage a war of attrition against inflation, gradually starving inflation into submission while providing a reasonable level of "nourishment" to the real economy. Wars of attrition move slowly, hence the pleas for patience. Also, the outcome is not predictable beyond the shadow of any doubt. It seems quite unlikely, however, that the growth of production will ex-
ceed the growth of the population while inflation is being starved into submission—hence the prospect that the decline in real per capita income that began in the first half of 1979 will continue through 1981 and probably beyond.

An alternative policy, intended to avoid the erosion of real per capita income, would undertake to provide enough growth of money and credit to finance growth of production and consumption in addition to the current rate of inflation. However, recent experience strongly suggests that this policy would be associated with acceleration of inflation and, before long, declining production. Hence, this policy, too, probably would not avoid erosion of real per capita income.

A third alternative would attempt to neutralize the effects of structural rigidities by "freezing" or exercising direct control over wages, and possibly prices of commodities and services as well. Prior episodes of wage and price controls have not been viewed favorably by most economists. Such controls usually have been imposed in order to move the economy to higher levels of employment and production while restraining the upward pressures on wage rates and prices. Hence, expansionary monetary and fiscal policies were utilized concurrently with wage and price controls. This policy posture sets the clock ticking while doing nothing to solve the underlying structural problems. Furthermore, it creates a broad array of new structural problems that become progressively more severe with the passage of time. The near-term outcome of this policy might be to slow the pace of inflation and to avoid erosion of production, but the respite quite certainly will be brief and the longer-term outcome quite certainly would be even more inflation and greater erosion of production and real per capita income.

A fourth alternative probably would be plausible only after the destructive effects of inflation were more evident to a broad segment of the population and emergency actions were called for. This policy alternative would embrace the view that basic institutional changes are required in order to get widespread recognition of the inflation and economic growth problems and support for strident actions to solve them. Only in this environment, it is argued, would a reversal of inflation expectations be achieved. The institutional changes could embrace a number of actions. The Congress could take action to require balance between revenues and expenditures by constitutional amendment or other means. The Federal Reserve could announce unequivocal commitment to noninflationary rates of growth of money or bank credit. Indexation of wage and other contracts and entitlements could be outlawed. Wage rates could be frozen briefly, possibly for a year, while aggressive moves were undertaken to eliminate anti-competitive laws, regulations, practices and policies, public and private, wherever a persuasive overriding public interest was not involved or could not be achieved by alternative means.

The purpose of this type of strident policy would be twofold. A primary purpose would be to eliminate inflation quickly, while avoiding extended underutilization of labor and other resources, and, hence, to avoid erosion of real per capita income. Equally important would be the elimination of structural rigidities that insulate wages and prices from the effects of unemployment and changes in utilization rates of other resources. With flexibility restored to wages and prices, full employment and price stability should be compatible, and ongoing economic growth and rising real per capita income would be feasible.
Well Services Play Vital Role in Oil and Gas Production

By Edward L. McClelland

The nation’s search for domestic energy supplies has boosted drilling for crude oil and natural gas to a record high. Rotary drilling rigs in operation number more than 3,200, compared with the prior record of 3,137 in December 1955. Industry estimates indicate 64,000 wells will be drilled this year, surpassing the previous high of 58,418 in 1956. Three-fifths of all domestic drilling and fully two-thirds of all manufacturing of oil field machinery are concentrated in the states of the Eleventh Federal Reserve District, and the increase in oil field activities has helped insulate the regional economy from the nationwide recession.

The boom in drilling has been spurred by the steep increases in oil and gas prices that resulted as domestic price ceilings were lifted and phased out. Wellhead prices of newly discovered oil rose from around $3 a barrel in 1970 to about $40 in 1980. Although prices for most categories of gas production continue to be controlled, they have risen from about 20 cents per thousand cubic feet 10 years ago to $2 to $7. Those increases provided more than enough economic incentive to bring wells into production that just a few years ago would have been unprofitable to complete.

As a result of higher prices, the decline in oil production appears to be leveling off. Increased drilling is not the sole contributor to a brighter outlook for stabilization of domestic crude production, however. Another important ingredient is improved oil field technology that helps to extend the life of a well and allows denser geological formations to be tapped. Much of that technology is implemented by a number of well service industries, and their business is growing faster than drilling activity.

The effect of higher prices on supplies has been greater for natural gas than for crude oil. Gas production rose from 10.4 trillion cubic feet in 1979 to about 15.0 trillion cubic feet in 1980. Geologists believe substantial deposits of gas remain undiscovered.

Demand for well servicing, workovers . . .

While the rotary rig count is a major barometer of the drilling industry, the breadth of oil field activities can be measured by the demand for well services. More than 50 well services are provided by a diverse group of manufacturers, contractors, and suppliers, although only about 10 services are offered by any single firm. Among the fastest growing industry groups are (1) well servicing and (2) cementing and well stimulation.

Well servicing contractors engage in three broad, and often overlapping, activities—well maintenance, workovers, and well completions. Routine maintenance on producing wells is required to ensure efficient operation. Maintenance typically includes repair and replacement of tubing and pump equipment in the wellhole. On average, an oil well needs servicing 1.1 times a year; a gas well needs less attention.

Workovers are more complex operations that attempt to increase production from existing wells.
One common task is to clean buildups of sand and paraffin deposits out of producing wells, with minimal disruptions in production. Other operations include deepening wells, opening new geological formations, patching casing, and reentering plugged wells.

Completion of oil and gas wells is the smallest sector of the well servicing industry, but it is the fastest growing, thanks to the rise in rotary rig activity. Well completions begin after the well bore is drilled and involve installing the well casing and pump and other work necessary to put the well into production.

About 650 independent contractors make up the well servicing and workover industry. Although the largest firms have fleets of nearly 300 rigs, most of the contractors own fewer than 5 rigs and do business within a 50-mile radius of their home base. Industry revenues totaled nearly $3 billion last year and may increase more than 20 percent this year. Much of that increase will come from helping to complete 80,000 new wells this year. But there are also 527,000 producing oil wells and 166,000 producing gas wells that require maintenance.

Growth of the industry can also be measured by the increase in the number of well service-workover rigs, which are self-propelled and smaller than the stationary rotary rigs. Total rig deliveries to the industry grew 38 percent per year from 1975 to 1978. The increase in deliveries weakened a bit in 1979, when contractors were uncertain about the effects that the Natural Gas Policy Act of 1978 and phased decontrol of oil prices would have on demand for their services. An estimated 550 to 600 rigs were to be added to the fleet in 1980, and more than 700 are expected to be added in 1981.

...cementing and well stimulation...

Another group of fast-growing well services is cementing and well stimulation. The 14-percent annual rate of growth in the number of cementing units from 1975 to 1978 reflected increases in both the number of new wells and the average depth of wells. Cementing is necessary in well completions to fill the annular space between the well casing and the open borehole. Sealing off oil- and gas-bearing formations and saltwater sands prevents pollution of freshwater supplies. Cementing is often necessary to repair a well and to plug a well to prevent excessive water or gas production.

The purpose of well stimulation is to increase production rates and improve recovery efficiencies. Acidizing and hydraulic fracturing are the principal methods of stimulation. A well is acidized by pumping diluted solutions of acid down the well and into the fissures of the oil- and gas-bearing rock. The acid dissolves the materials that restrict fluid flow and allows more oil and gas to flow into the well.

Hydraulic fracturing involves pumping large amounts of fluid under high pressures to crack rock formations that contain oil and gas.
a mixture of chemically gelled water and sand is used, although sintered bauxite is used instead of sand in deep formations, where temperatures and pressures are high. The fissures created are held open by the injected sand after the water pressure is reduced, allowing oil and gas to flow out more freely.

Well stimulation services are growing in importance because most porous geological formations allowing a free flow of oil and gas probably have been discovered and many older formations are depleted. Commercial wells are now being completed in formations of such low porosity that just a few years ago the wells would have been plugged as dry holes. Moreover, drillers have found that stimulating new wells routinely not only improves product flow but also lengthens the life of the well and reduces overall maintenance.

New wells are not the only source of growth for stimulation services. Often, existing wells can be reworked to increase production. For example, many wells extend through more than one oil- or gas-bearing formation and are only drawing from an older porous formation. Stimulation of some denser strata often increases output. More production may be obtained from existing wells at relatively low costs when expensive drilling by a rotary rig is not necessary.

... is growing faster than rotary rig count
Measurements of the growth of well stimulation are skimp. The industry consists of about eight major companies and numerous “mom and pop” operations. And to date, firms have been reluctant to reveal how much business they book. Without a clearinghouse of stimulation activity, as there is for other sectors of the drilling industry, growth can only be surmised from secondary information.

One revealing measurement is a comparison between the growth of well stimulation and the rise in the average number of rotary rigs. From 1975 to 1978, the most recent years for which data on well stimulation are available, the rotary rig count
rose 12 percent per year. The 11-percent annual rise in cement used was slightly lower, but the 19-percent gain in the number of fracturing units was substantially greater. Moreover, total available horsepower increased 23 percent annually, implying the average fracturing unit grew in size. Consumption of sand rose 21 percent a year, while the total horsepower of acidizing units trended upward at a rate of 15 percent a year.

The rise in well stimulation services is also reflected in changes in the stripper well industry. In 1971 the number of stripper wells—those producing 10 barrels or less of oil a day—ended a 10-year decline, as abandonments of such small producing wells peaked at 18,421, according to the Interstate Oil Compact Commission and National Stripper Well Association (IOCC-NSWA). The sharp rise in oil prices made it profitable to operate those small wells longer at lower levels of output. Daily average production of stripper wells declined from 3.3 barrels in 1971 to 2.8 barrels last year. Moreover, abandonments declined sharply to 7,668 as the number of stripper wells trended upward.

The impact of well stimulation on stripper production can be inferred by comparing data published by the IOCC-NSWA and the U.S. Department of Energy (DOE). The IOCC-NSWA data are tallied from the actual number of wells that produce 10 barrels or less a day. By the DOE definition, once a well is classified a stripper, it remains in the stripper category. Therefore, stripper data published by the DOE include production from wells that were formerly stripper wells but have been converted to nonstripper status by stimulation or other techniques. And the difference between the two data series gives an indication of the impact of stimulation. For the three years 1977 through 1979, the differences were 5 million barrels, 45 million barrels, and 84 million barrels, respectively, suggesting a rapid increase in the stimulation of small producing wells.

Outlook for drilling activity brightens

The sharp escalation in oil and gas prices over the past decade has greatly expanded the potential number of wells that can profitably be brought into production. Prospects are so numerous that the current rate of rotary rig activity will likely be sustained for another one to two years. Demand for well services looms even greater. Virtually all new wells will be stimulated, and many existing oil and gas wells will be reworked in the future to boost production. In addition, the growing use of enhanced oil recovery techniques will further increase the demand for well servicing. Industry analysts estimate nearly a third of future expenditures for enhanced oil recovery will go for oil field services.

In the longer run, the strength of drilling activity will depend on discovery rates. Development and infill drilling in known fields account for much of the current boom, since exploratory drilling is increasing somewhat more slowly. Future drilling will require more wildcatting to find new oil and gas fields. Few people in the industry forecast the discovery of huge fields. Yet, large portions of Alaska, the Outer Continental Shelf, and the Overthrust Belt of Utah and Wyoming are unexplored and might yield a few surprises.

The outlook for significant additions to oil reserves is considerably less optimistic than the prospects for expanding gas reserves. Oil is generally found at shallower depths than gas, and most shallow formations have been discovered. Therefore, current drilling for oil is largely a mop-up operation in small reservoirs that will, at best, only stabilize the long-run decline in crude production.

This is not the case for natural gas, however, as there is an increasing likelihood that substantial deposits of gas will be found. Most are formations below 10,000 feet, which is considerably deeper than the present average of 5,600 feet for gas wells. Deep reservoirs are more likely to contain gas because it withstands heat and pressure better than crude oil. Moreover, the "tight" sands in the western states hold large deposits of gas that can be produced at current prices. It is possible that the present ratio of proved gas reserves to consumption can be sustained indefinitely—or even increased—in the future.

December 1980/Voice
New member banks

City National Bank of Kilgore, Kilgore, Texas, a newly organized institution located in the territory served by the Head Office of the Federal Reserve Bank of Dallas, opened for business November 3, 1980, as a member of the Federal Reserve System. The new member bank opened with capital of $1,000,000 and surplus of $1,000,000. The officers are: J. B. McCracken, Chairman of the Board; Charles Ringler, Vice Chairman of the Board; Charles H. Buddy Iles, President; Joan Luce, Vice President and Cashier; and Ouida Moore, Vice President.

Town North National Bank, Longview, Texas, a newly organized institution located in the territory served by the Head Office of the Federal Reserve Bank of Dallas, opened for business November 10, 1980, as a member of the Federal Reserve System. The new member bank opened with capital of $1,500,000 and surplus of $1,500,000. The officers are: William Y. Rice, Chairman of the Board; Bruce Morris, President; Hal Long, Vice President; and David Ward, Cashier.

New nonmember bank

Houston North Side Bank, Houston, Texas, a newly organized nonmember bank located in the territory served by the Houston Branch of the Federal Reserve Bank of Dallas, opened for business November 10, 1980.
"I understand and share the immediate concern about recession. But I am even more concerned that we shape policies that also look toward the medium- and longer-term needs of the economy, lest we inadvertently extend and repeat the pattern of low productivity, rising inflation, and economic instability.

"In that connection, I am convinced that the stability and vigor of our economy will not be restored over time unless the ominous cycle of rising levels of inflation in successive periods of expansion can be brought to a halt. We would neglect that prime objective of economic policy at our peril. For that reason, the Federal Reserve has been, and will continue to be, guided by the need to maintain financial discipline—a discipline reflected in reduced growth over time of the monetary and credit aggregates.

"As recently as July the Federal Reserve reaffirmed its ranges for the monetary aggregates that call for a deceleration of money growth in 1980 from the pace during the preceding year. The tentative monetary ranges established for next year specify slightly lower growth. I am glad to say that this approach was supported by the relevant congressional committees.

"In general terms, the targets for growth of the monetary aggregates are designed to encourage progress toward price stability. At the same time we would, of course, like to see resumption of sustainable economic growth. In the short run, monetary policy alone cannot guarantee that happy combination of events. Technically, the supply of money tends to be related to nominal gross national product, and our targets are consistent with a number of possible combinations of real growth and inflation. If inflation tends to decline, the prospects for satisfactory growth consistent with the targets will be greatly improved. Conversely, to the extent other policies and behavior—public or private—are tending to reinforce inflationary pressures and credit demands, more of the available money supply will be absorbed in financing price increases rather than in real activity. Inflationary expectations will tend to keep interest rates higher than otherwise.

"We cannot escape that problem by simply increasing the money supply to accommodate a higher rate of inflation. The result could only be to prolong and intensify the inflationary process, in turn undermining the recovery and setting the stage for intensification, rather than resolution, of our economic problems. That is why I believe it is so important that all our policies take account of the need to break the insidious pattern of rising rates of inflation in successive cycles—a pattern that, I would remind you, has been accompanied by higher levels of unemployment rather than lower."

Paul A. Volcker, Chairman, Board of Governors of the Federal Reserve System (Before the Committee on the Budget, U.S. House of Representatives, September 10, 1980)
Recent amendments to Federal Reserve Regulation D (Reserve Requirements of Depository Institutions) extend the quarterly reporting requirement from depository institutions with total deposits of less than $5 million to all depository institutions that have total deposits of less than $15 million; defer until May 1981 the reporting and reserve maintenance requirements for nonmember depository institutions with less than $2 million in total deposits; and simplify the calculation of reserve requirements for member and nonmember institutions involved in mergers.

The new method of calculating the reserve requirements for the surviving institution allocates its deposits according to the relative deposit size and structure of the institutions involved in the merger. The requirements will be calculated on a proportional basis without regard to whether the surviving institution is a member or a nonmember of the Federal Reserve System.

At the same time, the Board also adopted an amendment to clarify the definition of "Eurocurrency liabilities."

For a depository institution or an Edge Act or Agreement corporation organized under the laws of the United States, Eurocurrency liabilities include assets held by its non-U.S. offices or by non-U.S. offices of an affiliated Edge or Agreement corporation that were acquired from its U.S. offices only after October 6, 1979.

Eurocurrency liabilities in the case of a U.S. branch or agency of a foreign bank include assets held by its foreign bank, by its parent holding company, or by non-U.S. offices of an affiliated Edge or Agreement corporation that were acquired from the U.S. branch or agency only after October 6, 1979. For a U.S. branch or agency of a foreign bank, Eurocurrency liabilities do not include assets sold to its foreign bank or parent holding company by its affiliated Edge or Agreement corporation.
The Board of Governors of the Federal Reserve System has issued for public comment a second complete revision of Regulation Z (Truth in Lending). The revision has been proposed in order to fulfill the objectives of the Truth in Lending Simplification and Reform Act, which requires that simplified rules be in effect by April 1, 1981.

To carry out these objectives, the Board has proposed five simplification principles:

1. The regulation should contain precise, simple rules—based on enforceable obligations—as opposed to principles that create ambiguity and require additional regulatory clarification.

2. Tolerances in disclosures should be more flexible, and the use of estimates should be increased.

3. The emphasis should be on disclosures relevant to credit decision-making.

4. Burdens not justified by substantial consumer benefit should be eliminated.

5. The regulation should give creditors some flexibility to tailor disclosures to their own credit plans.

The current proposal focuses primarily on common, everyday types of transactions and would shorten the existing regulation by approximately 40 percent. The Board believes that the reduction of detail should assist in directing enforcement of the law toward substance rather than technical matters. The simplification should also reduce the volume of nonproductive litigation and encourage voluntary compliance.

Comments must be received on or before January 19, 1981. They may be mailed to the Secretary, Board of Governors of the Federal Reserve System, Washington, D.C. 20551, and should refer to Docket No. R-0288.
Recently issued Federal Reserve circulars, speeches, statements to Congress, publications, etc., may be obtained by contacting the Bank and Public Information Department, Federal Reserve Bank of Dallas, Station K, Dallas, Texas 75222, unless indicated otherwise.

**Circulars**


Deferral of Reserve and Reporting Requirements. 2 pp. Circular No. 80-212 (November 5, 1980).

Title 12—Part 217—Interest on Deposits: Fixed Rate Obligations issued by Bank Holding Companies. 3 pp. Circular No. 80-213 (November 6, 1980).


Technical Amendment to Regulation Q—Interest on Deposits. 2 pp. Circular No. 80-215 (November 7, 1980).


Payment of Bahamian Postal Money Orders. 1 p. Circular No. 80-221 (November 17, 1980).

Amendments to Regulation Q [Interest on Deposits]. 1 p. Circular No. 80-223 (November 18, 1980).


Regulation O [Loans to Executive Officers, Directors, and Principal Shareholders of Member Banks]: Forms FFIEC 003 and 004. 1 p. Circular No. 80-227 (November 25, 1980).

**Speeches and Statements**


Statement by Lyle E. Gramley before the Committee on Banking, Housing, and Urban Affairs, U.S. Senate. 8 pp. November 21, 1980.