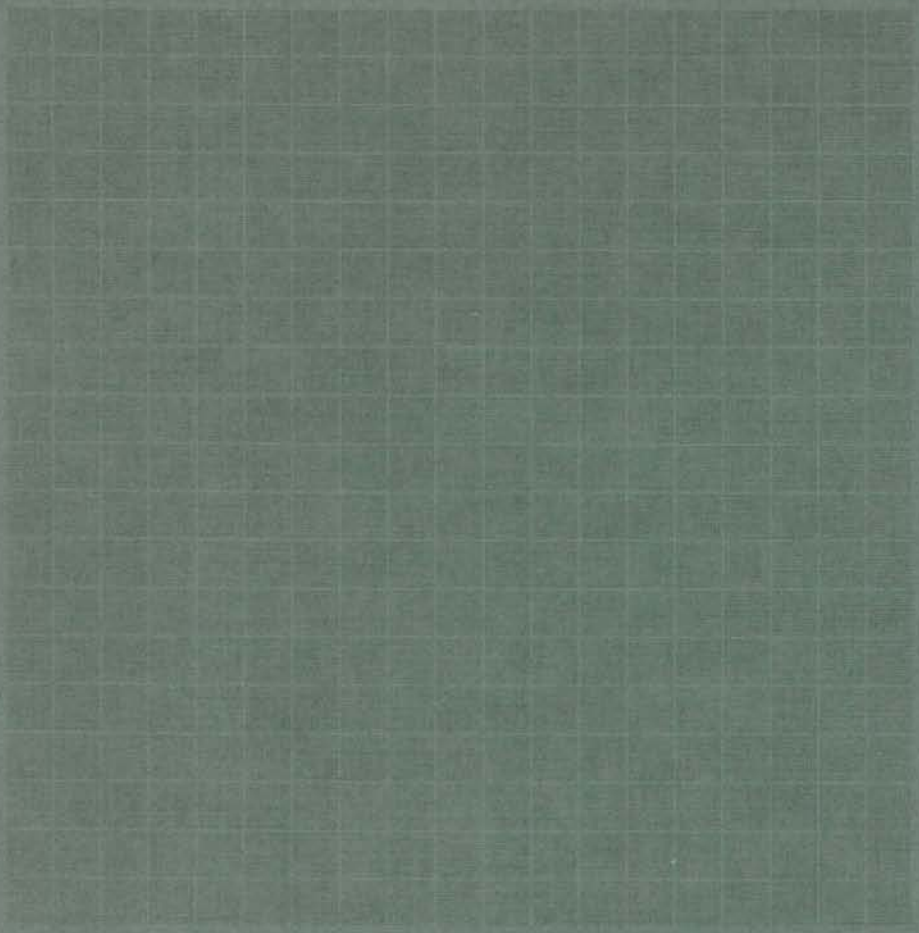
FEDERAL RESERVE BANK OF DALLAS



# 1981 ANNUAL REPORT

# Message from the Chairman and the President

*Robert D. Rogers*

Whether from one of earth's natural resources or from the drive of an individual's spirit, energy transforms our lives into production. Here in the Eleventh Federal Reserve District, energy motivates activity in areas such as agriculture, finance, industry and education. The focus of this year's annual report traces the development and importance of the energy industry to this District and to its financial institutions.

These financial institutions experienced a year in which they adjusted further to deregulation, the expansion of nonbank banks and falling interest rates. They also witnessed the failure of almost 80 banks and nine savings and loan institutions nationwide. Although the past several years have seen a refinement as well as an expansion of the services financial institutions can offer, these institutions have overcome many problems and are emerging stronger and more capable of handling the challenges of the 1980s. The continued recovery of the nation's economy helped our own District's economy by lowering unemployment, allowing more growth in business development and spurring renewed interest in both the housing and manufacturing sectors.

*Robert H. Boykin*

Here at the Federal Reserve Bank of Dallas, many new services were introduced in an effort to expand our offerings to the financial community and keep pace with innovations in the ever-widening arena of electronic banking. As always, efforts to provide high quality and efficient services remained foremost in our minds. We hope that we have been able to provide institutions in this District with accurate and timely services, and input concerning areas where we may be lacking is encouraged. Our relationship with institutions in this District is our greatest asset, and we hope to see the continued growth of that relationship throughout the coming year.

We also hope to see an expansion of the positive spirit and energy so prevalent throughout 1984.

Sincerely,

Robert D. Rogers
Chairman of the Board

Robert H. Boykin
President

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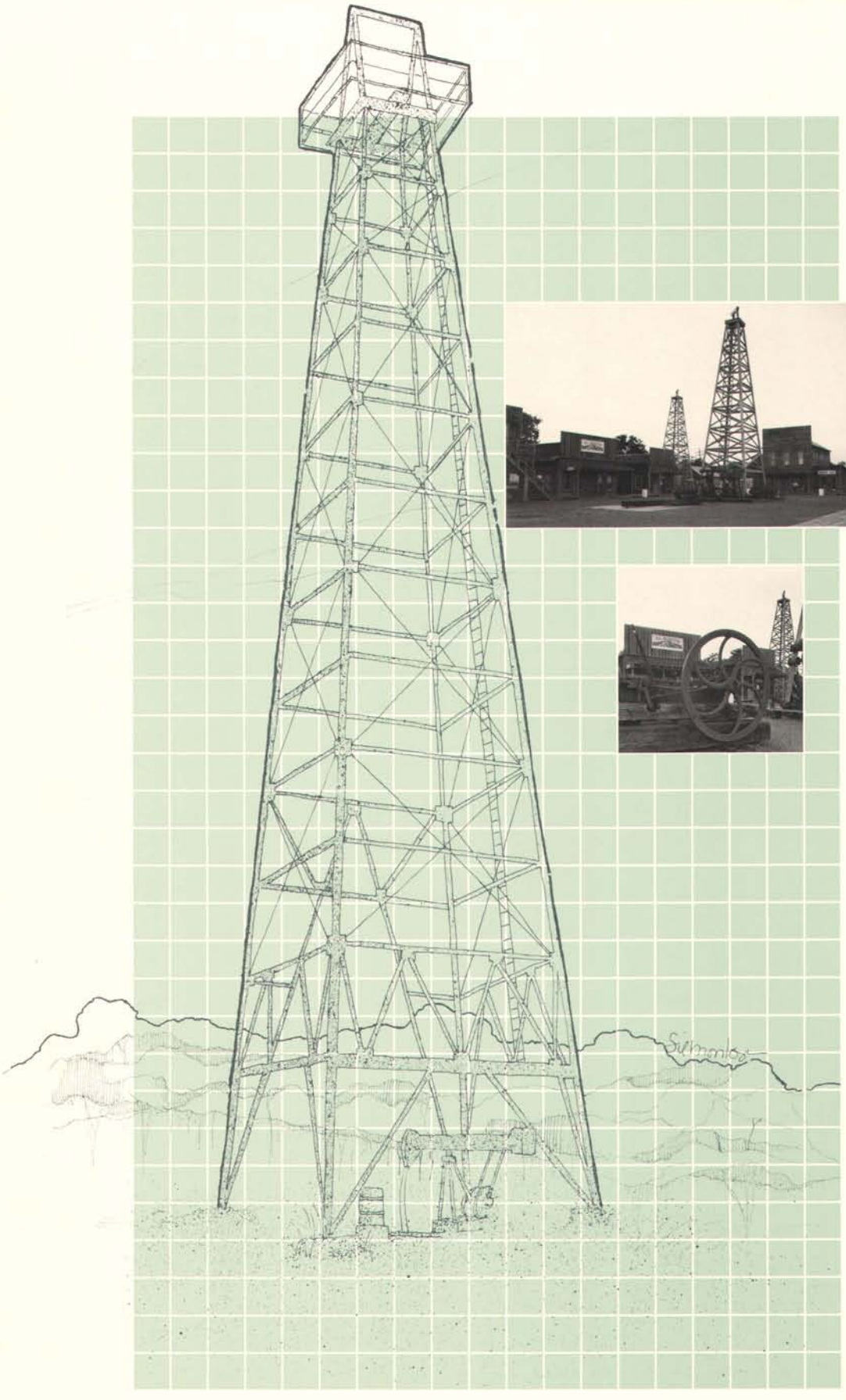


# THE ENERGY INDUSTRY
## ITS CHANGING ROLE IN THE TEXAS ECONOMY

Energy. Its importance to the state of Texas is legendary. Throughout the 20th century, the extraction and processing of oil and natural gas have accounted for a large share of economic activity in Texas. The industry provides employment and income, and contributes to the growth and development of the economic fabric of the state.

This article traces the interactions between the dynamic energy sector and the Texas economy. A review of the evolution of the energy sector demonstrates its importance to the Texas economy.

### Energy's importance

The importance of the energy industry to the Texas economy has changed as the industry has developed and matured. At times, especially in the 1970s, energy provided the driving force for economic growth in Texas. At other times, however, the energy industry played a lesser role in economic growth—as in the 1960s when development of a diversified non-energy sector dominated new job creation.

Energy's importance to the Texas economy can be seen in the diversity of activities that comprise the whole. Drilling contracting firms, drilling service firms, oil field equipment manufacturers, pipeline firms, tanker and trucking firms, refineries, and petrochemical manufacturers are all considered part of the vast energy industry. And these firms are supported by a much broader portion of the economy—including financial and service institutions as well as manufacturers of cement, electronics, fabricated metals and primary metals.

Employment and value added to the products through the production process in the energy industry also illustrate the importance of energy to the Texas economy. In 1983, for example, 8 percent of all non-agricultural employment in Texas was concentrated in the narrowly defined energy industry—oil and gas extraction, oil field equipment manufacturing, refining and petrochemicals. Estimates of the share of employment related to energy, including other manufacturing and service industries that principally cater to the energy industry, range from 15 percent to as high as 25 percent. The energy industry supplies an even larger share of industrial value added in the state. In the 1977 Census, the narrowly defined energy sector was estimated to have accounted for nearly 59 percent of total value added in mining and manufacturing.

### Energy's role

Several factors are important in considering energy's role in the Texas economy. First, although energy appears to have contributed to raising the growth of per capita income in Texas above that of the nation, the state has been successful in developing other industries to compensate for periods when the energy industry performed poorly. Current expansion of the electronics and defense industries indicates that this process will continue.

Second, the energy industry itself is diversified and does not respond uniformly to price changes in oil or natural gas. In the current oil market, changes in oil prices are primarily the result of increases or decreases in the supply of foreign oil. Because price declines are not necessarily the result of decreasing consumption by domestic consumers, falling oil prices may not reduce the strength of the segments selling fully processed, or final, oil and gas products. Although descending oil prices may lessen growth in oil and gas extraction employment, they boost consumption of refined products and petrochemicals. Consequently, expectations of a drop in oil and gas prices may reduce employment in oil and gas extraction but not in refining or petrochemicals.

The implications of changes in the role of energy in the Texas economy are especially important in light of the current outlook for the energy sector. The

declines in production and in reserve supplies of both oil and natural gas, when coupled with expectations of falling inflation-adjusted prices for oil, suggest that the energy industry will decrease in importance in coming years. The effect that this development is likely to have on overall growth in employment and income is of vital concern to the Texas economy.

**Phases of energy's development**

The history of the energy industry and its effects on the Texas economy are separated into four phases in this article. The first phase covers the period from the turn of the century through World War II. In this period Texas began changing from a largely agrarian economy to a more diversified urban economy. Discoveries of major oil and natural gas reserves led to development of the oil and gas extraction industry and the oil field equipment and service industries. Combined with development of the refining and petrochemical industries, the energy sector emerged as an important source of employment to the growing non-agricultural population.

The second phase is the postwar period before the oil embargo in 1973. Although Texas reigned as a dominant power in world energy markets, the performance of the energy industry was mixed. Nominal oil prices were stable, but real (inflation-adjusted) oil prices declined. This decline led to a slump in the energy sector during the late 1950s and 1960s. Employment continued to increase in energy-related service and manufacturing industries, but an even more rapid increase occurred in non-energy-related manufacturing. As a result, the Texas economy became more diversified.

The third phase of development, the period from 1973 to 1983, was dominated by oil price shocks brought about by the Organization of Petroleum Exporting Countries (OPEC). The slumping sections of the energy sector rebounded in 1973 as oil prices quadrupled. The move away from energy employment that characterized the previous phase was reversed, and the share of employment in energy industries grew. Because of the countercyclical performance of the energy sector during the national recessions in 1974 and 1980, the Texas economy outperformed the U.S. economy. Subsequently, increased dependence on energy delayed Texas' entry into the recession until 1982 and slowed the ensuing recovery.

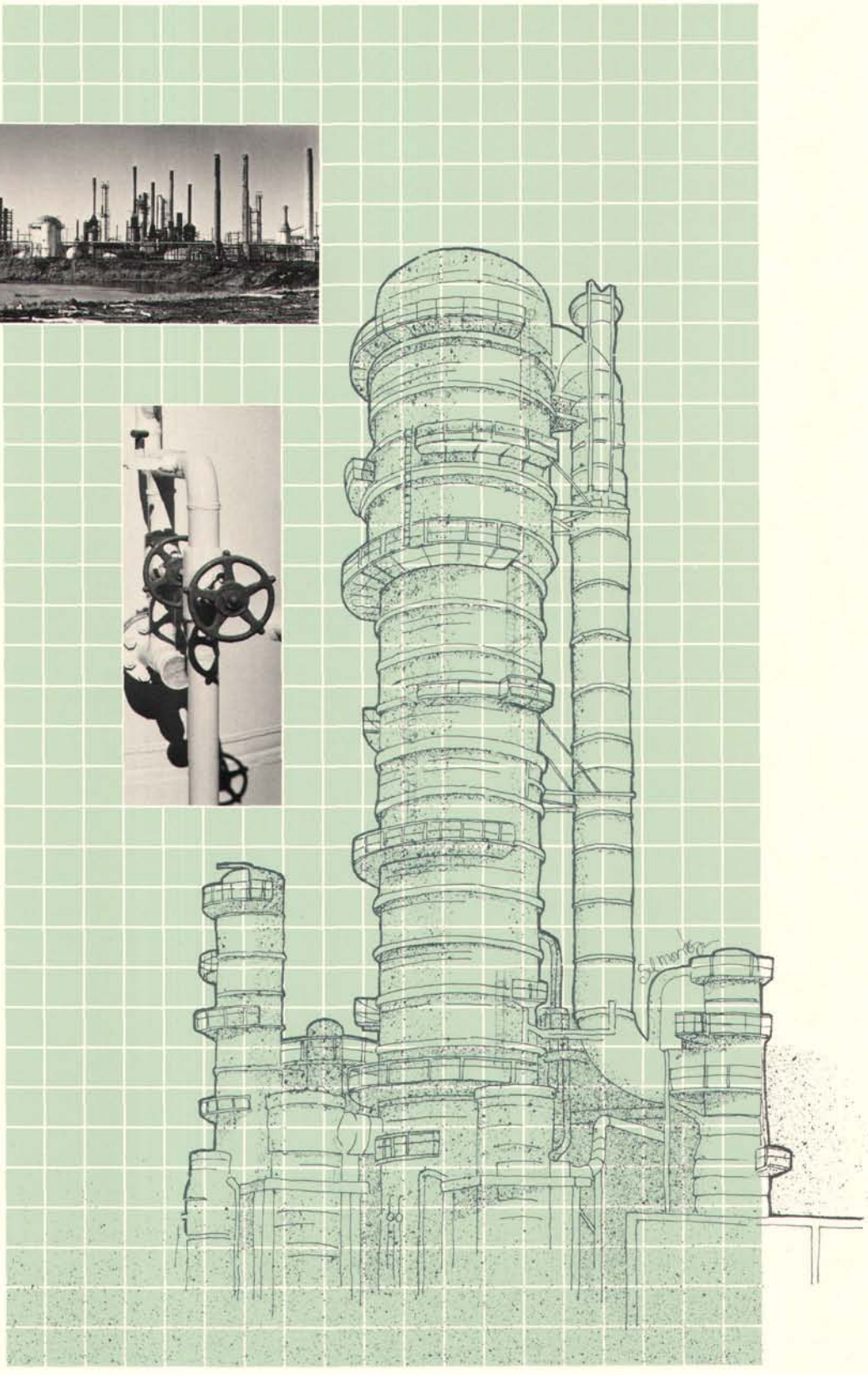
The current period can be considered a fourth phase. In the near term, much of the energy industry is expected to recover from the deep recession of 1982. Over the longer period, however, declining reserves, increasing foreign competition in energy markets and expectations of limited growth in energy prices may lead to a smaller role for oil and natural gas in the Texas economy. The challenge of providing continued economic growth in Texas, therefore, may shift to non-energy sectors of the economy.

## Emergence of the Energy Economy

The Texas economy changed fundamentally between the beginning of the 20th century and World War II. Once a largely agricultural state, Texas became much more urbanized, more mechanized, more industrialized. The process of industrialization was influenced strongly by the emerging energy industry. Major discoveries of oil and natural gas reserves helped create a large energy sector that provided employment for the growing non-agricultural population.

These two factors—reduction of the agricultural population and development of the energy sector—were responsible for much of the change in the Texas economy





during this period. Industries were created to serve oil and gas drilling and to process the oil and gas. Building and expansion of the energy infrastructure occurred during this period.

**Agriculture's decline in importance**

Agriculture was the dominant source of employment in Texas throughout this period. However, agricultural employment fell steadily (*Table 1*). The proportion of agriculture, forestry and fisheries employment declined from 62.4 percent in 1900 to only 30.3 percent in 1940. In contrast, employment in food and food processing, lumber and other manufacturing industries rose considerably during this period. The share of employment in oil and gas mining rose from 0.3 percent to 2.9 percent.

*Table 1*

Percentage Composition of Texas Employment

| | 1900 | 1910 | 1920 | 1930 | 1940 |
|---|---|---|---|---|---|
| Agriculture, Forestry, Fisheries | 62.4 | 59.9 | 46.2 | 38.4 | 30.3 |
| Oil, Gas and Mining | 0.3 | 0.5 | 1.8 | 1.6 | 2.9 |
| Manufacturing, Construction | 7.4 | 11.8 | 15.0 | 17.5 | 15.2 |
| Transportation, Communication | 4.3 | 5.4 | 7.2 | 7.4 | 6.6 |
| Wholesale and retail trade | 5.9 | 8.7 | 13.2 | 15.7 | 18.0 |
| Finance, Insurance, Real estate | 0.6 | 0.8 | 1.1 | 1.4 | 2.7 |
| Domestic and other services | 14.6 | 8.1 | 7.9 | 10.5 | 14.1 |
| Professional services | 3.6 | 3.6 | 4.4 | 5.7 | 6.7 |
| Government and Military | 0.7 | 1.2 | 2.6 | 1.8 | 3.7 |
| Total | 100.0 | 100.0 | 100.0 | 100.0 | 100.0 |

Several forces affected the transition from an agrarian economy. Mechanization and technological change led to the consolidation of farms into larger, more efficient tracts. It was claimed that each tractor replaced one to three families of farm workers. The demonstrated efficiency of mechanized agriculture led to deterioration of the tenant farmer, or sharecropper, system. As a result of increased mechanization, the number of farms decreased, their average size increased and employment in agriculture declined.

Continuation of the Industrial Revolution decreased the relative importance of agriculture. As per capita income grew, expenditures on food and fibers did not keep up proportionately. Consequently, an increasing share of income was directed toward consumer goods, boosting the manufacturing and service sectors.

Finally, the severe agricultural depression in the late 1920s and the 1930s caused net emigration from Texas—primarily from agricultural communities. Falling prices for crops and livestock forced numerous small farmers out of business, and many migrated to California.

As a result of these trends, the population in Texas became increasingly concentrated in urban centers. By 1940, 45 percent of the population lived in urban centers compared with only 17 percent in 1900.

**Important source of employment**

Energy provided an increasing share of total employment during this period. By 1939, energy employment—including employment in energy-related manufacturing—accounted for 7.1 percent of non-agricultural employment, up from 0.6 percent in 1900. From 1900 to 1940, the percentage of Texas employment in manufacturing and construction rose from 7.4 to 15.2. Although a large part of this rise was unrelated to the energy industry, growth in drilling brought about a demand for oil field equipment and fabricated metals, and provided employment in the construction of refineries, pipelines and petrochemical facilities.

The energy boom also affected the pattern of population growth during this period. In 1890, for example, Dallas was twice as large as Houston. With the discovery of substantial oil reserves in South Texas, Houston became the largest city in Texas by 1930. The development of refining also explains much of the 23-fold increase in population in Jefferson County (Beaumont-Port Arthur area) between 1890 and 1930.

Finally, the ratio of per capita income in Texas to that in the United States moved with the fortunes of the energy industry. Although income in Texas has followed national movements for the most part, per capita income has tended to rise faster in Texas than in the nation in periods in which the energy sector expanded (*Box 1*). Income in Texas rose relative to the national average in the early 1930s with increased production, fell in the mid-1930s with the Great Depression, and rose during the war with the expansion of the refining industry and the rapid development of petrochemicals.

**Discovery and extraction**

Development of the energy industry began with the discovery of major fields of oil and natural gas. Between 1900 and 1945, Texas emerged as the largest producer of oil and natural gas in the nation. Beginning with the discovery of Spindletop in 1901, reserves continued to climb. Spindletop produced more than 18 million barrels of oil in 1902—equal to 20 percent of total U.S. production that year. By 1935, reserves in Texas had risen to 50 percent of the U.S. total, following the discovery of the 5.5 billion-barrel East Texas Field in 1931—the largest discovered field in the world to that date.

Oil production followed the increase in reserves, growing rapidly between 1918 and 1945. Production grew 758 percent between 1918 and 1931 (*Chart 1*). After the institution of production restrictions by the Texas Railroad Commission between 1931 and 1935, production grew more slowly until World War II. Nevertheless, by 1945 Texas accounted for 44 percent of U.S. production and 29 percent of world production.

The oil boom during this period led to the creation of a drilling industry and other industries to support drilling. Crude technology at the turn of the century—which was not very different from the method used to drill water wells—was replaced by more sophisticated processes. Equipment specially designed for oil and gas drilling became increasingly prominent, and a manufacturing sector to produce oil field equipment developed. By 1939, 47 percent of all oil field equipment manufacturing in the United States was in Texas.

In addition to the development of more sophisticated equipment, specialization and differentiation of tasks prevailed. Firms providing seismic surveys, drilling mud, cement and logging—together with drilling services—accounted for 41 percent of all expenses incurred in procuring oil by 1939.

Natural gas also was found in abundance, often in conjunction with oil, but was treated almost as a nuisance. The lack of easily available transportation made sales difficult to all but the immediate area. Natural gas required pipelines for transmission, while oil could be moved by tanker, truck, barge or train. The relative expense of transporting the gas held wellhead prices at approximately one-fifth of the energy-equivalent price of oil. As a result, natural gas production remained low, and producers were restrained from flaring (burning off) surplus gas only by restrictions eventually imposed by the Texas Railroad Commission.

*Chart 1*

Texas Oil Production
1918–1945

(Millions of barrels per year)


**Major developments in refining and petrochemicals**

The emergence of Texas as a major energy-producing state led to the establishment of major refining and petrochemical complexes. The refinery industry in Texas appeared in Beaumont soon after the discovery of oil. Between 1896, when the first refinery opened, and 1929, 83 refineries were constructed. A significant portion of these were built in the Beaumont-Port Arthur area. The majority of Texas refineries

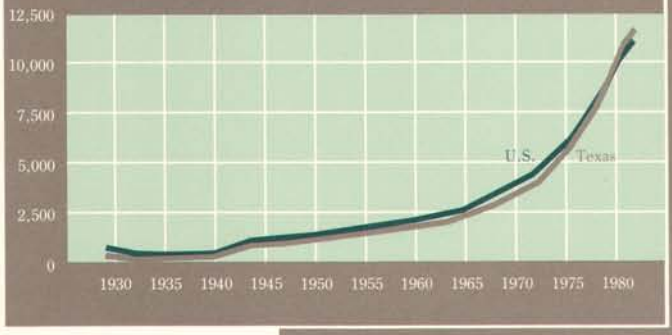
*Box 1*

## Energy and the Growth in Texas Relative to the Nation

With the possible exception of the 1970s, the energy industry has been principally responsible for Texas' deviations from the national pattern of growth, not for the overall growth rate itself. Per capita income in the United States and that in Texas follow each other very closely (*Chart B1*). Per capita income in Texas does change throughout the period relative to the national average, but the absolute levels remain fairly close. It is significant to note, however, that per capita income in Texas—which had trailed the national average—did rise above the national average in 1980 during the period of rapid energy sector growth.

*Chart B1*

Texas and U.S. Per Capita Income




In addition to a relatively stable relationship between per capita income in Texas and the nation, major business expansions and contractions have been similar in timing and magnitude. Reductions in per capita income during major postwar recessions were observed in both Texas and the nation in nearly all cases. Clearly, the popular belief that the Texas economy is less exposed to national recessions is based on the limited experience of the past 10 years and is not representative of the longer time frame.

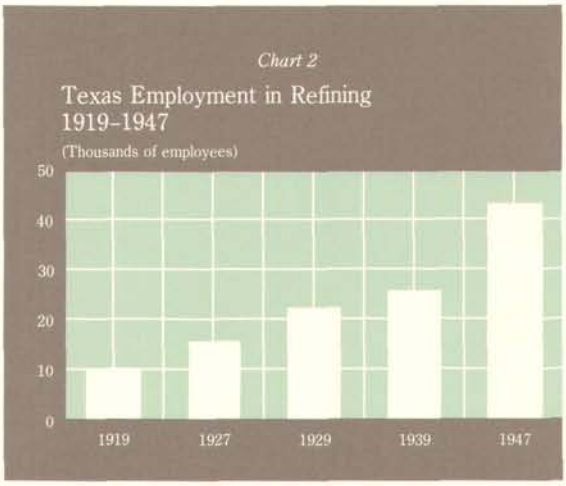
A comparison of per capita income in Texas relative to the national average provides more evidence to indicate the importance of the energy sector. Relative income has responded to changes in the share of employment in the energy industry (*Chart B2*). Between 1939 and 1955, energy employment rose from 7 percent to 10 percent of total non-agricultural employment. During this period, relative per capita income in Texas rose from 75 percent of the national average to 89 percent. Between 1956 and 1973, the share of energy employment declined, but relative per capita income did not change as per capita income in both the United States and Texas grew at the same rate. A major increase in the share of energy employment between 1973 and 1981 and the decline in energy's share following 1981 were matched by similar movements in relative income in Texas.

*Chart B2*

Per Capita Income of Texas Relative to U.S. and Texas' Share of Non-agricultural Employment in Energy

*Chart 2*

Texas Employment in Refining
1919–1947

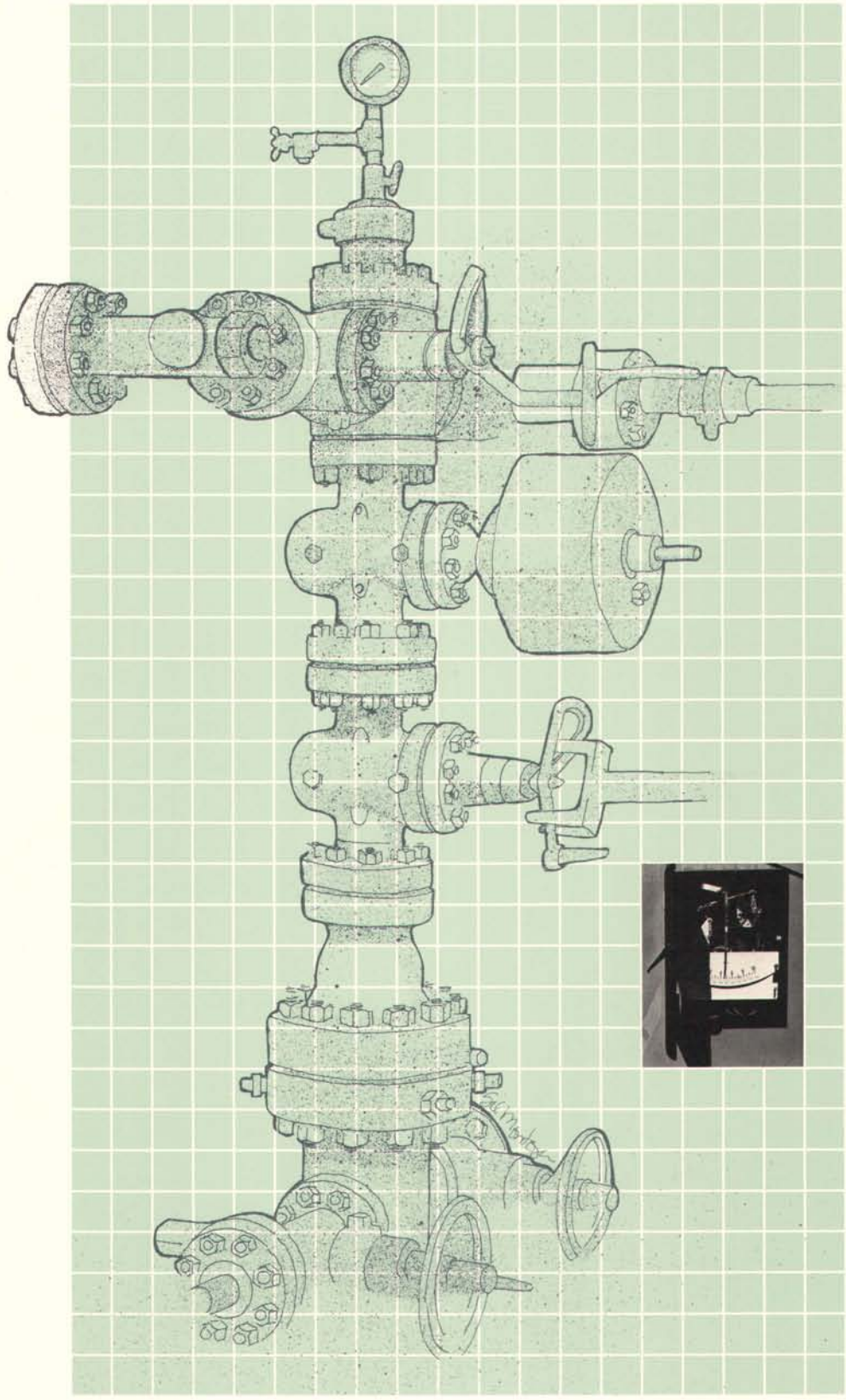



were situated along the Gulf Coast to be close to the source of supply and to reduce the cost of transporting refined products to the East Coast.

Refining quickly became a major source of employment and value added. Refinery employment rose rapidly after 1919, increasing 170 percent between 1919 and 1939 (*Chart 2*). Value added also rose at a rapid rate after 1919—rising 151 percent by 1939 and 615 percent by 1947. By 1939, Texas plants refined over 34 percent of all domestically refined crude oil. Refining was the most important manufacturing industry in the state. By 1939, refining accounted for 15 percent of total manufacturing employment and 27 percent of value added by the manufacturing sector in Texas.

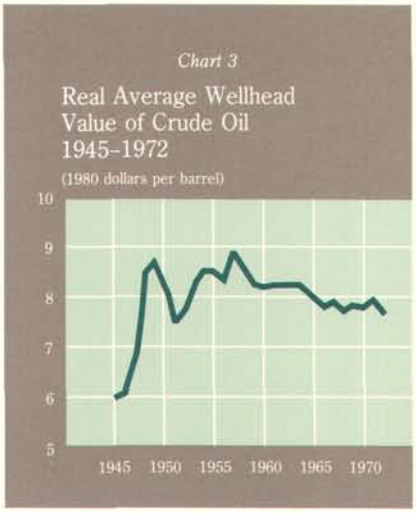
The growth of refining was driven by major technological changes. Initially, the principal refined product was kerosene for lighting and heating. Later, the rapid expansion of automobile use led to more emphasis on producing gasoline. World War II brought a surge in demand and an expansion in the number of refined products. Production, which had slumped during the Depression, expanded 25 percent between 1942 and 1945. Gulf Coast refineries took the lead in developing new products, which included high-octane aviation fuel, asphalt, lubricants and toluene used in dynamite.

World War II also sparked the development and rapid expansion of the petrochemical industry. Because naturally occurring commodities were not available in sufficient quantities for the war effort, a wide range of products derived from oil and natural gas feed stocks (raw materials) were created. Production of synthetic rubber, explosives, fibers and plastics increased dramatically during the war. An industry that had been virtually nonexistent prior to the war employed 12,000 workers by 1947. Most of the petrochemical plants were built near refineries to ensure dependable and inexpensive sources of petroleum and natural gas products.



## Energy Industry Growth Slows

Following World War II and before 1973, the energy sector became less prominent relative to the rest of the Texas economy. Oil and natural gas production continued to rise, as did refinery and petrochemical plant capacity. However, the share of employment contributed by the energy sector fell, even though the agricultural proportion of total employment fell from 30 percent in 1940 to 4 percent in 1970.



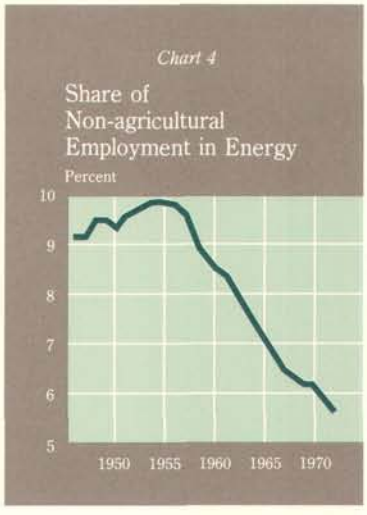

Two factors account for this decrease. First, increased federal expenditures on defense and major innovations in electronics provided important additional sources of employment in Texas outside the energy sector. Electronics, aerospace and service industries grew, making the Texas economy generally less dependent on energy as a source of new employment.

Second, growth of employment in energy was restrained. Production restrictions imposed by the Texas Railroad Commission had the effect of maintaining virtually constant nominal oil prices in the United States. After adjustment for inflation, oil prices fell (*Chart 3*). Partly because of this fall in inflation-adjusted oil prices, the share of employment in energy industries declined relative to employment in other industries in Texas.

**Economy diversifies**

Employment in the energy industry became a smaller share of total non-agricultural employment during this period (*Chart 4*). Manufacturing employment rose rapidly—146 percent between 1947 and 1972—becoming the major source of employment. The largest increases within manufacturing were in instruments—which rose 834 percent—and electronics. Transportation equipment also grew considerably.

Part of this movement to manufacturing was the result of growth in the defense industry. Technological innovations and increased outlays for national defense, especially during the Vietnam War, encouraged the development of electronics and aerospace manufacturing, transportation and services in Texas. The value of shipments from Texas manufacturers to the Department of Defense rose from $716.7 million in 1963 to a peak of $4.0 billion in 1968—constituting 14 percent of the value of all shipments by Texas manufacturing industries. With the diminishing U.S. involvement in the Vietnam War, this share fell to only 4 percent by 1972.




Electronics became particularly important to the state economy. The invention of the integrated circuit, which occurred in Texas, provided the impetus for a growing national center in electrical equipment. Electric and electronic equipment employment grew from 1,900 workers in 1947 to 54,600 in 1972, increasing from 0.7 percent to 7.5 percent of total manufacturing employment. Some of the leaders in this process, it should be noted, first developed as energy firms. Texas Instruments, for example, began as a geophysical company serving the energy industry before turning its chief production concerns to the electronics industry.

Throughout this period, professional and financial services also rose dramatically. Between 1950 and 1970, these services rose from 6.5 percent of total employment to 16.1 percent.

*Chart 5*

## Energy Employment by Activity

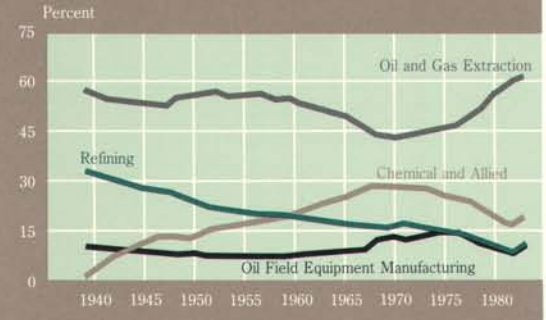



*Chart 6*

## Texas Oil Production 1946–1973

(Millions of barrels per year)


*Chart 7*

## Texas Natural Gas Production

(Trillion cubic feet per year)

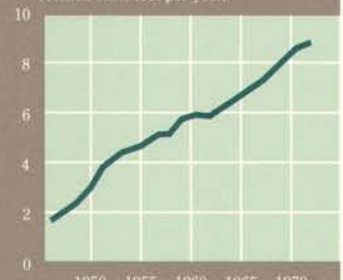



*Chart 8*

## U.S. Rotary Rigs Running


*Chart 9*

## Allowable Oil Production Percentages in Texas 1946–1972

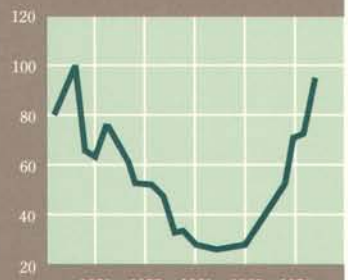
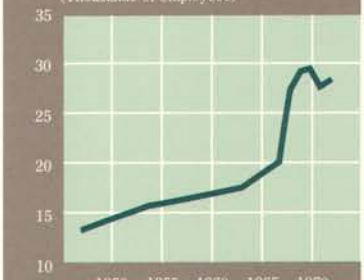



*Chart 10*

## Texas Employment in Oil Field Equipment Manufacturing

(Thousands of employees)



**Composition changes**

Although the share of employment in the energy sector fell after 1955, not all industries within the sector declined. Oil and gas extraction employment declined in proportion to energy employment, but employment in petrochemicals and oil field equipment increased in importance (*Chart 5*).

Oil and gas production rose throughout most of the period. Oil production increased 71 percent between 1946 and 1972 (*Chart 6*). The natural gas industry also developed rapidly in Texas. Production increased over 400 percent between 1945 and 1972 as a result of improved transportation networks and growing demand (*Chart 7*). Consumption of natural gas in the nation rose almost 500 percent during this period. As the usefulness of natural gas became more evident, major pipelines were built to bring the natural gas to refineries, petrochemical plants and utilities along the Gulf of Mexico and to the East and West Coasts.

Despite these increases in oil and natural gas production, drilling fell sharply after 1955. This led to a decline in oil and gas extraction employment. The U.S. rig count fell from an average of over 2,500 rotary rigs in 1955 to fewer than 1,000 rigs in 1971 (*Chart 8*). The decline in the rig count in the midst of increasing production is explained to a large extent by disincentives to drill resulting from production restrictions imposed by the Texas Railroad Commission (*Box 2*). Production was restricted on existing wells to less than 30 percent of the amount that could be efficiently produced from existing wells in the early 1960s (*Chart 9*). With prices remaining unchanged and the production limits on existing wells very stringent, there were few incentives to drill additional wells. Increased production was accomplished through gradual lifting of controls, rather than production from new wells.


Despite a declining Texas and U.S. rig count, the manufacturers of oil field equipment prospered. By the 1960s, Texas was the nation's major supplier of equipment and a significant source of equipment for the rest of the world. Decreases in Texas oil field activity were more than offset by increases in drilling outside the United States. Employment in oil field equipment grew from 13,446 in 1947 to 27,541 in 1972 (*Chart 10*).

Although total energy industry employment declined after 1957, output from the refining and petrochemical industries continued to grow. Employment in refining fell after 1953, but that trend reflected increasing capitalization rather than declining production. Value added in refining rose 270 percent between 1947 and 1972. The relatively new petrochemical industry also continued to record steady growth in output (*Chart 11*). Increased use of plastics and rubber supported the expansion. In fact, by 1958 the petrochemical industry contributed 14 percent of total value added in manufacturing, surpassing the contribution of the refining industry.

*Box 2*

### The Role of the Texas Railroad Commission

The discovery of the massive East Texas Field provided the impetus for enlarging the power of the Texas Railroad Commission (TRC) to make it one of the most powerful organizations in the world. Immediately following the discovery in 1930, a large number of oil companies converged upon the tract. Between 1930 and 1933, 24,940 wells were drilled in East Texas. The resulting increase in production drove prices down as low as 10 cents per barrel. The ensuing chaos prompted Governor Sterling to call out the National Guard to impose order on the field. The Texas Legislature responded by granting the TRC the right to regulate the production of oil.

Two reasons were cited in the decision to control production. First, oil production is facilitated by either water or natural gas pressure within the oil reservoir. If production occurs too rapidly, the pressure falls and total recoverable oil declines. Without clearly defined property rights to a resource that shifts its location relative to the surface, no individual producer has the incentive to regulate the rate of production to achieve the maximum cumulative output. Government-imposed production controls are one way of regulating the rate of production to obtain the maximum recoverable reserves. Second, maintaining higher and stable prices was generally in the interest of the government and the oil producers, but the enforcement power of the government was required to ensure compliance by all producers.

To accomplish these goals, the TRC implemented prorationing of oil fields. The TRC first determined the maximum efficient rate of production, which is defined by the quantity that can be produced without prematurely breaking down the geologic formation containing the oil. Prorationing then limits the production of each well in a given field to a percentage of this "maximum efficient rate." Determination of the percentage is based on the expected demand for oil. Each refinery estimates the quantity of oil it will require in a period, given the price of oil at the time. The TRC then sets the percentage to match that demand.

This process results in higher than free-market prices because of the imposed reduction in output but spreads production over a longer period of time. Because of the large share of total production originating in Texas, the TRC was able, in effect, to set the price of oil in the United States and in much of the world by manipulating the percentage of allowable production.

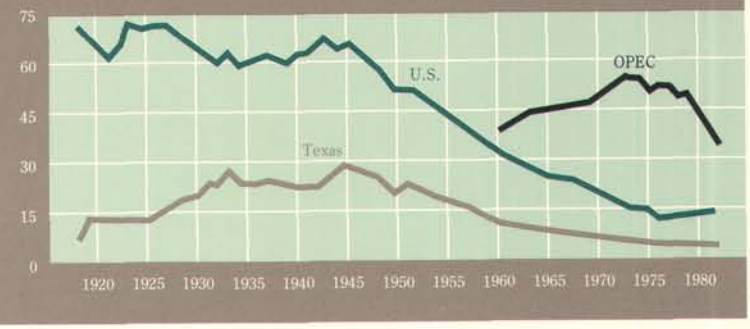
**The power of the TRC**

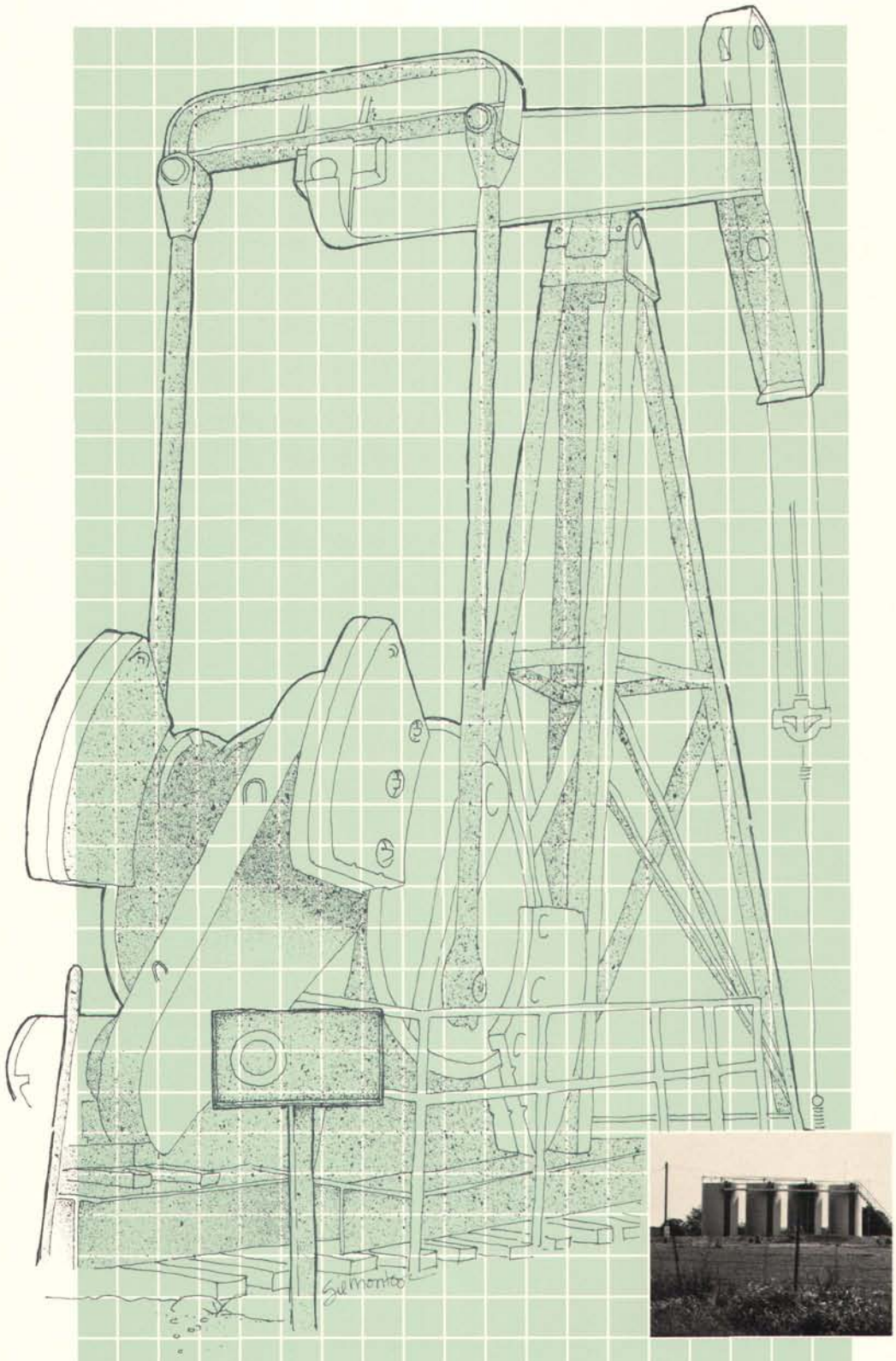
The TRC was able to hold prices for Texas producers constant before 1973 through production limits. This power to hold prices constant ebbed during the 1960s and early 1970s. Competition, especially from the emerging OPEC cartel, steadily increased the world's supply of oil and decreased the share of oil originating in Texas. Oil production in Texas rose throughout this period, increasing 50 percent between 1950 and 1970. Nevertheless, Texas' share of world production fell. Texas produced 21 percent of the world's total in 1950 but produced only 12 percent in 1960 and 9 percent in 1970 (*Chart B3*). The largest increase was in production by OPEC, rising from 9 percent of the total in 1960 to 56 percent by 1973.

Although world oil reserves grew rapidly in the 1950s, 1960s and early 1970s, consumption grew even faster. In the United States, for instance, oil consumption rose 226 percent between 1950 and 1970. During this period, the TRC controlled production in the state to maintain a constant price of oil but one that was higher than would have prevailed without TRC production controls. To keep the price of crude oil from rising as demand grew faster than supply, the TRC gradually increased the percentage of allowable production from less than 30 percent in the early 1960s to 100 percent in 1972. This easing of restrictions increased oil production in the state, but when allowable production reached 100 percent of the maximum efficient rate, the TRC no longer affected market prices.

*Chart B3*

Percent of World Oil Production





## The Period of Oil Price Increases

While the energy industry had declined in importance, it still accounted for a larger share of activities in Texas than in other states. As a result, the strength of the Texas energy industry helped the state's economy achieve higher rates of growth than the rest of the nation in the 1973–83 phase. The sharp oil price increases in 1973 and 1979 fueled strong growth in the energy sector and increased its share of Texas economic activity. Because of the sharp rise in oil prices, the diversification away from energy begun in the previous phase was reversed. Consequently, growth in the Texas economy paralleled the state's energy industry more closely than in any of the earlier phases.

*Chart 12*

Texas and U.S. Industrial Production Indexes
(1967 = 100)


Toward the end of this period, however, the heavy reliance on energy hurt the Texas economy. A major recession in the drilling industry that started at the beginning of 1982 pushed Texas into its worst economic recession since the Great Depression. Furthermore, the continued weakness of oil prices and world oil demand restrained recovery in the energy sector and held the state's recovery behind the nation's.

### Dependence on energy increases

Between 1973 and 1983, the Texas economy reflected the fortunes of the energy sector. Spurred by a rapid expansion of the energy industry, industrial production in Texas grew rapidly relative to industrial production in the nation. Industrial production in Texas doubled during this period, while the nation's industrial production rose only 20 percent (*Chart 12*). Per capita income in Texas rose from 11 percent below the nation's average in 1973 to 2 percent above the nation's average by 1980.

Besides expanding more rapidly than the nation's economy, the Texas economy became increasingly dependent on the energy industry. The energy sector's share of employment rose from 5.7 percent in 1973 to 7.9 percent by 1981. The importance of energy to the rest of the Texas economy also grew during this period. Between 1967 and 1979, the share of total sales by all firms in Texas accounted for by the energy industry rose more than 3 percentage points. Furthermore, the proportion of total sales accounted for by non-energy manufacturing firms fell over 2 percentage points between 1967 and 1979 (*Table 2*). Wholesaling—which relies heavily on transactions with the energy industry—had a large increase in sales, while retailing—which does considerably less business with energy firms—decreased its share of total sales.

*Table 2*

Percent of Total Sales by Texas Economic Sector and Subgroup[1]

| | 1967 | 1979 |
|---|---|---|
| Energy | 13.38 | 16.40 |
| Manufacturing | 24.35 | 24.92 |
| Manufacturing, less petroleum refining, organic chemicals and mining equipment manufacturing | 16.56 | 14.17 |
| Wholesale Trade | 3.87 | 5.14 |
| Retail Trade | 5.82 | 3.68 |
| Services | 5.12 | 5.50 |
| Local, State and Federal government (plus education) | 9.42 | 8.46 |

[1]Excluding sales of labor to businesses by households

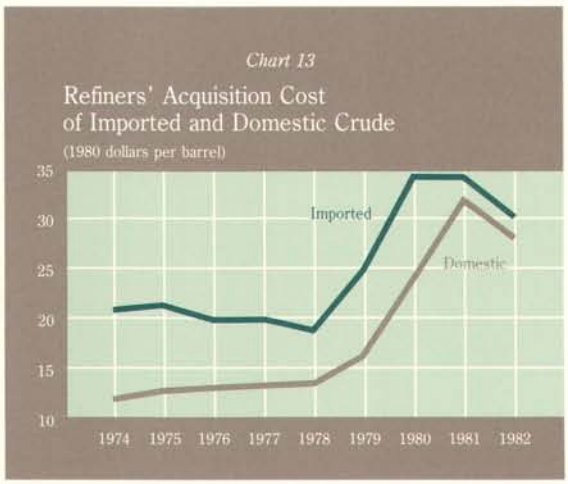
In addition to accounting for a larger share of the Texas economy, the energy sector had a greater impact on overall economic growth. For example, after adjustment for the effect that oil production had on firms supplying products or services to oil firms (such as creating jobs), the production of a dollar's worth of oil by a Texas oil extraction firm for final use had an economy-wide impact of $1.43 in 1979. This "multiplier effect" was up 17 percent from 1967, when a dollar's worth of oil pro-

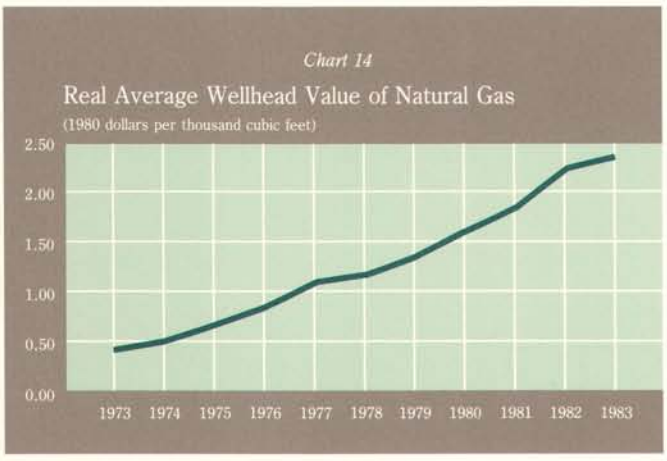
duction had an economy-wide effect of only $1.22. This increased multiplier effect reflects the growing infrastructure to serve the energy industry in Texas. Increases in multiplier effects also were registered in gas extraction, oil and gas services, organic chemicals and mining equipment. Only refining's multiplier fell between 1967 and 1979, reflecting an increased reliance on imported oil and decreased production of crude oil in Texas.

**Oil field activity shaped by oil prices and regulation**

The strength of oil field activity in Texas was a direct reflection of the price increases in world oil markets and the resulting changes in federal price regulations. Drilling responded positively to the price increases. Although federal price controls—which kept the domestic wellhead price well below the international price—limited the response to some degree. Shortages and increased emphasis on domestic production of oil and natural gas eventually led to the phased decontrol of oil and natural gas prices. The decontrol, in turn, put the energy sector into a more exposed position toward the end of the period, allowing a more pronounced response to the 1979 oil price increase than to the 1973 increase. When prices respond to market conditions rather than to changes in regulated prices, the price paid to domestic producers moves with prices in the world market.

The beginning of the drilling boom began with the OPEC embargo and the doubling of oil prices in 1973. Although the effect on domestic oil production was dampened to some extent by domestic price controls, prices began to rise for oil and natural gas. The price paid to domestic producers by refineries was below the price refiners paid for imported oil, but the gap narrowed between 1974 and 1979. During this period, refiners' acquisition costs for domestic crude oil rose 35 percent after adjustment for inflation (*Chart 13*). The inflation-adjusted price of natural gas also rose during the period, increasing 163 percent (*Chart 14*).




Rising oil prices, however, began to expose problems with federal energy price regulations especially in the natural gas market. A dual pricing system had been established through a series of regulations. Natural gas transported through intrastate pipelines was not regulated, and gas transported through interstate pipelines was. This difference in price flexibility caused a differential to emerge in prices paid by pipeline companies for gas at the wellhead. Because the intrastate market was unregulated, prices were able to rise well above the price paid by interstate pipelines even though these pipelines could not purchase enough gas to meet demand. Consequently, shortages appeared in the interstate market.

Shortages of natural gas and a federal policy aimed at achieving energy independence resulted in major legislative reform in 1978. Oil prices were scheduled for phased decontrol between 1978 and 1981, with new oil discoveries immediately deregulated. Natural gas prices were scheduled for phased deregulation between 1978 and 1985 in the Natural Gas Policy Act (NGPA) for approximately half of the sources of natural gas. As was the case with oil, gas that was difficult to acquire and more expensive to produce was deregulated almost immediately to encourage its production. Furthermore, to eliminate the shortages in the interstate market, gas committed to the intrastate market also was brought under price regulations.

With decontrol set into motion, the 1979 price increase accompanying the Iranian revolution led to a major increase in drilling (*Chart 15*). Oil prices rose more than 270 percent between 1978 and 1981, while natural gas prices rose 200 percent (*Charts 13, 14*). Drilling for oil and natural gas increased sharply, from an average of 2,259 active rigs in 1978 to a peak of 4,525 by the end of 1981 (*Chart 16*). Drilling in Texas followed the national pattern, rising from 855 rigs to 1,449 during this period.

Higher oil prices again boosted the demand for natural gas. Because prices for much of the gas could not rise as a result of price ceilings in the NGPA, the increased demand for natural gas was met by the higher-cost sources that were exempt from controls. Completions of unregulated deep gas wells—below 15,000 feet—rose 20 percent between 1980 and 1981.

Following the rapid increase in oil and gas prices, pressure began building for a price decline in early 1981. The worldwide recession and higher oil prices significantly reduced oil consumption. World consumption of oil fell from 62.6 million barrels per day in 1979 to 52.5 million barrels in 1983. Higher prices resulted in conservation and fuel-switching investments in industrial countries that permanently reduced their oil-to-GNP ratios. The problem of declining consumption in foreign countries was aggravated by the appreciation of the dollar against other currencies, which caused the price of oil—quoted in those currencies—to rise even further (*Chart 17*).

*Chart 15*

Indexes of U.S. Rig Count and Average Wellhead Price of Crude Oil

(1980 = 100)

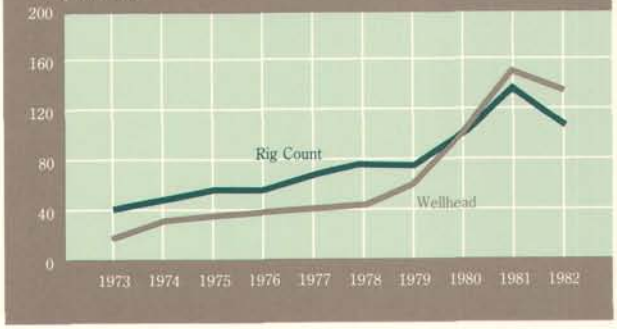



*Chart 16*

U.S. Rotary Rigs Running 1974–1983

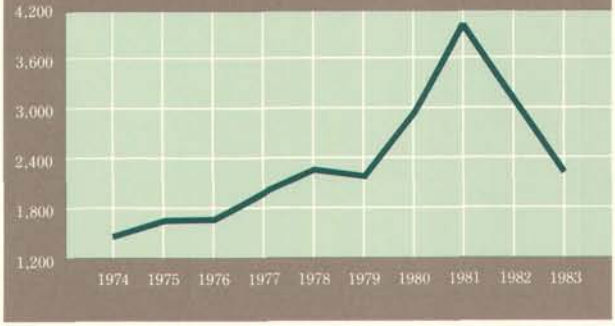
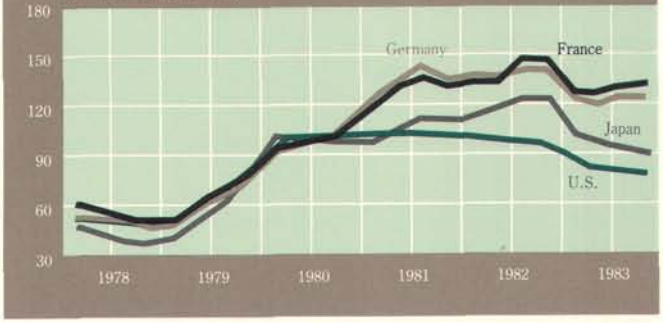


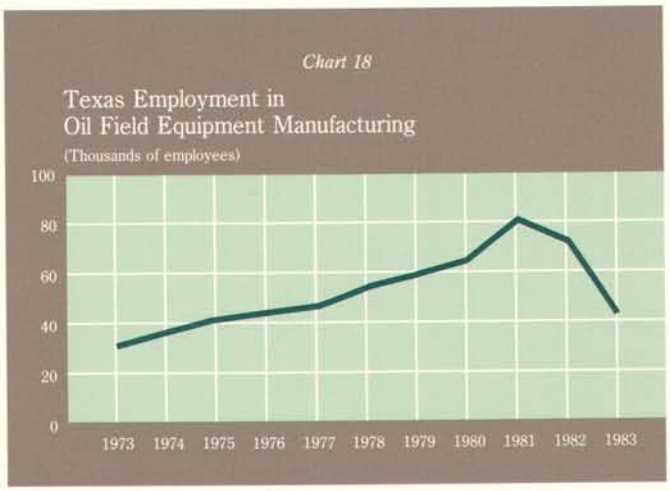

*Chart 17*

Indexes of Real Oil Prices

*as seen in each country's currency*

(Quarterly, 1980/Q1 = 100)






Declining consumption and the gradual restoration of Iranian and Iraqi production in 1981 put downward pressure on the price of oil. Beginning in February 1981, the dollar-denominated international price of oil began to fall in both inflation-adjusted and nominal terms. With the rising dollar, however, the currency-adjusted price for most European countries continued to rise through 1982.

Declining prices did not immediately affect the energy industry. Expectations about future prices—which were based on a belief that consumers were not able to significantly reduce their consumption of energy with rising prices—were not quickly revised. With the remainder of the national economy entering a recession, the still-growing energy sector became a popular target for investment. Only with the growing evidence of the inevitability of a decline in prices did drilling finally collapse at the beginning of 1982—nearly a year after prices began to fall.

The collapse began in deep gas drilling and quickly spread. Falling oil prices reduced natural gas consumption. Because deep gas was the marginal source of gas—receiving prices nearly triple regulated prices—deep gas drilling was the first to decline. The remainder of drilling quickly followed suit, and the national rig count fell 60 percent by April 1983. Employment in oil and gas field extraction dropped 20 percent as the rig count in Texas fell 51 percent between December 1981 and April 1983.

**Following the drilling pattern**

The manufacturing sector dedicated to producing equipment for oil and gas extraction reflected the boom-bust cycle of drilling. In the early part of the 1970s, the oil field equipment manufacturing industry in Texas consolidated its position as the major supplier of equipment to the nation and to the world. In 1977, Texas produced 70 percent of the nation's supply of drilling equipment.

The rise in drilling in Texas, the United States and the world boosted employment and production in the oil field equipment manufacturing sector. This industry registered an increase of more than 200 percent in employment between 1973 and the end of 1981 (*Chart 18*).

With the collapse in drilling at the beginning of 1982, however, the oil field equipment manufacturing sector was particularly hard hit. Large, undesired inventories of equipment caused by the sudden decline in demand led to major layoffs. Some of the large primary metals firms that had specialized in manufacturing drill pipe significantly reduced employment and output in 1982. Employment in oil field machinery dropped 50 percent between December 1981 and early 1984.

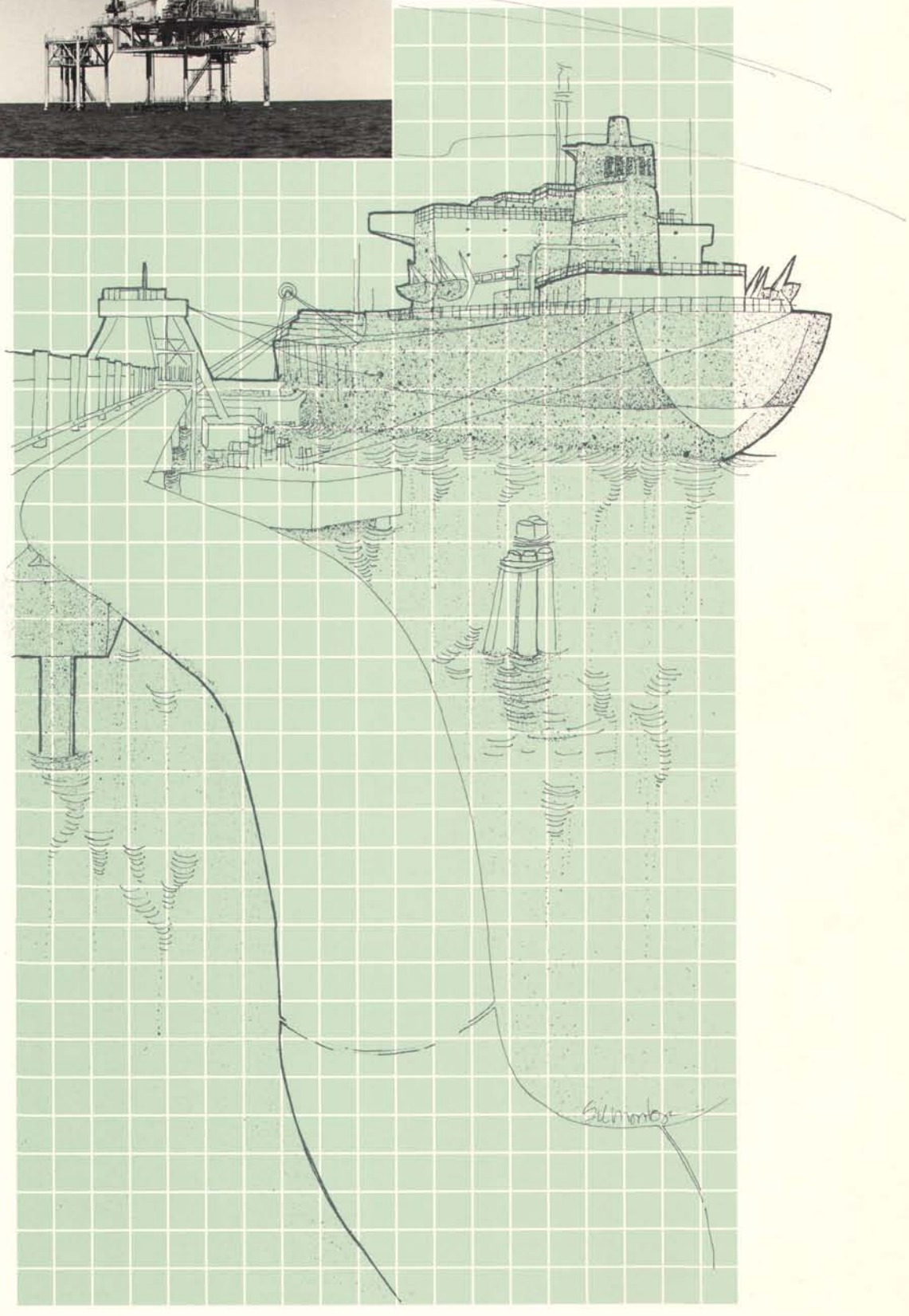
**Effects of federal policy**

Although the major oil price increase in 1973 would have been expected to reduce demand for refined products and petrochemicals, federal regulations helped reverse the effect. The elimination of federal regulations in 1978, however, along with the drop in demand following the 1979 oil price increase dimmed the fortunes of these two industries in Texas.

Despite higher oil prices, consumption of refined products and petrochemicals climbed between 1973 and 1979. Refined product consumption rose 10 percent, while petrochemical output rose 30 percent. With the decline in consumption of refined products in 1980, however, refining production fell, causing the closure of 83 refineries nationwide.

Federal price regulations helped shelter the refining and petrochemical industries from the effect of higher prices. Because oil price controls kept the acquisition cost of domestic crude low, domestic refiners had a cost advantage over foreign refiners. Natural gas price controls gave the petrochemical industry in Texas an advantage over many other parts of the country. The availability of abundant sources of natural gas on the intrastate market for use as feed stocks encouraged development of new petrochemical facilities in Texas. On the other hand, parts of the country dependent on interstate supplies of natural gas faced potential interruptions in supply during periods of shortage.

These regulatory side benefits to the refining and petrochemical industry were eliminated following the removal of oil price controls and the passage of the NGPA in 1978. The rise in product prices caused a decline in consumption. Employment in the refining and petrochemical sectors fell. Between the end of 1981 and the end of 1983, employment in refining dropped more than 8 percent.



## A Recovery Dominated by Non-energy Industries

The economic recovery in Texas has been dominated by non-energy industries. The energy sector has begun to recover slowly as inventories of equipment have been used and economic growth has increased the consumption of refined products.

The domination of economic growth by non-energy industries is expected to continue through this recovery. Given current expectations of falling real prices for oil and natural gas, energy extraction industries probably will not contribute heavily to the growth of the economy in the near future. Resurgence in demand for refined products and petrochemicals should help those sectors, but the oil field equipment industry is not expected to recover quickly. Given the continued expansion of non-energy-related industries, therefore, the Texas economic recovery is most likely to reflect growth in those activities.

**Recovery driven by non-energy industries**

The latest economic recovery in Texas has been propelled by residential and non-residential construction, defense expenditures, and investment in plant and equipment. Energy-related industries slowed the overall rate of recovery. Although non-agricultural employment in Texas bottomed-out in April 1983, two months after the U.S. employment trough, the state's energy-related employment continued to fall for several months. The Texas industrial production index (TIPI) reached its trough in November 1982, the same month in which the U.S. index did, but mining production (a category of the TIPI) fell for an additional four months.

Construction and construction-related manufacturing industries (lumber and wood products, stone, clay and glass) led the recovery in Texas. In the fourth quarter of 1982, housing permits were 83 percent above the previous year's level. Increases in defense contracting also helped spur the Texas economic turnaround. Between 1981 and 1982, Texas manufacturers' shipments to the Department of Defense rose 13.7 percent.

The electronics industry—which is tied to both defense and non-military markets, such as computer equipment—also has been important during the recovery. Electronics and related products as a portion of capital investment have risen from 16 percent in the mid-1960s to 49 percent in 1983. The capital investment increases accompanying the U.S. recovery, together with a significant increase in the share of capital investment in computers and other microchip-based products, resulted in major gains in electric and electronic equipment production in Texas during the recovery.

These non-energy sectors should continue to stimulate growth in the state. Although growth in housing construction has begun to fade, the balance of the upturn will be led by the other non-energy industries that helped to start it. Planned increases in defense expenditures should provide a source of continued growth. National defense expenditures in fiscal year 1985 are projected to be $272 billion and are expected to rise 14 percent in 1986. Defense-related purchases of goods and services in Texas, therefore, are expected to rise in 1985 and 1986.

**Slow recovery likely for energy**

In the absence of a major oil price change, it is reasonable to assume that the recovery in the energy industry will remain weak in several key sectors. The consumption of petroleum products should increase with lower prices. Even with such increases, refining and extraction-related sectors probably will remain sluggish.

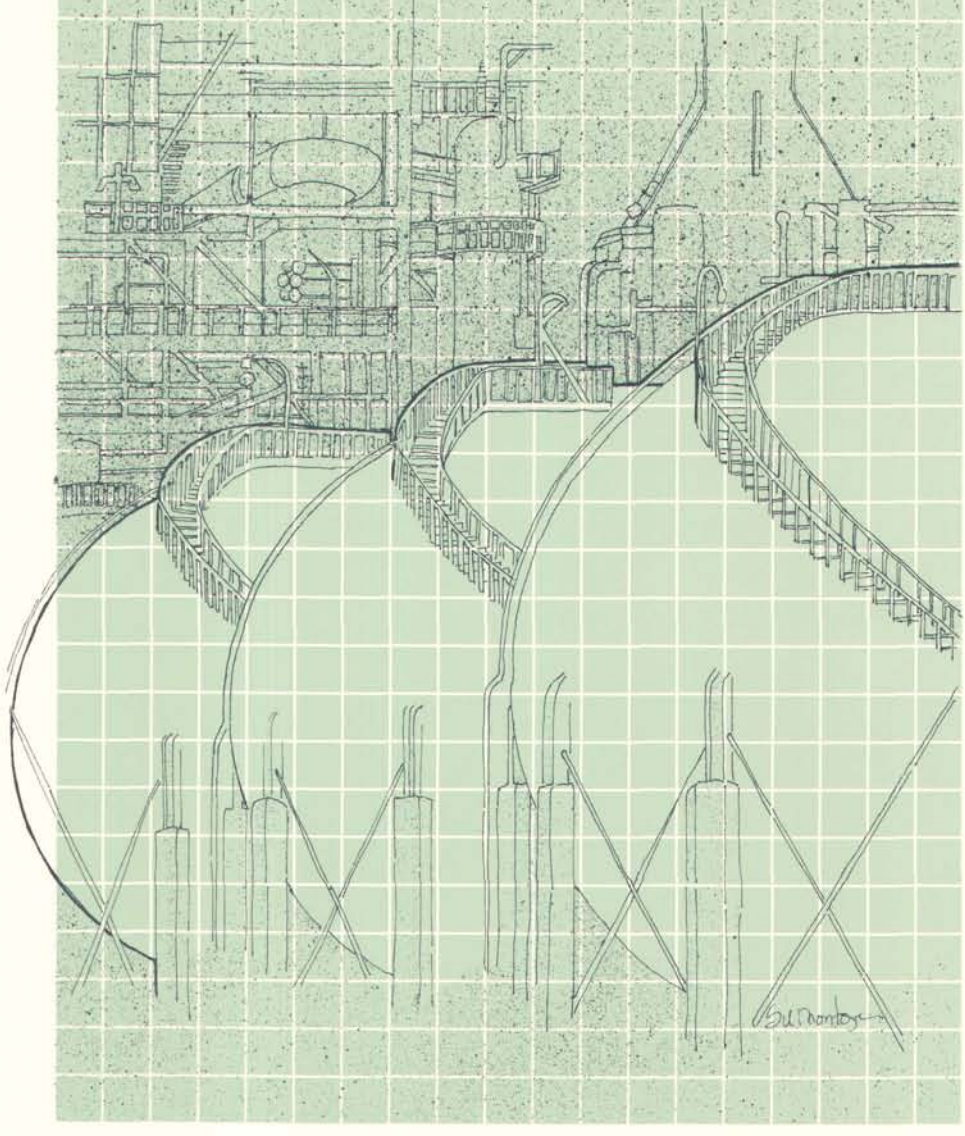
Reduction in real oil prices and a continuation of the economic recoveries in the United States and Europe should further boost consumption of energy-related final products. Although conservation and energy efficiency technologies will continue to

be incorporated into the economy—especially in automobiles and housing—the sharp declines in consumption evident from 1980 to 1982 are not likely to be repeated. With industrial expansion brought about by the national recovery and declining relative costs for energy, demand should continue to expand.

A strong expansion is not expected for the segments of the energy industry that depend on extraction. Drilling should continue to be a profitable industry, but the rate of drilling is not likely to return to the record levels of 1981 unless oil or natural gas prices rise dramatically. Increased lease sales on offshore tracts should bolster offshore drilling in the Gulf of Mexico. Decontrol of natural gas—especially if it is extended to gas from older fields—may result in higher average wellhead prices for Texas fields, increasing incentives to drill for natural gas. Nevertheless, falling real world oil prices may restrain drilling.

With the limited growth expected for drilling worldwide, the outlook for the oil field equipment industry is mixed. For the most part, manufacturers of oil field equipment should experience some growth because the high inventories present at the time of the drilling collapse have been used. Increasing foreign competition in the drill pipe industry and the low rig utilization rate, however, may keep the local industry from recovering to its 1981 level.

The increase in consumption of petroleum products will not be large enough to increase employment in Texas refineries. Excess world refining capacity will continue to hamper the industry. This may be aggravated by the completion of export refineries in OPEC countries.



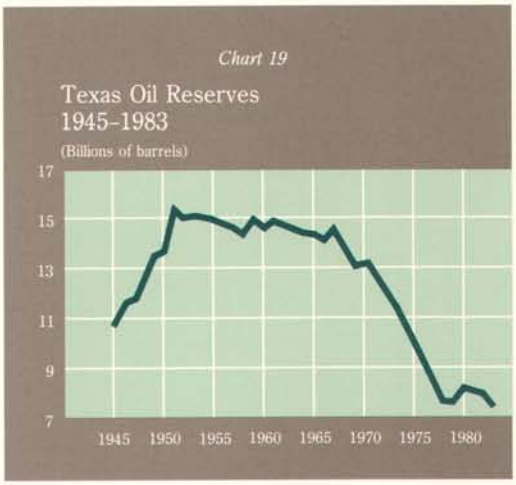
## Long-term Outlook: Growth in Non-energy Sectors to Replace Energy

Over the longer run, the importance of energy to the Texas economy probably will diminish. Barring major price increases for oil or natural gas, the trends of falling production and reserves in both oil and gas are expected to continue. Increasing competition for oil field equipment manufacturing and oil field services from oil-exporting countries may challenge the state's strength in those areas. The development of major petrochemical and refining industries by OPEC members and other countries is likely to put increased pressure on Texas firms. Nonetheless, although these forces will limit the prospect for significant growth, the energy sector will likely remain an important part of the economy through the end of the century.

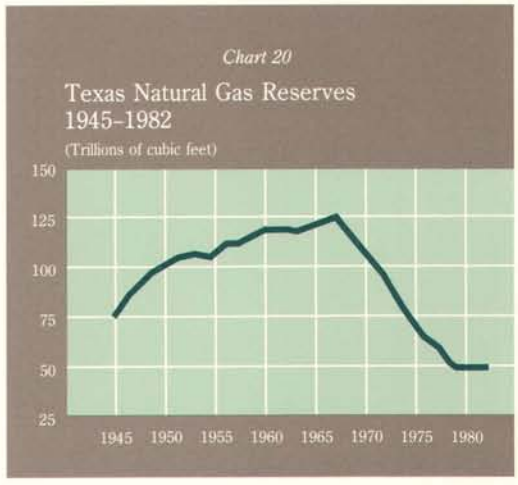
The decline of energy as a major source of economic growth in Texas does not imply that the state's economy will stall. Expanding computer and high-technology industries may keep the growth of the Texas economy above the nation's. The decline does mean, however, that the Texas economy will depend increasingly on non-energy industries.

**Reserves declining but still considerable**

A major determinant of the importance of energy to the Texas economy in the future will be the level of oil and natural gas reserves. Since the early 1970s, production has exceeded additions to reserves. Proven reserves of oil in Texas have shown a nearly continuous decline since 1967, falling from close to 14.5 billion barrels to around 7.6 billion barrels by 1983 (*Chart 19*). Natural gas reserves also have fallen, from 125 trillion cubic feet in 1967 to 50 trillion cubic feet by 1982 (*Chart 20*). As discussed earlier, these declines in reserves have led to reduced production of both oil and gas in Texas. Oil production has fallen from 3.6 million barrels per day in 1972 to the current level of 2.5 million barrels. Natural gas production has fallen from 8.7 trillion cubic feet per year in 1972 to 6.5 trillion cubic feet per year in 1982.




The relatively rapid decrease in reserves may cause an even faster drop-off in production. The reserves-to-production ratio—which indicates the number of years current production levels can be sustained with current proven reserves—has been falling for both oil and natural gas. The Texas ratios of reserves to production for oil and natural gas are now well below the national averages and may begin to impose a larger constraint on production.




Despite this outlook for declining production, Texas can be expected to remain an important domestic producer of oil and natural gas. Proven reserves are declining but remain considerable. The U.S. Geological Survey, for example, estimates that with current technology and prices, economically recoverable resources may be three to five times the level of currently claimed proven reserves. Emerging improvements in drilling technology probably will increase this figure, especially in offshore fields. Furthermore, any rise in oil prices brought about by the gradual depletion of oil reserves worldwide also will increase the amount of oil and natural gas reserves considered economically recoverable.

*Box 3*

## Severance Taxes in Texas

The period between 1973 and 1983 was characterized by a major growth in the importance of oil and gas severance taxes in Texas. Tax collections mirrored the pattern of oil and natural gas prices. The tenfold increase in oil prices during the 1970s caused the severance tax collections to become the second largest source of revenue for the state government by 1982.

Oil and gas tax rates throughout this period were set at 4.6 percent and 7.5 percent of the value of oil production and gas production, respectively. Although the production of oil and natural gas fell substantially during the period, revenues to oil and gas producers rose sharply (*Charts B4, B5*). Consequently, tax revenues rose from $332.4 million in 1973 to $2.4 billion in 1982 (*Chart B6*). As a share of total tax collections, the severance tax rose in importance, increasing from 12.9 percent to 27.4 percent, over the same period. This major increase in severance tax receipts, in turn, enabled Texas to support the growth in government expenditures without raising other taxes.

The decline in oil prices beginning in 1981 and in natural gas prices in 1983, on the other hand, caused a reduction in severance tax revenues in fiscal year 1983. Revenues fell $122.5 million from the level in fiscal year 1982.

*Chart B4*

Indexes of Oil and Natural Gas Production in Texas
1973–1983

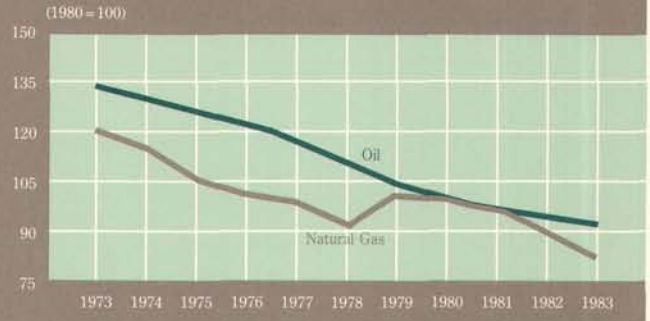
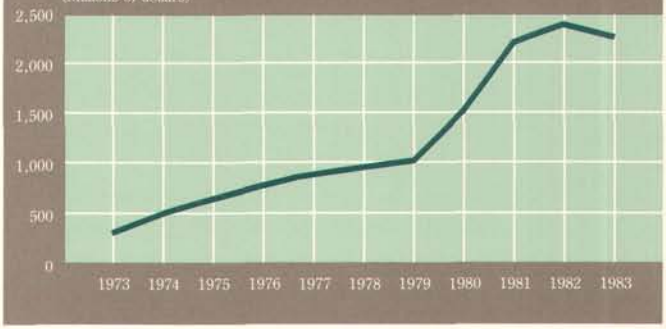



*Chart B5*

Texas Oil and Gas Revenue
1973–1983


*Chart B6*

Texas Oil and Gas Severance Tax Collections



### Increasing competition in services

Even with falling oil and natural gas production, the demand for oil field services should remain strong for some time. As reserves are depleted, drilling actually may rise as producers begin to develop smaller fields and use enhanced recovery techniques in old fields to extract the remaining oil. Furthermore, oil field equipment manufacturing services and oil field engineering services have developed in Texas and remain the dominant source of equipment and technology for the world. Consequently, the decline of Texas as a major producer of oil and gas may not affect the larger world market for oil field equipment and services.

Competition from other countries in the oil field services and equipment industries is likely to get stronger. Investment in these industries by foreign producers in an effort to develop their own industrial infrastructures has increased the competition faced by Texas firms. The current advantage held by Texas industries may decline as the importance of the state's own production falls.

### Facing strong competition in refining and petrochemicals

The strongest competition for the Texas energy industries is emerging in the petrochemical and refining markets. OPEC countries—Saudi Arabia and Kuwait in particular—have undertaken major investment projects to develop petrochemical and refined product industries. These countries are actively attempting to diversify and build a broader capital base and are likely to price their outputs competitively. As a result, the volume of foreign refined products may well rise.

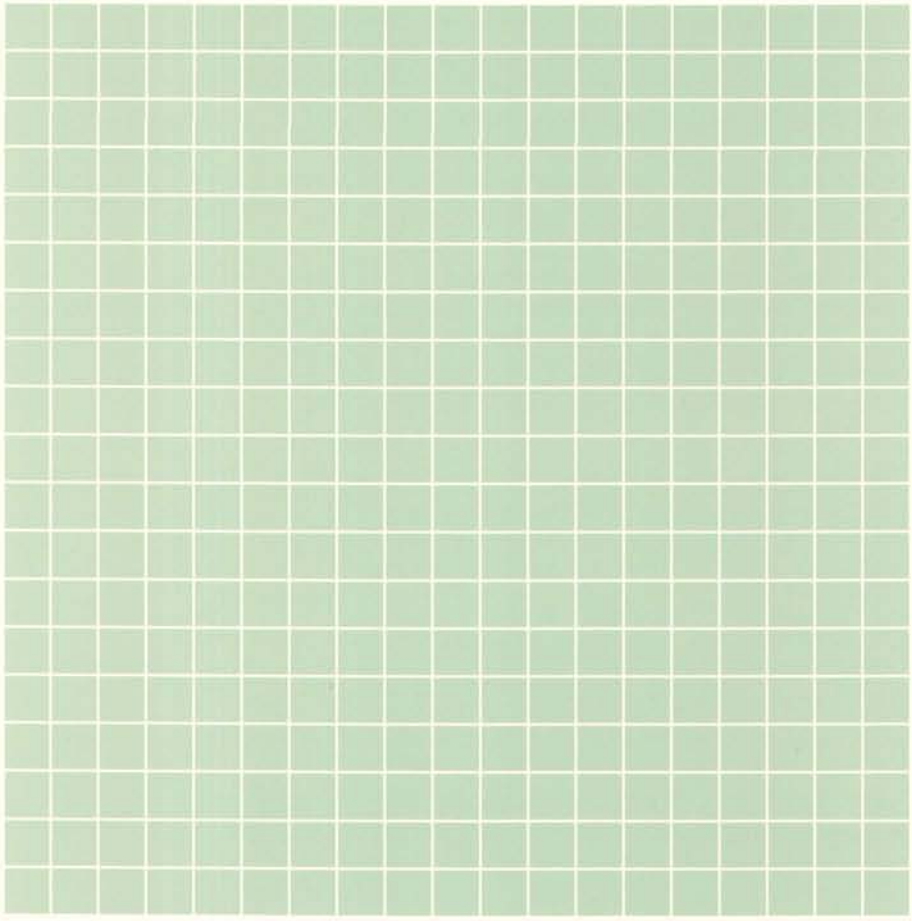
Gulf Coast refineries should continue to have an advantage over other domestic refineries because of their proximity to the oil they process and their greater capability in handling the heavier, lower-quality crudes that are now making up a large proportion of supply—especially the new production from off the coast of California and from Mexico and Venezuela. These locational and technological advantages may diminish over time with the decline in Texas production and changes in the composition of the world oil supply.

### Declining prominence

The slow growth or decline in the energy industry probably will decrease the prominence of energy in Texas but does not signal the end of economic growth. Even with a major recession in the energy sector in 1982 and 1983, unemployment in Texas was well below the national average. With the expansion of defense spending and the spread of computer applications, the electronics and defense industries are likely to grow rapidly. Although competing with many other states, Texas has been relatively successful in attracting high-technology firms. Furthermore, with the comparatively favorable business climate in Texas—lower labor costs and no corporate or personal income taxes—business should continue to migrate to Texas.

The expected change in the industrial composition of the state will have considerable effects on the economy. One issue that currently is becoming important is the decline of energy severance taxes as a major source of state revenues (*Box 3*). Although still a major source, the revenues have been falling recently and likely will continue to fall unless tax rates are changed. The decline in this source of revenue will require increases in other taxes or decreases in the rate of growth in state services and expenditures.

Therefore, what can be expected in the future is a less prominent energy sector. Although the energy industry will continue to contribute heavily to income and the value added in Texas, growth of the state's economy relative to the nation's will depend increasingly on the degree to which Texas is able to attract and develop nonenergy industries.



The past year was an active one for the Federal Reserve Bank of Dallas and its branches in El Paso, Houston and San Antonio. Throughout 1984 several new services were introduced and traditional services were expanded to answer the increasing needs of financial institutions as well as the needs of the Federal Reserve System. These services ranged from new methods of calculating reserve requirements to new methods of accessing services through direct computer connections to the Dallas Fed. Interest rates on Treasury bills dropped slightly and the Federal Reserve's discount rate rose once, then decreased twice to end the year at 8 percent. The prime rate started the year off at 11 percent, reached its 1984 peak of 13 percent in April and started falling again in September to finish the year at 10.75 percent. With interest rates falling and inflation held to approximately 4 percent, the economic recovery continued its effects on this District and the nation.

## CONTEMPORANEOUS RESERVE REQUIREMENTS

The year started off with the Federal Reserve System announcing the establishment of contemporaneous reserve requirements beginning February 2. This system, which affects approximately 1,200 financial institutions in this District, is designed to give tighter control over the nation's money supply. It is based on holding reserves two days following a two-week computation period rather than the previous one-week delay in holding reserves following a one-week computation period. The Federal Reserve Bank of Dallas held seminars around the District to teach financial institutions how to prepare for the changes. The Bank also established an ongoing service that answers questions on a "what if" basis. Financial institutions can phone in their data for a particular reporting period and estimates of their reserve requirement can be calculated. In this way, the Dallas Fed helps institutions maintain their ongoing requirements.

## FINANCIAL SERVICES

**Electronic Services**

Two new automated clearinghouse (ACH) services—a presorted deposit option and telephone advice for night cycle transactions—were introduced in 1984. Under the presorted deposit option, ACH originators are assessed lower fees or are able to deposit transactions later if they sort transactions according to the receiving Federal Reserve office. The telephone advice service is provided to those institutions whose ACH night cycle transactions cannot be delivered by ground transportation in time for settlement. Fees were lowered for basic wire transfer services, and the Board of Governors established a fixed monthly fee for institutions having electronic connections with the Federal Reserve for priced services.

**Cash Services**

A new method for placing cash orders also was implemented during 1984. Called the ORDERECORDER, the system allows institutions to order currency and coin using a touchtone telephone. The new system offers earlier credit information as well as convenience for financial institutions ordering cash from the Dallas Fed.

**Checks Services**

On April 23, the Dallas Fed implemented a new premium check collection service. The service was the second phase of a major plan by the Federal Reserve System to improve the efficiency of the nation's payments system and to speed up the collection of checks. The program, known as the high dollar group sort, allows immediate credit for certain non-city items, and return items are processed more quickly due to faster presentment. In addition, the service also provides significant improvements in deposit deadlines and is designed especially for the collection of

high dollar items. The program allows financial institutions to increase their earnings associated with improved availability and lower net collection costs.

In other areas of check processing, the Dallas Fed opened a regional check processing center (RCPC) to serve the El Paso territory of this District. The new RCPC substantially improves check processing services by increasing the availability of funds for financial institutions and allowing overnight delivery of reserve account statements and ACH data that are generated by the El Paso Branch. Later in 1984, the Dallas Fed also announced the expansion of the Dallas RCPC to include the territory of northern Louisiana. The Dallas Fed operates four regional clearing centers as part of its continuing efforts to accelerate the collection of checks.

**RESPONSE Network**

The Federal Reserve Bank of Dallas introduced the RESPONSE network in 1982. RESPONSE is the communications network that links institutions with the Dallas Fed computer and the nationwide Federal Reserve communications system. Since 1982, many service options have been made available to financial institutions over the network. During 1984, financial institutions were able to electronically transmit deposit data to the Fed through either dedicated terminals or personal computer connections. On-line institutions can now report data directly to the Fed—a process which speeds up the calculation of reserve requirements. The Dallas Fed also announced new options concerning additional computer links to the system for those already on-line, the availability of new computer equipment to access the system and memory upgrades on older equipment already on-line with the system. Financial institutions were also allowed to access the network through their own computer system if it was compatible with the RESPONSE network. In addition, two new on-line advice retrieval services were made available in 1984—Treasury tax and loan transactions and mixed cash letter credit availability.

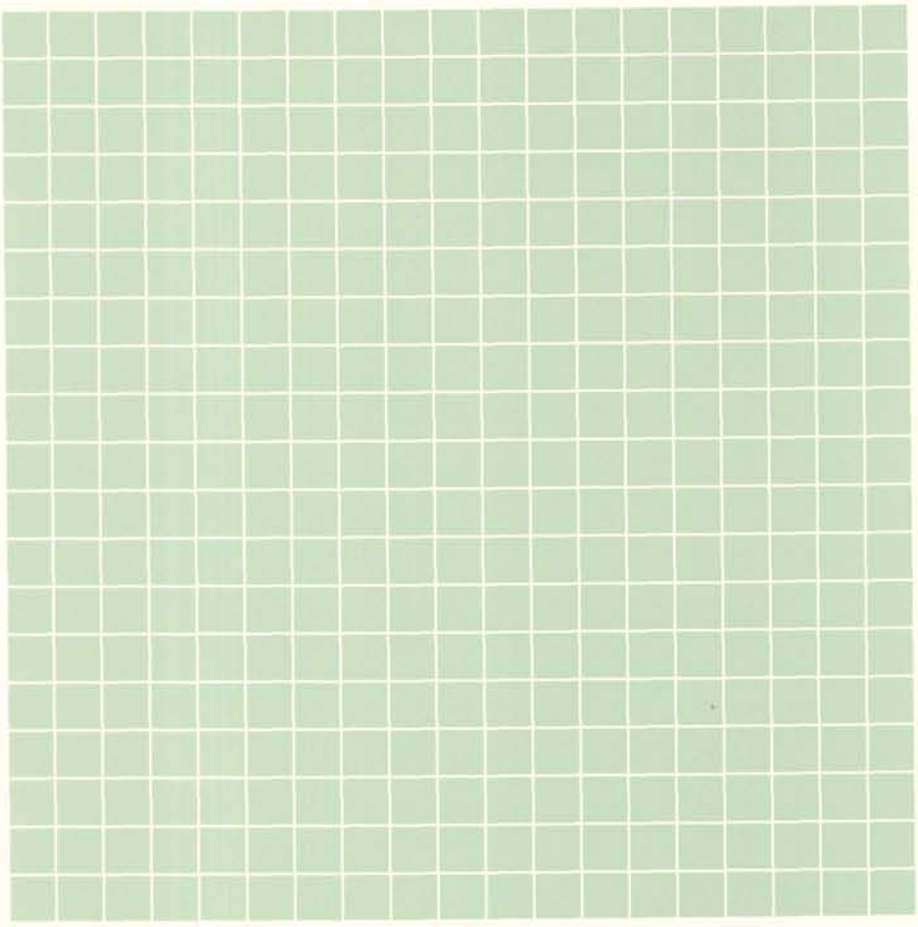
Financial institutions can be linked to the RESPONSE network in three ways. They may be directly connected to the Dallas Fed's computer by a computer-to-computer link, by dedicated computer terminals or by a dial-up arrangement utilizing personal computers. If an institution decides to be connected by personal computer, various options are available including two models of personal computers which can be leased from the Dallas Fed. Or, financial institutions owning their own computer equipment can connect directly, as long as their systems are compatible with the requirements of the RESPONSE network. By yearend, there were 747 financial institutions connected with the network, and 558 of these were connected by a personal computer.

## Bank Holding Company Activity

Bank holding companies experienced a year in which they were allowed to offer new financial services to their customers. Early in the year, five new activities were added to the list of nonbanking activities in which bank holding companies may engage. These were issuing money orders, arranging commercial real estate equity financing, underwriting and dealing in government and certain money market obligations, providing foreign exchange advisory and transactional services and acting as futures commission merchants. Nonbank applications were spurred by a Federal Reserve Board of Governors' decision approving the application of U.S. Trust Corp. of New York to convert its Florida subsidiary from a nondepository trust company to an institution that accepts demand deposits and makes consumer loans.

Holding company activity in this District continued its growth, and 1,258 banking institutions were affiliated with 701 one-bank or multibank holding companies by

yearend. These holding companies also had 425 nonbank subsidiaries. Holding companies accounted for 85.28 percent of domestic deposits in the District—18.52 percent for one-bank holding companies and 66.76 percent for multibank holding companies. Together, financial institutions affiliated with holding companies held over $121 billion of domestic deposits in subsidiary banks.



# DALLAS

Robert D. Rogers
Chairman and Federal Reserve Agent
*President and Chief Executive Officer*
*Texas Industries Inc.*
*Dallas, Texas*

Kent Gilbreath
*Associate Dean*
*Hankamer School of Business*
*Baylor University*
*Waco, Texas*

John V. James
Deputy Chairman
*Chairman of the Executive Committee*
*Dresser Industries Inc.*
*Dallas, Texas*

John P. Gilliam
*Chairman of the Board and Chief Executive Officer*
*First National Bank in Valley Mills*
*Valley Mills, Texas*

J. Wayland Bennett
*Charles C. Thompson Professor of Agricultural Finance and Associate Dean, College of Agricultural Sciences*
*Texas Tech University*
*Lubbock, Texas*

Bobby R. Inman
*Chairman, President and Chief Executive Officer*
*Microelectronics and Computer Technology Corporation*
*Austin, Texas*

Lewis H. Bond
*Chairman of the Board and Chief Executive Officer*
*Texas American Bancshares Inc.*
*Fort Worth, Texas*

Miles D. Wilson
*Chairman of the Board and Chief Executive Officer*
*The First National Bank of Bellville*
*Bellville, Texas*

Robert Ted Enloe, III
*President*
*Lomas & Nettleton Financial Corporation*
*Dallas, Texas*

FEDERAL ADVISORY COUNCIL MEMBER

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*First City Bancorporation of Texas Inc.*
*Houston, Texas*

Mary Carmen Saucedo
Chairman
*Associate Superintendent*
*Central Area Office, El Paso*
*Independent School District*
*El Paso, Texas*

Gerald W. Thomas
*President*
*New Mexico State University*
*Las Cruces, New Mexico*

John R. Sibley
Chairman Pro Tem
*President*
*Delaware Mountain Enterprises*
*Carlsbad, New Mexico*

Peyton Yates
*President*
*Yates Drilling Company*
*Artesia, New Mexico*

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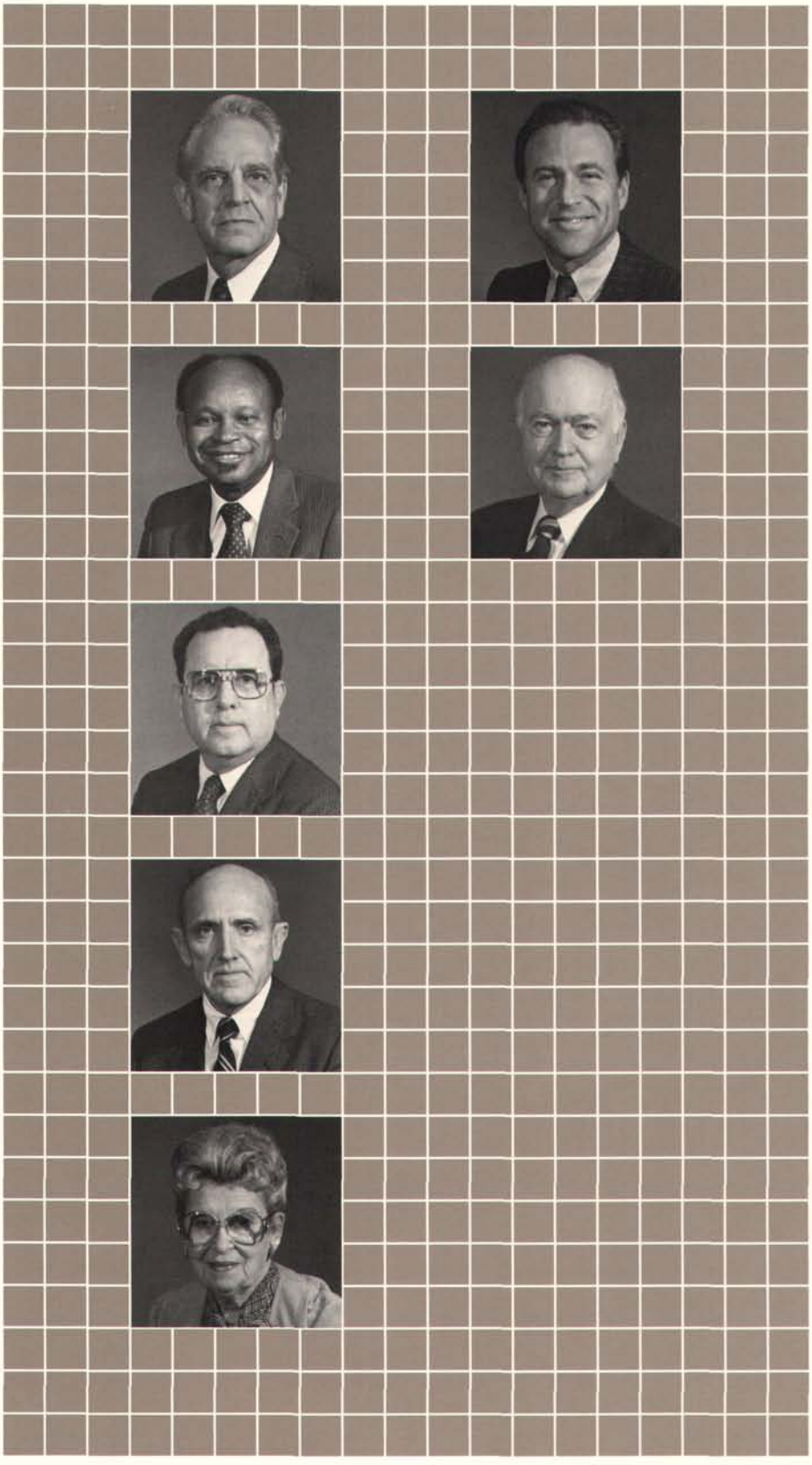
*Chairman of the Board and*
*Chief Executive Officer*
*InterFirst Bank El Paso, N.A.*
*El Paso, Texas*

Ernest M. Schur
*Chairman of the*
*Executive Committee*
*InterFirst Bank Odessa, N.A.*
*Odessa, Texas*

David L. Stone
*President*
*The Portales National Bank*
*Portales, New Mexico*

# HOUSTON



Paul N. Howell
Chairman
*Chairman of the Board and*
*Chief Executive Officer*
*Howell Corporation*
*Houston, Texas*

Robert T. Sakowitz
*Chairman of the Board*
*and President*
*Sakowitz Inc.*
*Houston, Texas*

George V. Smith, Sr.
Chairman Pro Tem
*President*
*Smith Pipe Companies Inc.*
*Houston, Texas*

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*Chairman of the*
*Executive Committee*
*First City Bank of Beaumont*
*Beaumont, Texas*

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*Chairman of the Board and*
*Chief Executive Officer*
*First Freeport National Bank*
*Freeport, Texas*

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*Vice Chairman*
*Texas Commerce Bancshares Inc.*
*Houston, Texas*

Marcella D. Perry
*President and*
*Chief Executive Officer*
*Heights Savings Association*
*Houston, Texas*

Lawrence L. Crum
Chairman
*Professor of Banking and Finance*
*The University of Texas at Austin*
*Austin, Texas*

C. Ivan Wilson
*Chairman of the Board and Chief Executive Officer*
*First City Bank of Corpus Christi*
*Corpus Christi, Texas*

Robert F. McDermott
Chairman Pro Tem
*Chairman of the Board and President*
*United Services Automobile Association*
*San Antonio, Texas*

Carlos A. Zuniga
*Laredo Freight Services Inc.*
*Laredo, Texas*

Joe D. Barbee
*President and Chief Executive Officer*
*Barbee-Neuhaus Implement Company*
*Weslaco, Texas*

George Brannies
*Chairman of the Board and President*
*The Mason National Bank*
*Mason, Texas*

Charles E. Cheever, Jr.
*Chairman of the Board*
*Broadway National Bank*
*San Antonio, Texas*

# OFFICERS

## HEAD OFFICE

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*President*

William H. Wallace
*First Vice President*

Joseph E. Burns
*Senior Vice President*

George C. Cochran, III
*Senior Vice President*

Jay K. Mast
*Senior Vice President*

Harry E. Robinson, Jr.
*Senior Vice President*

Neil B. Ryan
*Senior Vice President*

Tony J. Salvaggio
*Senior Vice President*

Jack A. Clymer
*Vice President*

Billy J. Dusek
*Vice President*

Robert F. Langlinais
*Vice President and General Auditor*

Anthony J. Montelaro
*Vice President*

James E. Pearce
*Vice President and Associate Director*

Larry J. Reck
*Vice President*

Robert Smith, III
*Vice President and Secretary*

Larry M. Snell
*Vice President*

James L. Stull
*Vice President*

Millard E. Sweatt, Jr.
*Vice President and General Counsel*

E. W. Vorlop, Jr.
*Vice President*

Carla M. Warberg
*Vice President*

Uzziah Anderson
*Assistant Vice President*

Basil J. Asaro
*Assistant Vice President*

Richard L. Barnes
*Assistant Vice President*

T. Guy Brown
*Assistant Vice President*

Terry B. Campbell
*Assistant Vice President*

Lyne H. Carter
*Assistant Vice President*

Billy D. Fuller
*Assistant Vice President*

Robert D. Hankins
*Assistant Vice President*

Andrew W. Hogwood, Jr.
*Assistant Vice President*

Helen E. Holcomb
*Assistant Vice President*

Richard D. Ingram
*Assistant Vice President*

Johnny L. Johnson
*Assistant Vice President*

Leroy O. Laney
*Assistant Vice President and Senior Economist*

Rebecca W. Meinzer
*Assistant Vice President*

Billy B. Musgrave
*Assistant Vice President*

Dean A. Pankonien
*Assistant General Counsel*

John R. Phillips
*Assistant Vice President*

William M. Rettie
*Assistant Vice President*

Larry C. Ripley
*Assistant Vice President*

Mary M. Rosas
*Assistant Vice President*

Robert J. Rossato
*Assistant Vice President*

Thomas H. Rust
*Assistant Vice President*

Jesse D. Sanders
*Assistant Vice President*

Eugenie D. Short
*Assistant Vice President and Senior Economist*

W. Arthur Tribble
*Assistant Vice President and Assistant Secretary*

C. Lynn Vick
*Assistant Vice President*

Stephen M. Welch
*Assistant Vice President*

Robert L. Whitman
*Assistant Vice President*

## EL PASO BRANCH

Joel L. Koonce, Jr.
*Vice President in Charge*

Robert W. Schultz
*Assistant Vice President*

## HOUSTON BRANCH

J. Z. Rowe
*Senior Vice President in Charge*

Vernon L. Bartee
*Assistant Vice President*

Sammie C. Clay
*Assistant Vice President*

Luther E. Richards
*Assistant Vice President*

## SAN ANTONIO BRANCH

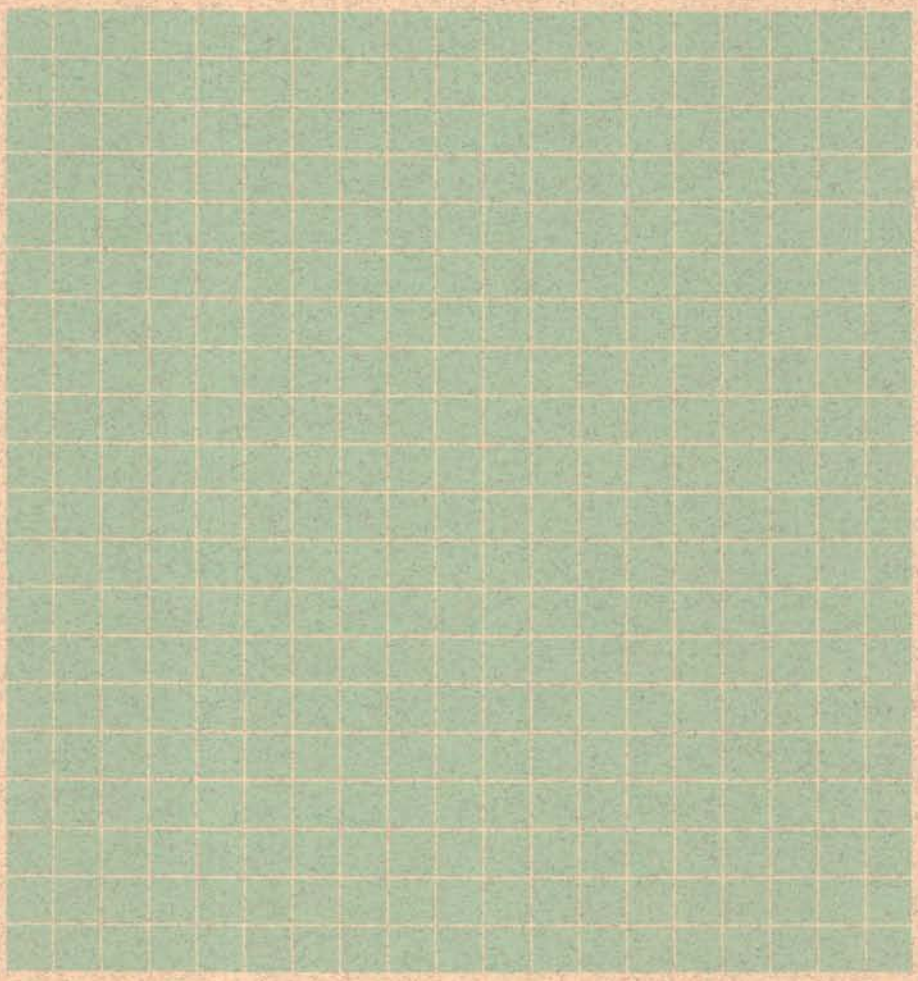
Thomas H. Robertson
*Vice President in Charge*

John A. Bullock
*Assistant Vice President*

Thomas C. Cole
*Assistant Vice President*

Antonio G. Valencia, Jr.
*Assistant Vice President*

January 1, 1985



# STATEMENT OF CONDITION

| | December 31, 1984 | December 31, 1983 |
|---|---|---|
| | (thousands)* | |
| **ASSETS** | | |
| Gold certificate account[1] | $ 726,000 | $ 750,000 |
| Special Drawing Rights certificate account[2] | 310,000 | 310,000 |
| Coin | 33,894 | 28,176 |
| Loans to depository institutions | 22,900 | 69,600 |
| Securities: | | |
| Federal agency obligations | 531,441 | 598,175 |
| U.S. government securities | 10,086,354 | 10,417,528 |
| Total securities | $10,617,795 | $11,015,703 |
| Cash items in process of collection | 814,410 | 1,101,371 |
| Bank premises (net) | 18,571 | 18,198 |
| Other assets | 1,043,736 | 1,185,882 |
| Interdistrict settlement account | 719,682 | (1,247,025) |
| TOTAL ASSETS | $14,306,987 | $13,231,905 |
| **LIABILITIES** | | |
| Federal Reserve notes | $10,807,478 | $ 9,943,735 |
| Deposits: | | |
| Depository institutions | 2,480,242 | 1,984,968 |
| Foreign | 11,100 | 10,350 |
| Other | 34,141 | 29,898 |
| Total deposits | $ 2,525,483 | $ 2,025,216 |
| Deferred availability cash items | 551,129 | 884,466 |
| Other liabilities | 164,304 | 163,189 |
| TOTAL LIABILITIES | $14,048,395 | $13,016,606 |
| **CAPITAL ACCOUNTS** | | |
| Capital paid in | $ 129,296 | $ 107,650 |
| Surplus | 129,296 | 107,650 |
| TOTAL CAPITAL ACCOUNTS | $ 258,592 | $ 215,299 |
| TOTAL LIABILITIES AND CAPITAL ACCOUNTS | $14,306,987 | $13,231,905 |

*Detail figures may not balance to totals due to rounding.

[1]This Bank's share of gold certificates deposited by the U.S. Treasury with the Federal Reserve System.

[2]This Bank's share of Special Drawing Rights Certificates deposited by the U.S. Treasury with the Federal Reserve Bank of New York.

# INCOME AND EXPENSES

| For the year ended December 31 | 1984 | 1983 |
|---|---|---|
| | (thousands)* | |
| **CURRENT INCOME** | | |
| Interest on loans | $ 72,422 | $ 50,351 |
| Interest on government securities | 1,081,773 | 1,036,724 |
| Income on foreign currency | 16,017 | 18,892 |
| Income from priced services | 40,471 | 35,140 |
| All other income | 914 | 624 |
| Total current income | $1,211,598 | $1,141,731 |
| **CURRENT EXPENSES** | | |
| Current operating expenses | $ 65,246 | $ 62,676 |
| Less expenses reimbursed | (4,491) | (3,699) |
| Current net operating expenses | $ 60,755 | $ 58,977 |
| Cost of earnings credits | 4,027 | 2,579 |
| Current net expenses | $ 64,782 | $ 61,556 |
| CURRENT NET INCOME | $1,146,815 | $1,080,175 |
| **PROFIT AND LOSS** | | |
| Additions to current net income: | | |
| Profit on sales of government securities (net) | $ 3,211 | $ 1,433 |
| All other additions | — | 11 |
| Total additions | $ 3,211 | $ 1,444 |
| Deductions from current net income: | | |
| Loss on foreign exchange transactions (net) | $ 33,656 | $ 31,485 |
| All other deductions | 889 | 137 |
| Total deductions | $ 34,546 | $ 31,621 |
| Net additions or deductions | (31,335) | (30,178) |
| Assessment by Board of Governors: | | |
| Expenditures | $ 6,103 | $ 5,024 |
| Federal Reserve currency costs | 10,287 | 11,827 |
| NET INCOME AVAILABLE FOR DISTRIBUTION | $1,099,091 | $1,033,146 |
| **DISTRIBUTION OF NET INCOME** | | |
| Dividends paid | $ 7,132 | $ 6,161 |
| Payments to the U.S. Treasury (interest on F.R. notes) | 1,070,312 | 1,013,593 |
| Transferred to surplus | 21,647 | 13,392 |
| Surplus, January 1 | 107,650 | 94,258 |
| Surplus, December 31 | $ 129,296 | $ 107,650 |

*Detail figures may not balance to totals due to rounding.

# VOLUME OF OPERATIONS

## HEAD OFFICE AND BRANCHES COMBINED

| | Number of Pieces Handled | | Dollar Amount (thousands) | |
|---|---|---|---|---|
| | 1984 | 1983 | 1984 | 1983 |
| Currency received and counted | 724,028,800 | 637,770,000 | 9,032,996 | 8,055,781 |
| Coin received and counted | 1,434,951,000 | 1,250,069,576 | 3,023,819 | 226,669 |
| Food stamps redeemed | 189,316,312 | 193,873,652 | 779,028 | 796,289 |
| Transfers of funds | 5,670,374 | 4,833,717 | 7,704,094,000 | 6,524,627,000 |
| Checks handled: | | | | |
| U.S. government checks | 36,869,773 | 39,088,000 | 41,287,843 | 39,873,095 |
| Fine sort | 149,977,916 | 100,157,362 | 51,663,706 | 41,358,385 |
| All other[1] | 982,228,872 | 909,581,341 | 586,137,273 | 593,353,399 |
| ACH items handled: | | | | |
| Commercial | 20,104,939 | 14,023,590 | 49,978,833 | 71,341,597 |
| U.S. government | 18,270,673 | 18,183,267 | 9,908,540 | 9,464,762 |
| Collection items handled: | | | | |
| U.S. government coupons paid | 85,097 | 94,365 | 41,952 | 56,670 |
| All other | 248,367 | 131,633 | 703,211 | 424,352 |
| Issues, redemptions and exchanges of U.S. government securities: | | | | |
| Definitive and book-entry | 7,127,230 | 7,461,702 | 440,362,783 | 326,897,074 |
| Loans | 926 | 978 | 5,374,699 | 76,867,301 |

[1]Exclusive of checks drawn on the Federal Reserve Banks.

# BANK HOLDING COMPANY ACTIVITY

## NUMBER OF BANK HOLDING COMPANIES, BANK AND NONBANK SUBSIDIARIES

| | December 31, 1984 | December 31, 1983 |
|---|---|---|
| COMPANIES | | |
| One-bank holding companies | 559 | 502 |
| Multibank holding companies | 142 | 105 |
| Total bank holding companies | 701 | 607 |
| SUBSIDIARY BANKS | | |
| One-bank holding companies | 518* | 470 |
| Multibank holding companies | 750 | 693 |
| Total subsidiary banks | 1,268 | 1,163 |

*These figures are adjusted to reflect ownership of 41 subsidiary banks through intermediate shell holding companies also known as "second tier" bank holding companies.

| | | |
|---|---|---|
| NONBANK SUBSIDIARIES* | | |
| One-bank holding companies | 75 | 63 |
| Multibank holding companies | 350 | 340 |
| Total nonbank subsidiaries | 425 | 403 |

*Reflects only nonbank subsidiaries formed under Section 4(c)(8) of the Bank Holding Company Act.

## DEPOSIT DATA FOR SUBSIDIARY BANKS OF BANK HOLDING COMPANIES

| | December 31, 1984 | December 31, 1983 |
|---|---|---|
| DOMESTIC DEPOSITS IN SUBSIDIARY BANKS (millions) | | |
| One-bank holding companies | $ 26,490 | $ 20,981 |
| Multibank holding companies | 95,486 | 89,053 |
| Total | $121,976 | $110,034 |
| SUBSIDIARY BANKS, PERCENT OF DISTRICT DOMESTIC DEPOSITS | | |
| One-bank holding companies | 18.52 | 16.1 |
| Multibank holding companies | 66.76 | 68.4 |
| Total | 85.28 | 84.5 |