

# Houston Business

A Perspective on the Houston Economy

## Economic Continuity and Change: How Houston Returned from the Oil Bust

*Houston's recovery  
from 1987 to  
1991 can be  
explained under  
four headings:  
strong national  
economic growth,  
emergence of  
new industry,  
re-emergence of  
industry driven  
by cheap oil,  
and the  
consolidation  
of energy  
headquarters.*

### RECESSION AND RECOVERY: WHERE HOUSTON HAS BEEN

**T**he recession that struck Houston in the 1980s was long and extremely deep. Seasonally adjusted wage and salary data indicate that Houston's economy peaked in March 1982, then contracted for 61 months. During the downturn that lasted until April 1987, Houston lost 212,000 jobs, or a remarkable 13.4 percent of its wage and salary employment base. This slump was induced first by the fall in oil prices from the 1981 price spike by the Organization of Petroleum Exporting Countries. The 1981 oil price drop was a modest decline in retrospect, but it brought a growing realization that oil prices were not destined to rise forever. The recession lengthened and deepened as oil prices continued to fall, with the domestic wellhead price of crude briefly slipping to less than \$10 per barrel in mid-1986.

The peak and trough for those Houston jobs engaged in oil and gas mining or oil field services (again seasonally adjusted) coincided with the path of total employment; by April 1987 the city had lost 46.4 percent of the 115,500 mining jobs existing in March 1982. Many more oil-related jobs were lost in metal, pipe and machinery manufacturing. Indeed, drilling rigs and pipe would rust in yards all over the city for the rest of the decade.

Then came recovery in the Houston economy. By May 1990, the number of jobs lost during the downturn had been restored, and by

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the end of 1991, another 44,900 jobs had been added to the previous 1982 peak. Growth of wage and salary jobs after the trough was very rapid, averaging 4.4 percent per year through December 1990, compared with a 2.1-percent annual rate for the United States over the same period.

## SOURCES OF RECOVERY

The source of Houston's *recession* was simply the bursting of an oil price bubble. The source of Houston's *recovery* is more difficult to pinpoint. Certainly, the city did not have the luxury of a quick and simple return to the prior peak. The recovery phase of the business cycle, measured from trough to prior peak, should be the easiest and quickest growth phase, as workers are returned to factories and machinery idled by slack demand. Expansion to new peaks is slower, delayed by capital construction.

In Houston's case, however, much of the old capital remained unemployed. The number of working rotary rigs in the United States declined from a December 1981 peak of 4,520 to levels as low as 686 in June 1986. The peak rig count during Houston's recovery phase occurred during the Persian Gulf war when it briefly moved above 1,100. By the end of 1991, only 6,800 new mining jobs had been added from the 1987 trough, accounting for only 2.6 percent of the 257,000 jobs added back. Houston had been forced to find new and innovative paths to recovery and expansion.

Houston's economic recovery and subsequent growth can be explained largely under four broad headings: the national business cycle; the emergence of medical and aerospace engineering as major growth centers; the re-emergence of several important industries driven by cheap oil, including refining, petrochemicals, and international construction; and the consolidation of oil headquarters at large metropolitan centers, particularly Houston, replacing roughnecks and machinists with executives and engineers.

*The National Business Cycle*—Historically, Houston's economy often has moved counter to the U.S. business cycle, seeming immune to national downturns. Does this mean that the U.S. economy does not count in Houston? Studies by this Bank indicate that Houston is affected by the U.S. economy the same as the rest of the state of Texas, *if other things are held constant*. However, these "other things," particularly the price

of oil, can quickly throw Houston off the track of the U.S. economy. This Bank's estimates indicate that the city responds considerably more to oil price changes than even the rest of Texas. Since World War II, every U.S. recession except one has been preceded by a dramatic oil price increase (OPEC, Texas Railroad Commission, refinery strikes, etc.), in effect giving Houston a strong boost before each downturn. Houston's apparent immunity from U.S. recessions rests more on an early inoculation by the oil markets than any inherent resistance to the national business cycle.

Houston's decline and recovery took place during this nation's longest peacetime expansion, and favorable economic conditions in the rest of the country certainly speeded the healing process. By early 1987, Houston's unemployment rate was 9 percent, while labor markets were tight outside the Southwestern states: Boston 3.3 percent; New York City 5.2 percent; Washington, D.C., 3.4 percent; Miami 5.8 percent; and San Francisco 3.7 percent. Ingredients for a turnaround were in place, as workers willing to migrate to other cities could find work; at the same time, Houston was an attractive location for expansion in a tight national labor market.

*Emergence of New Industry*—The most visible symbols of Houston's recovery and growing diversification are the Texas Medical Center and the aerospace complex that has grown up around NASA's Johnson Space Center in the Clear Lake area. Both represent a clean break from the traditional oil-based economy, but at the same time complement the growing engineering and applied technology theme that has become the hallmark of much of the city's workforce.

In 1942, trustees of the estate of Monroe D. Anderson purchased 134 acres next to Hermann Hospital for the construction of a state cancer hospital to be operated by the University of Texas. Today, 41 nonprofit, member institutions of the Texas Medical Center engage in patient care, health education and research on a 600-acre campus. Surveys conducted by the Medical Center indicate that between 1988 and 1990, full-time employment grew from 42,500 to 46,500; the number of students on the various campuses grew from 10,000 to 12,000; and research funding grew from \$229 million to \$479 million. Between 1986 and 1992, the medical center completed \$1.4 billion in construction during an



otherwise stifled period for office and commercial building in Houston.

The Johnson Space Center, created in 1961, assumes the leading role in manned space flight. It is responsible for the Space Shuttle and will oversee operations aboard the Space Station Freedom until it is permanently manned. JSC's 1990 budget was \$2.5 billion with 47.2 percent spent locally. During the 1982-87 downturn in Houston, local spending grew by 57 percent, then jumped another 50 percent from 1987 to 1990. The JSC workforce—NASA employees, prime contractors and support contract personnel—totaled 16,750 in 1990. Aerospace contractors attracted to the Houston area by JSC contracts include Grumman Corp., McDonnell Douglas Space Systems and Boeing Corp.

*Cheap Oil and the Re-emergence of Key Industries*—The collapse of exploration and oil field development, so-called "upstream" oil, opened the door for better times in the "downstream" operations of refining and petrochemicals. Downstream industries thrive when oil prices are low since oil and natural gas liquids are these industries' chief feedstock. By the late 1980s they were healthy and contributing solidly to Houston's recovery.

Refiners turn a barrel of oil into energy products such as gasoline, and about 22 percent of the nation's refinery capacity lies along the Gulf Coast between Lake Charles, La., and Corpus Christi, Texas. Many small, obsolete refineries closed in the early 1980s as oil price controls and direct allocation of feedstock ended. The

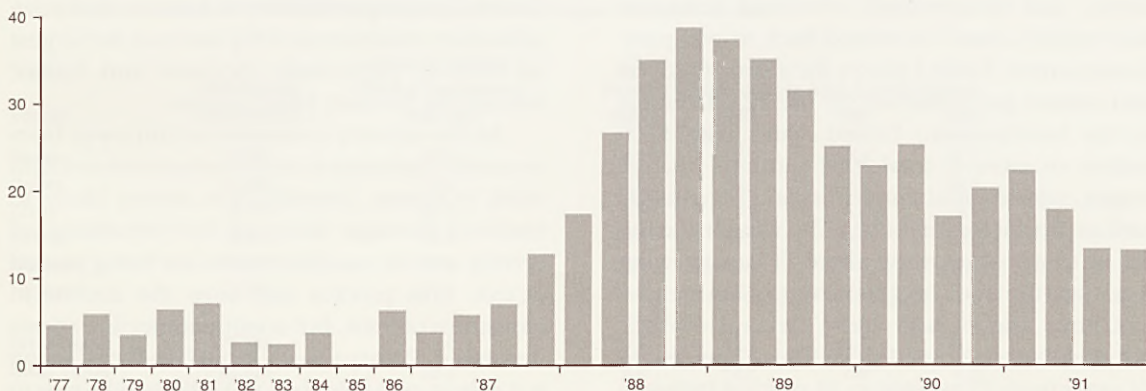
combination of diminished capacity and rising domestic fuel consumption after 1985 pushed utilization rates up sharply. The industry's margins on refined products, that is, the difference between product prices and feedstock costs, were at or above levels required for capital recovery almost continuously after 1986.

The most direct link between the refining industry and the Houston economy is employment, and this is a relationship that continues to weaken. This highly mechanized industry has contributed few new jobs since 1987. Probably the major contribution of refining to the Gulf Coast during the 1980s was an estimated capital expenditure of a billion dollars each year. Most of this money was spent to comply with the mandated phaseout of leaded gasolines, or to meet the rapidly increasing demand for higher octane gasolines.

Petrochemical plants turn a barrel of oil into a number of intermediate products that ultimately become plastics and synthetic rubber. Houston is home to roughly 45 percent of the nation's capacity for either basic petrochemicals or first-stage derivative products. Like refineries, petrochemicals are hurt by high energy prices, and the late 1970s and early 1980s saw the continued closing and rationalization of capacity. Figure 1 plots the margins for ethylene, one of the most important of the basic commodity petrochemicals. Margins, only 5 cents to 6 cents per pound through early 1987, soared over the next two years to levels near 40 cents per pound. Tight capacity, falling oil prices and strong economic

**Figure 1**  
**Gulf Coast Margins for Ethylene**

Cents per pound



SOURCE: *Oil and Gas Journal*.



expansion at home and abroad all contributed to the enormous profits that were made.

Again, the chief economic contribution was capital spending. Huge profits led to many new plant announcements, as well as extensive “debottlenecking” efforts to squeeze more product from existing capacity. According to one count of announced projects, construction spending of \$9 billion dollars was contemplated for the Texas Gulf Coast by early 1990, with half that slated for the Houston region. Not all these announcements came to fruition, of course, but many did and are under construction today.

This petrochemical boom affected Houston in another very important way. Extensive capital expansion in petrochemicals took place not only on the Gulf Coast but worldwide, and several of the engineering and construction firms most capable of carrying out this kind of work have headquarters in Houston; other companies without headquarters here, such as Fluor and Bechtel, maintain large engineering staffs in the city. Figure 2 shows the dollar value of new contracts signed between 1979 and 1990 by five Houston-based companies—Brown and Root, CRSS, Fish, M.W. Kellogg and Litwin. The decline in the mid-1980s reflects the drying up of petrodollars and the loss of large upstream projects such as gas processing plants. The sharp pullout of the 1987 trough generally reflects new business capital and infrastructure spending associated with rapid domestic and world growth, but the improvement reflects especially the boom in petrochemical redesign and expansion.

*Consolidation of Energy Headquarters*—As the oil and gas industry shrank, it began the process of centralizing its operations, generally into the largest Southwestern metropolitan oil centers. This process was inevitable as drilling rigs scattered throughout the nation were shut down, and decentralized overhead functions were either closed or moved back to company headquarters. Table 1 shows the share of U.S. oil and natural gas extraction by the 12 oil centers in the Southwestern United States with \$100 million or more in total 1988 earnings (that is, wages, salaries, and employer-paid benefits, as well as proprietors’ income). The winners on the list in terms of growing share, if not growing totals, are the three biggest metropolitan areas—Houston, Dallas and New Orleans—which boosted their combined share from 22 percent to 24 percent to 27 percent between 1982–83 and 1988–89. The nine smaller metro-

**Table 1**  
Earnings From Oil and Gas Extraction in the  
12 Largest Southwestern Oil Centers

Percent of U.S. Earnings

|                                | 1982        | 1983        | 1988        | 1989        |
|--------------------------------|-------------|-------------|-------------|-------------|
| Houston                        | 15.5        | 16.4        | 19.7        | 18.5        |
| Dallas                         | 3.9         | 4.3         | 5.8         | 5.3         |
| New Orleans                    | 2.9         | 3.0         | 3.8         | 3.5         |
| <b>Total, Big Three</b>        | <b>22.2</b> | <b>23.8</b> | <b>29.3</b> | <b>27.3</b> |
| <b>Total, Smaller Nine</b>     | <b>15.9</b> | <b>15.7</b> | <b>15.3</b> | <b>14.7</b> |
| <b>All Other United States</b> | <b>61.9</b> | <b>60.5</b> | <b>55.4</b> | <b>58.0</b> |

SOURCE: U.S. Department of Commerce, Bureau of Economic Analysis, *Local Area Personal Income 1984–89*.

politan areas lost a percentage point or so over this period, but the “all other United States” category was in fact the big loser.

The only real measure of industry “consolidation” is provided by *County Business Patterns*, which tracks administrative and auxiliary (A&A) employment for the mining sector. These A&A jobs are in headquarters, warehouses, research centers or other operations that provide centralized services to other establishments in the same company. Table 2 shows the share of oil jobs in A&A facilities in major Texas oil center counties from 1980 to 1989.

The biggest metropolitan areas were the biggest A&A centers before the oil bust, and this role grew rapidly and very significantly once the decline in the oil industry was under way. The consolidation process was shared, however, among all the metropolitan areas, although to a lesser degree outside Houston and Dallas. The “other Texas” category is the only loser in terms of aggregate share. Unfortunately, 1989 data are the latest available on industry consolidation, but many observers believe that consolidation continues in 1992 and that the largest oil centers, particularly Houston and Dallas, remain the primary beneficiaries.

As the industry continues to turn away from domestic exploration and development and shift work overseas, consolidation seems likely to continue because many of the remaining oil service and oil machinery jobs are being placed at risk. This process may slow the decline in Houston’s oil jobs, but continued decline seems inevitable. Perhaps the bottom line for Houston is a role in oil analogous to Hollywood’s role in the movie industry. In the 1950s, when new

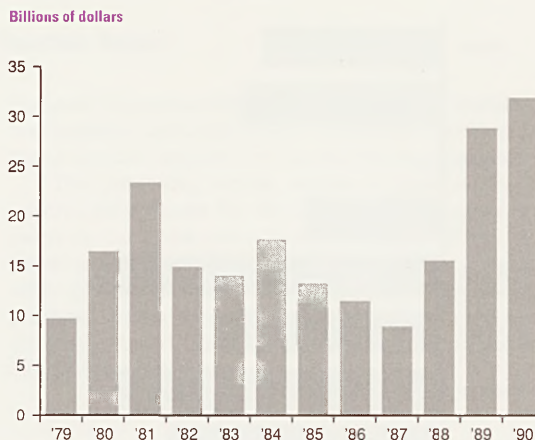
camera and sound technology allowed movies to leave the sound stages and be made on location around the world, the end of Hollywood was widely predicted. However, there still was a need for a place to house the movie industry's expertise in technology and production, and a place where elbows could be rubbed and deals struck. This place was Hollywood, of course, and Houston continues in a similar niche for the American oil industry.

### WHERE IS HOUSTON'S ECONOMY NOW?

It is easier, and very important, to first describe the kind of city Houston is *not*. It is not a major regional financial and distribution center on the order of Dallas or Atlanta. Throughout the Southeastern United States, no city between Florida and Texas rivals Atlanta. Retailers go to market in Atlanta; with a modest tip of the hat to Charlotte, Atlanta remains the regional financial center; the giant Hartsfield Airport symbolizes the city's role as a major transportation and distribution hub. Dallas fills a similar role for the Southwest. As energy lending declined, and as bank consolidation proceeded through the 1980s, Dallas has increasingly emerged as the regional banking and financial leader. The giant Dallas TradeMart underscores the city's role in retailing; the DFW airport fills the same role in the Southwest as Hartsfield in the Southeast.

Houston simply does not compete very effectively with the economic strengths carved out by Dallas. However, it is unlikely that two cities located only 240 miles apart would grow to the current size and stature of Houston and Dallas by

**Figure 2**  
New Construction Contracts  
of Houston-Based Firms, 1979-90



SOURCE: *Engineering News-Record*.

carrying out a similar economic function. So, what does Houston do? This article has covered many of the specifics already. Houston continues to grow as headquarters for the U.S. oil industry, with 1989 earnings from oil and gas of \$3.6 billion. Dallas is the number two city, with \$1.1 billion in earnings, followed by New Orleans (\$.72 billion) and Denver (\$.71 billion). In addition to exploration and production, there are the huge downstream chemical and refining operations in Houston. There are the international engineering and construction firms that operate from Houston, and the strong, recent growth at NASA and the Medical Center.

Is there a common thread here? If so, it would seem that Houston is a massive center for

**Table 2**  
Administrative and Auxiliary (A&A) Mining Employment in the Largest Texas Oil Centers

| County      | 1989 Mining Employment | Percent Decline Mining Employment 1982-89 | Percent Mining Jobs in A&A Establishments |      |      |      |
|-------------|------------------------|---|---|------|------|------|
|             |                        |   | 1980                                      | 1981 | 1988 | 1989 |
| Bexar       | 3,092                  | 34.9                                      | 6.3                                       | 7.3  | 47.9 | 42.2 |
| Dallas      | 17,460                 | 15.2                                      | 46.3                                      | 36.2 | 62.8 | 59.3 |
| Ector       | 2,723                  | 62.5                                      | 4.6                                       | 6.0  | 5.4  | 6.4  |
| Harris      | 56,068                 | 23.5                                      | 46.4                                      | 41.9 | 70.4 | 64.2 |
| Midland     | 7,527                  | 52.6                                      | 23.5                                      | 16.4 | 45.5 | 49.8 |
| Tarrant     | 2,989                  | 31.1                                      | 58.9                                      | 42.7 | 33.6 | 37.0 |
| Total Texas | 172,388                | 42.4                                      | 16.9                                      | 15.7 | 30.7 | 31.8 |
| Other Texas | 82,529                 | 52.3                                      | 4.2                                       | 2.7  | 2.6  | 2.6  |

SOURCES: U.S. Department of Commerce, Bureau of the Census, *County Business Patterns*, Texas, various years.



**Figure 3**  
**Service-Sector Jobs Added in Houston,**  
**December 1986 to December 1991**



SOURCE: Texas Employment Commission.

engineering and *applied* technology. This is not *high* technology, associated with the frontiers of science. Instead, it is the business of applying the best available science to geology, construction, chemicals, space exploration and medicine. If the businesses seem different on the surface, they all depend on strong and experienced administrative skills, as well as a large workforce in engineering, computer operations and other key technologies. Houston always offered oil and gas firms what economists call *economies of localization*—external economies that accrue to like businesses that agglomerate in one place. The ability to use these economies of localization to attract and build a much broader base in applied technology is at the heart of Houston's economic recovery and recent expansion.

The difference between this expansion and the boom of the early 1980s is illustrated by the pattern of job growth in Houston. In the early 1980s, mining, construction and manufacturing were the engine of growth. This time, however, the strongest growth came from the service sector (Figure 3). Trade and personal services, which react to rather than drive local conditions, added 45,000 jobs; finance, insurance and real estate (FIRE) slowly recovered but added few jobs; transportation, communications, and public utilities (TCPU) performed modestly well.

Most important, however, as Figure 3 reflects,

is the strong growth in business services, health services and legal and professional services. These three sectors contributed 105,000 jobs, or 41.4 percent of the total from 1986 to 1991. As the oil industry in Houston has become more professional, so have other sectors of its economy. The strong growth in business and professional services, particularly in accounting and engineering, reflects the broad administrative role the city has assumed in many areas of technology. Houston's economic downturn brought the loss of many well-paid blue collar jobs; the recovery has replaced them with many well-paid white collar jobs.

## CONCLUSION

A review of Houston's key businesses—oil and gas, international construction, petrochemicals, space technology, medical services—shows the city was on something of a roll in the late 1980s. All these businesses were working strongly to Houston's benefit. Recently, however, oil and gas prices soured once more. This time, there are strong overtones of "more than just another downturn" as many domestic operations are being abandoned. Natural gas pipelines face major operational changes under federally proposed deregulation. Chemical construction continues along the Gulf Coast, but the industry is moving rapidly toward a glut in many commodity chemicals.

Implementation of the Clean Air Act is just over the horizon, with Houston ranked as the second dirtiest city in America. The new law stands to impinge on lifestyles and on the operating cost of virtually every business. It will force a large number of decisions concerning the future of plants now operating along the ship channel, including refineries facing mandates for reformulated gasolines. The expense to upgrade the plants, however, is an opportunity for the engineering and construction firms that win the contracts.

What about the future of the space program in Houston? Given the spiraling cost of health care, can we afford spiraling growth at the Medical Center? Shouldn't a city like Houston, with its strong base in the application of technology to business, be a hotbed for new and small businesses? Has it been?

Expert discussion of all these issues is available at the Four Seasons Hotel on March 26 during the Texas Gulf Coast Economic Conference.

# Houston's Economic Evolution from Energy to Diversity

## The 1992 Texas Gulf Coast Economic Conference

March 26, 1992 — Houston, Texas

On March 26, the Houston Branch of the Federal Reserve Bank of Dallas will sponsor its second annual Texas Gulf Coast Economic Conference. The conference, titled *Houston's Economic Evolution from Energy to Diversity*, will focus on Houston—where the city's economy has been, where it is now and where it will go over the next 10 years. A list of subjects and speakers, as well as registration information, is presented below. Conference organizers asked speakers to put on their *speculative* thinking caps and predict how Houston will be affected by apparent declines in

domestic oil exploration, the deregulation of the pipeline industry, the Clean Air Act, free trade with Mexico, Space Station Freedom, medical technology and more.

The preceding article, written to provide background information for the conference, suggests answers to the questions posed previously: Where has Houston been, and where is it now? These answers, although easy compared with predicting where the city is going, remain speculative and somewhat controversial. They should, however, stimulate lively discussions during the conference.

### REGISTRATION 7:00 a.m. to 8:00 a.m.

#### WELCOME 8:00 a.m.

Robert Smith III  
Senior Vice President in Charge  
Houston Branch, Federal Reserve Bank of Dallas

#### KICKOFF ADDRESS

Edward W. Kelley Jr.  
Board of Governors of the Federal Reserve System

#### RENEWAL AND PROGRESS IN HOUSTON

Robert W. Gilmer  
Senior Economist and Policy Advisor  
Federal Reserve Bank of Dallas

#### WILL THE TRANSFORMATION OF GULF COAST OIL AND GAS CONTINUE?

##### Moderator

Michelle Michot Foss  
Center for Public Policy  
University of Houston

##### Panelists

John W. Sauer  
Chief Energy Economist, Conoco Inc.

Wiley D. Carmichael  
Partner, Arthur Andersen & Co.

Bruce N. Stram  
Vice President, Corporate Planning  
Enron Corp.

#### TEXAS AND FREE TRADE WITH MEXICO

Mont P. Hoyt  
Partner, Baker & Botts

#### LUNCHEON ADDRESS

Robert D. McTeer Jr.  
President and Chief Executive Officer  
Federal Reserve Bank of Dallas

### CLEAN AIR AS PROGRESS, PROBLEM AND OPPORTUNITY

##### Moderator

Jared E. Hazleton  
Director of Business and Economic Analysis  
Texas A&M University

##### Panelists

Beverly Ann Hartsock  
Executive Assistant, Texas Air Control Board

Antonio M. Szabo  
President, Bonner & Moore Management Science

### GROWTH WITHOUT PETROLEUM

##### Moderator

Peter Mieszkowski  
Cline Professor of Economics and Finance  
Rice University

##### Panelists

L. J. (Roy) Pezoldt  
President  
Clear Lake Area Economic Development Foundation

Richard E. Wainerdi  
President and Chief Executive Officer  
Texas Medical Center

Elizabeth Gatewood  
Director, Small Business Development Center  
University of Houston

### ADJOURNMENT 4:30 p.m.

**For more information or to register** call Katherine Smith at the Houston Branch of the Federal Reserve Bank of Dallas. She can be contacted at (713) 652-1539.



**N**onenergy components of the Houston economy are improving: retail sales are growing stronger, residential and nonresidential construction have increased, and there is general stability in manufacturing. The energy sector continues to deteriorate, however. The current collapse in drilling is bringing more headquarters consolidations to Houston, but they seem unlikely to provide much more than a modest brake on energy-related job losses.

### RETAIL AND AUTO SALES

Houston retailing continues on its erratic path of the past 18 months. Since closing out a lackluster year in 1991, local retailers now report strong increases compared with the same time last year. Although early 1991 was a weak reporting period, sales this year are up 8 to 10 percent. Aggressive sales and marketing explain some of the increase, but consumer sentiment also seems to have improved in recent weeks. Auto sales remain slow, even compared with weak results in early 1991; January was down very sharply, and February was about even with last year. Typically, January and February are the slowest months of the year in the auto business, and early spring sales in Houston will provide the first reliable indication of how 1992 might shape up for car and truck sales.

### UPSTREAM OIL

The Baker-Hughes active rig count hit 50-year lows in January. At 653, the number of working rigs slipped below the level of 1942, when drilling was curtailed by wartime steel rationing. The rig count has risen only slightly since January. Extraordinarily low natural gas prices account for much of the decline in the rig count, as the February futures contract on the New York Mercantile Exchange fell to near \$1 per thousand cubic feet. Some decline in the rig count may be attributed to new technology that greatly improves the success rate of wells drilled, but greater efficiency provides little relief to drilling contractors or oil field service companies. Foreign drilling, expected to offset weak domestic drilling, has been below expectations for early 1992. Analysts say unique circumstances in several key countries have delayed individual drilling programs.

### REFINING AND PETROCHEMICALS

Still depressed by a weak economy, demand for gasoline and other refined products has been flat in recent months and is well below pre-recession levels. Product prices have eroded faster than feedstock costs, and margins continue to deteriorate. Petrochemical producers similarly are operating on very thin margins, with slight improvement noted in recent weeks. Demand is reported stable and fairly strong, but industry over-capacity continues to place prices of commodity chemicals under great pressure. Even a solid national economic recovery would not provide short-term price relief because of the surplus production capacity now on-line or coming on-line soon.

### LUMBER AND PAPER

Wood and building products look promising, with anticipation of dry weather bringing strong orders. Stumpage costs have been pushed up by the wet winter weather. Corrugated box shipments are holding steady. Changes in the demand mix for paper products have hurt profit margins of some producers, but overall sales are steady or down only slightly.

### REAL ESTATE AND CONSTRUCTION

Nonresidential construction continues at a strong pace, led by public expenditures for schools, buildings, roads and bridges. Although some build-to-suit office space is under construction and more is planned, the office market remains soft. Office vacancy rates and rents are about even with last year but, unlike last year, as many as 14 blocks of space larger than 150,000 square feet are available now due to corporate restructuring.

January sales of new homes were up 57 percent over last year, and starts were up 44 percent. Lower interest rates and some resumption in corporate relocations reportedly boosted sales. Starts have lagged sales for more than a year, leaving a very low inventory of new, completed homes. The market for existing homes apparently was slowed last month by the possibility of tax breaks for first-time buyers, and a slowdown in sales particularly of entry-level housing held the used-home market even with January 1991. Apartment occupancy and rents softened early this year, partly in response to stronger housing sales.

For more information, call Bill Gilmer at (713) 652-1546.

For a copy of this publication, write to

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