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ENERGY HIGHLIGHTS

Federal Reserve Bank of Dallas July 1986

Lower Prices May Enhance Future Energy Independence

Lower oil prices stimulate consumption and deter production of the nation's oil reserves, with potentially adverse affects on domestic energy independence. One factor often ignored, however, is that lower prices prolong the life of the nation's oil reserves, making more oil available in the future. The relative effects of lower prices on consumption, production, and reserve development depend on expectations about future prices. Delaying production of domestic oil reserves now because of lower prices could nevertheless enhance the nation's future energy independence.

Prices Affect Reserves

Falling prices affect reserves of crude oil in two ways. First, lower prices reduce the incentive for energy firms to explore for new reserves of oil, as the sharp decline in the number of operating drilling rigs in 1986 shows. Other factors being equal, lower prices can be expected to lower proven crude oil reserves. Alternatively, lower prices affect the level of reserves that producers can extract profitably. Falling prices make fields with higher production costs unprofitable. Thus, the level of economically recoverable reserves also drops when oil prices fall, but the large majority of the reserves that become uneconomical to extract at lower prices remain available for production should prices rise later. Lower prices thus can delay extraction of oil that is more costly to produce until the time when it is more valuable—when the price of oil from other sources is higher.

Domestic Reserves Show Declining Pattern

The United States has experienced declining reserves relative to production levels for several decades. With the exception of the discovery of large fields on the Alaskan North Slope in the early 1970s, reserves in terms of years of production have fallen steadily since 1960 (see Chart 1). Even during the 1970s and early 1980s when rising prices induced increased exploration activity, the ratio of reserves to production declined. This decline occurred because most U.S. reserves were discovered relatively early in the country's energy-producing history. Since the mid-1900s, production in most years has more than offset new discoveries, thus leading to the fall in reserves. Other countries have increased their oil reserves while the United States on net has depleted them. The growth of non-U.S. oil reserves is shown in Chart 2.

At the current level of oil prices, other countries can produce oil from their reserves more economically than the United States can try to add to its own reserves. Policies such as an oil import tariff to encourage exploration would also promote production, with the likely effect of offsetting additions to U.S. reserves. Lower prices, despite their stimulus to consumption, may make the country more energy independent later by deferring extraction of available reserves.

—William T. Long III

Energy Investment Estimates May Overstate Current Economic Strength

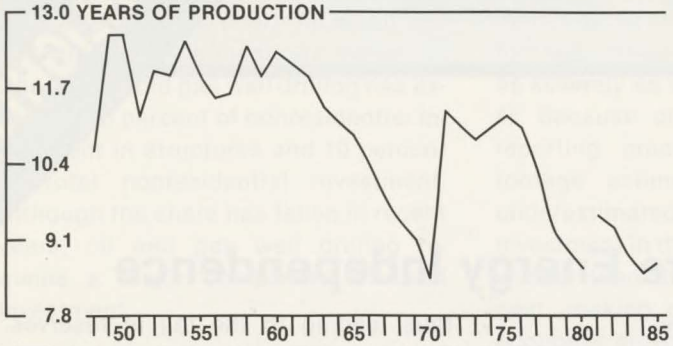
Falling oil prices can be expected eventually to cause more rapid economic growth in the United States. However, because the negative effects on the domestic energy sector occur before the positive effects on energy consumers can be realized, the expected growth surge is not likely to materialize in the near term. Although some of the negative effects of the slumping energy sector have been captured in the GNP accounts, estimation methods may have underestimated the decline in energy investment. Consequently, the current strength of the economy may have been overstated.

Oil Prices Affect Investment

Lower oil prices spur economic growth by reducing both the cost of a major production factor and the cost of petroleum products to consumers. Although some of the gains appear immediately as consumers need to spend less income on fuel, most of the gains take time—especially in investment. In the short term, energy-consuming industries do not invest immediately in new equipment to take advantage of lower oil prices, but energy-producing industries are pressed to reduce investment in exploration and development.

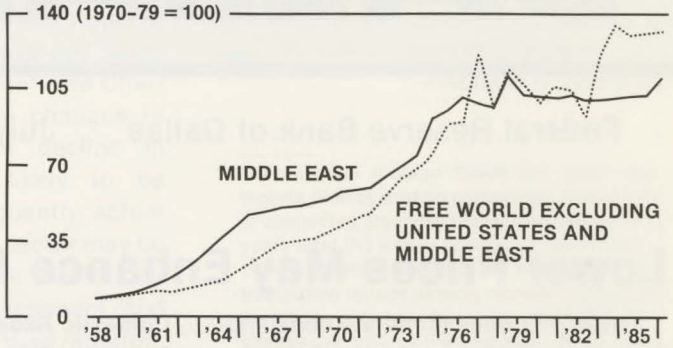
(Continued on back page)

Chart 1
U.S. RESERVE-PRODUCTION RATIO



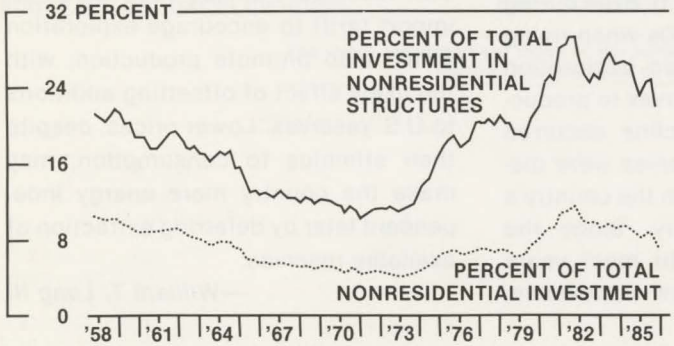
NOTE: After 1980, U.S. Department of Energy estimates were changed to a different base for computing reserves.
SOURCES: American Petroleum Institute, 1948-80.
U.S. Department of Energy, 1981-85.

Chart 2
MIDDLE EAST AND FREE WORLD RESERVES



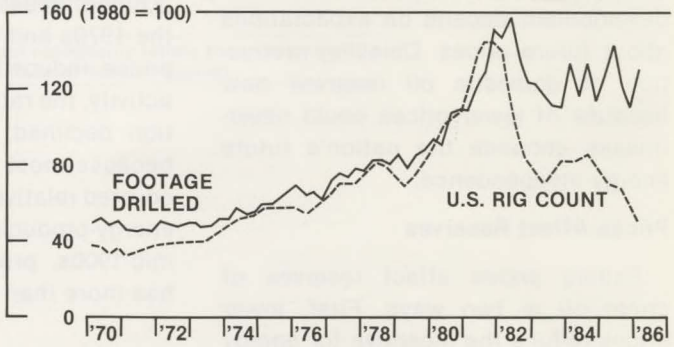
SOURCES: American Petroleum Institute.
Oil and Gas Journal.

Chart 3
INVESTMENT IN OIL AND GAS WELL DRILLING



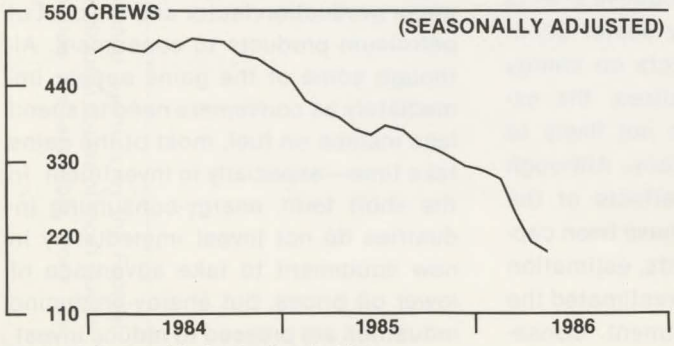
SOURCE: Board of Governors, Federal Reserve System.

Chart 4
FOOTAGE DRILLED AND THE U.S. RIG COUNT



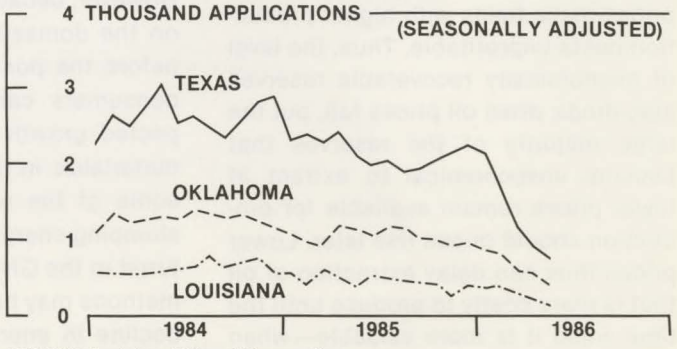
SOURCES: Board of Governors, Federal Reserve System.
Hughes Tool Company.

U.S. SEISMIC CREW COUNT



SOURCES: Society of Exploration Geophysicists.
Federal Reserve Bank of Dallas.

WELL PERMIT APPLICATIONS

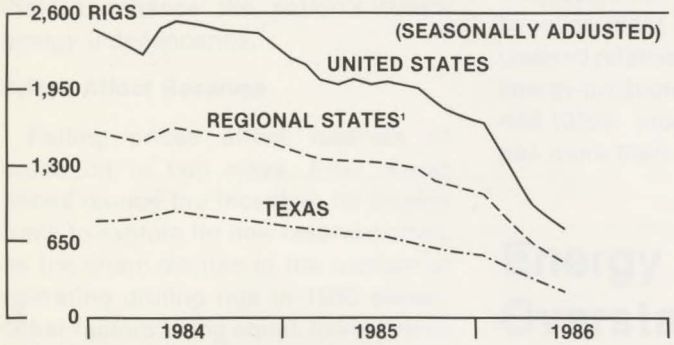


SOURCES: Louisiana Office of Conservation.
Oklahoma Corporation Commission.
Texas Railroad Commission.
Federal Reserve Bank of Dallas.

ENERGY BRIEFS

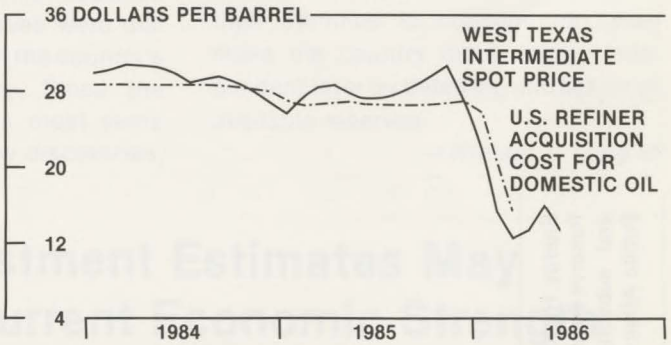
- Oil prices have firmed in recent months as a result of higher seasonal demand, but such demand has been weaker than expected. Although OPEC ministers agreed in June to an overall output quota, they failed to agree to country-by-country limits, thus dampening the prospects that prices will rise before the next seasonal demand increase this winter.
- Despite two weekly upturns in the rig count in June, the monthly average of this indicator continues to decline as a result of falling oil prices. Both the Texas and U.S. counts have fallen more than 60 percent below their year-earlier levels.
- A sustained recovery of drilling remains highly unlikely in the near future, as suggested by continued declines in leading indicators of drilling—seismic crew count and number of well permit applications. The number of seismic crews in May was only slightly more than half its year-earlier level, and declines in well permit applications also accelerated.
- Falling oil prices have caused severe dislocations in energy-related industries. Oil and gas extraction employment in May was almost 20 percent below its year-earlier level, showing a sharp 15-percent drop since December alone. During the same two periods, oil field machinery manufacturing lost 30 percent and 23 percent, respectively, of its workforce.
- Higher world oil production and lower crude oil prices, while leading to increased output by refiners, has not bolstered employment. Although capacity utilization at the nation's refiners, at 87 percent, is at its highest level in over two years, refining employment continues to trend down because more labor-intensive operations have been shut down.

ROTARY DRILLING RIGS RUNNING



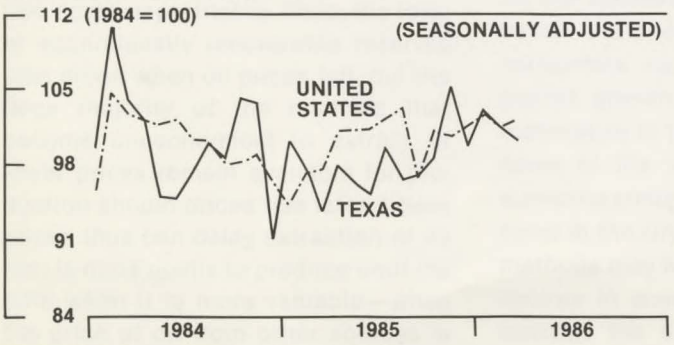
1. Louisiana, New Mexico, Oklahoma, and Texas.
SOURCES: Hughes Tool Company.
Federal Reserve Bank of Dallas.

SELECTED CRUDE OIL PRICES



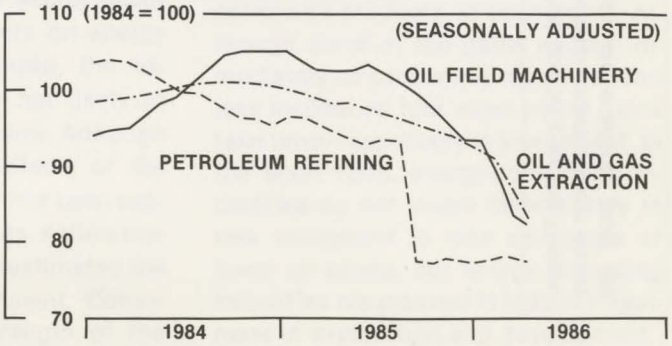
SOURCES: I. P. Sharp Associates.
U.S. Department of Energy.

REFINERY PRODUCTION



SOURCES: Board of Governors, Federal Reserve System.
Federal Reserve Bank of Dallas.

TEXAS ENERGY EMPLOYMENT



SOURCES: U.S. Bureau of Labor Statistics.
Federal Reserve Bank of Dallas.

Investments (cont.)

Because of the relative importance of the energy sector in total investment, the positive effects of lower oil prices are more than offset by the negative effects in the short run on oil and gas drilling investment. As shown in Chart 3, oil and gas well drilling has exceeded 25 percent of nonresidential investment in structures and 10 percent of total nonresidential investment. Although the share has fallen in recent years, oil and gas well drilling remains a major component of total investment.

Drilling Investment Falls Off Sharply

Energy investment has fallen sharply in 1986. Drilling activity, as measured by the rig count, is down over 60 percent from the first of the year and continues to fall. Furthermore, exploration and production budgets are still being reduced as hopes for prices above $20 per barrel diminish.

The full effect of depressed oil and gas drilling investment on measured GNP, however, has not been captured in the statistics. Oil and gas investment figures are based on estimates of footage drilled, which have not fallen as severely as the rig count (see Chart 4). Because of probable changes in reporting practices, the decline in footage estimates is likely to be underestimated.[1] Consequently, actual investment in the energy sector may be weaker than the estimate would suggest, making overall investment and economic growth slower than reported.

Revisions Will Show Greater Weakness

In the June 1986 GNP revision, the first-quarter estimates of oil and gas investment were reduced by 4 percent from the previous estimate. Further downward revisions are also likely as evidence mounts that estimates of footage drilled are overly optimistic, forcing estimates of GNP to be reduced. Furthermore, as long as oil prices remain low, weakness in energy investment will continue to act as a drag on overall economic growth.

—Ronald H. Schmidt

1. Estimates of footage drilled are taken from reports filed by drilling contractors after a well is completed. Because the reports may be filed years after the well is completed, estimates of current monthly footage are obtained by extrapolating returns already received using past reporting patterns. However, reporting lags change over time as the time available for keeping up with reporting responsibilities changes. With the present downturn in drilling activity, reporting lags can be expected to shorten. As a result, current estimates based on old reporting patterns will overestimate total footage because the percentage of reports received in initial months will be higher than average.

Energy Highlights is published quarterly by the Federal Reserve Bank of Dallas. Additional copies of most issues and subscription information are available from the Public Affairs Department.