

Federal Reserve Bank of Dallas October 1983

Market Forces Halt the Rise in Natural Gas Prices

The average price of natural gas has stopped rising and may be on its way down. Long-term contracts slowed the adjustment but did not prevent the market from responding normally to an emerging surplus of deliverable gas. This could add as much as the energy equivalent of 78 thousand barrels of oil to daily natural gas consumption by mid-1984.

Historical Background

Prior to 1981, federal regulation of natural gas prices held the average price of delivered natural gas below parity with the price of oil. However, falling oil prices, the emergence of an unregulated category of gas, and rising ceiling prices for other categories of gas gradually changed the situation. From early 1981 through early 1983, the difference between oil and gas prices slowly narrowed, as is shown in Chart 1. By late 1982, the price for natural gas delivered to industrial users appeared in danger of rising above that for residual fuel oil, a product of crude oil that is close substitute for industrial uses of natural gas.

Central to the fear that the average price of gas would rise above parity with fuel oil and continue upward were contractual commitments found in "take or pay" and "price escalator" clauses that mandated that pipeline companies purchase given minimum quantities of gas from its producers at ever increasing prices. In fact for some users, the price of gas rose above that

of oil in early 1983, when the price of oil dropped sharply and pipeline companies were slow in canceling their contractual commitments to purchase gas.

The Market Response

In early 1983, industrial energy consumers began switching from natural

gas to residual fuel oil, and pipeline companies found themselves apparently committed to purchasing more gas than they could sell. Pipeline companies began to use "market-out" clauses in their contracts to both cancel their contractual commitments to purchase gas and to pressure gas
(Continued on back page)

Futures Market May Not Affect Crude Oil Price

A futures market in crude oil opened in March 1983 on the New York Mercantile Exchange and the Chicago Board of Trade. Because oil products are important to the economy, the potential effects of the new market are of interest. A futures market in distillate oil, which is used as diesel and home heating fuel, has been in operation since 1978. Evidence from this market may indicate how the new futures market will affect crude oil prices. Although theory suggests that a futures market should stabilize prices in the spot market, a statistical analysis of the distillate oil market did not support that hypothesis. Hence, the effect of the new futures market on spot crude oil prices cannot be prejudged.

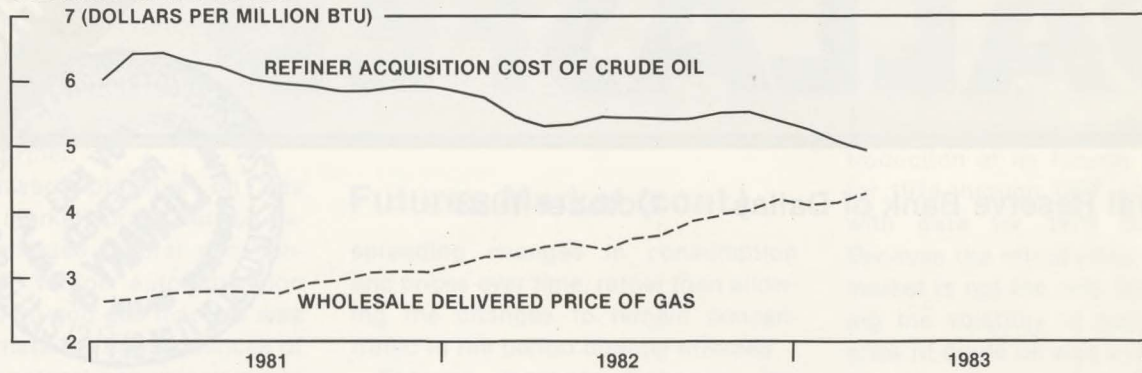
Theoretical background

A futures market allows participants to buy or sell contracts to accept or

provide future delivery of a particular good at a price determined in the present. This allows the people who normally buy or sell the physical commodity to "lock-in" the future price of the product. Others who believe that they have useful information on future price movements but do not normally trade in the physical commodity can buy or sell futures contracts and accept the profits or losses that arise from subsequent developments. Hence, futures market prices reflect expectations of future conditions.

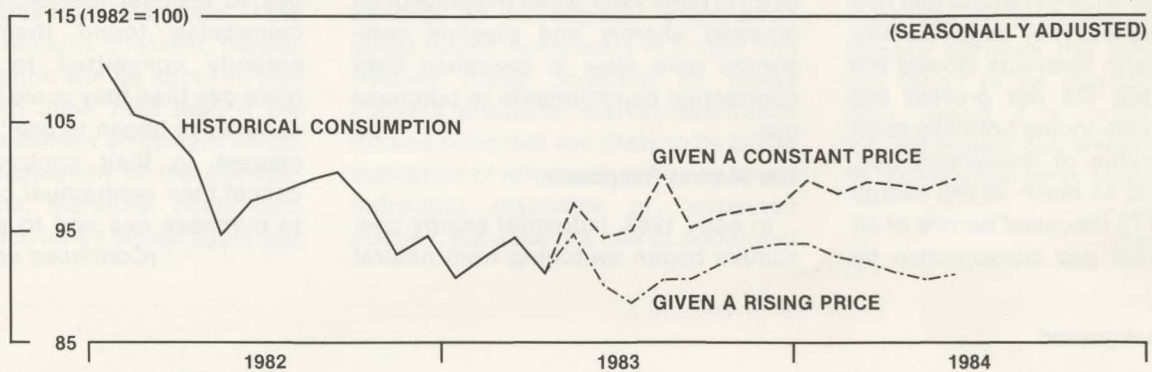
A futures market affects the behavior of prices and consumption over time. Even in the absence of a futures market, however, events that are expected to affect the supply of a good in the future will affect its current price and consumption. Quantities currently supplied and demanded depend on current and expected future prices,
(Continued on back page)

Chart 1
OIL AND GAS PRICES



SOURCES: U.S. Department of Energy.

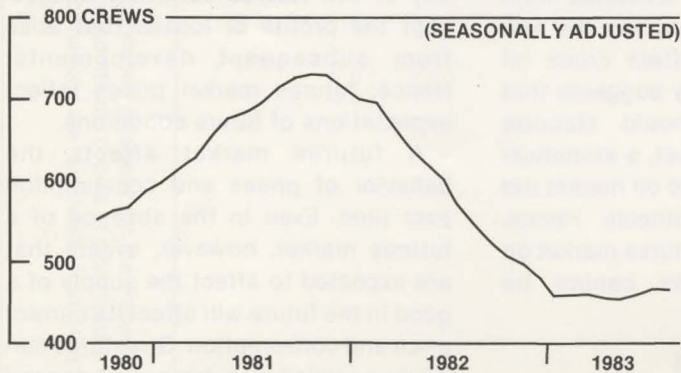
Chart 2
MODEL PROJECTIONS OF NATURAL GAS CONSUMPTION



SOURCES: U.S. Department of Energy.
Federal Reserve Bank of Dallas.

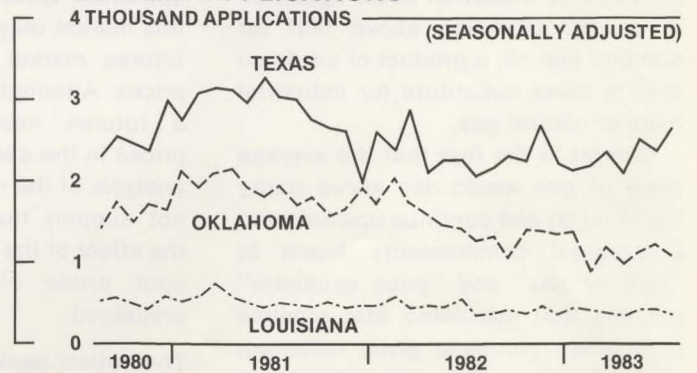
NOTE: Data contained in the regularly appearing charts and table have been revised to correct for an error in the seasonal adjustment procedure.

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

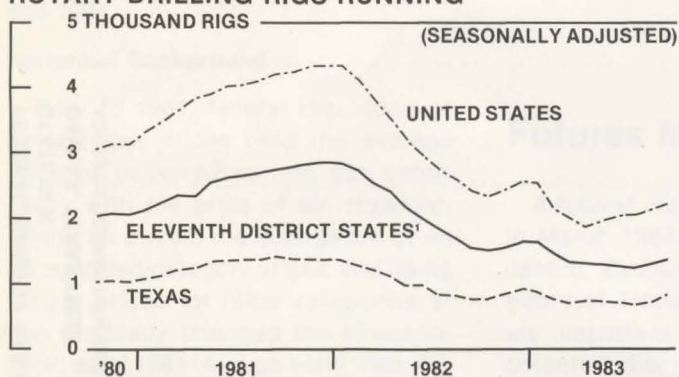
Most sectors of the oil and gas industry are showing signs of recovery.

- Decreasing real oil prices and an expanding U.S. economy have propelled a surge in refinery production. In both Texas and the nation refinery production continued to climb into the second quarter.
- With U.S. oil production relatively unresponsive to increasing demand for oil, imports have risen from 2.8 million barrels per day in March of this year to 5.1 million barrels per day in August.
- Leading indicators of drilling—the seismic crew count and well permit applications—rose through August. However, when seasonally adjusted, the seismic crew count registered a slight dip in August, following three months in which slight increases were posted.
- Well permit applications, reveal growing interest in drilling. However, the record number of August applications in Texas are misleading. The number of applications grew from 2,574 in

July to 10,021 in August, as drilling companies rushed to avoid paying a \$100 filing fee that was implemented in Texas in September.

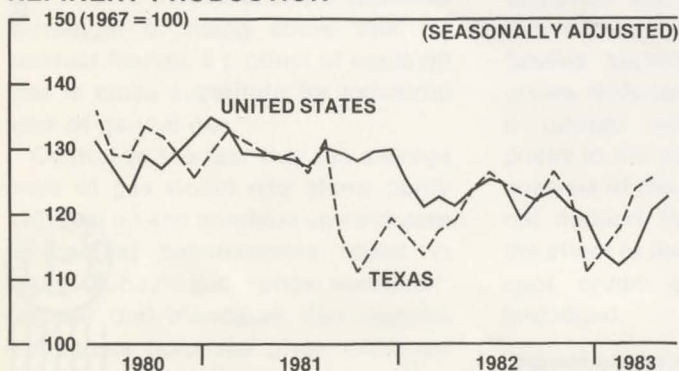
- Despite increased drilling, high inventories of equipment have slowed recovery in oilfield equipment manufacturing. On a seasonally adjusted basis, Texas employment in oilfield machinery rose 2.8 percent from April to August. However, employment in this industry remains 49 percent below the high of 88.3 thousand established in February 1982.
- Possible escalation of the war between Iran and Iraq is increasing the threat of a major disruption in oil supplies from the Middle East. Despite the price implications of such a disruption, the Rotterdam spot oil market and the London crude oil futures market have yet to show any lasting response, indicating that oil-traders have been discounting this threat.

ROTARY DRILLING RIGS RUNNING



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

REFINERY PRODUCTION



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

CRUDE OIL PRODUCTION AND NATURAL GAS EXTRACTION

(Seasonally Adjusted)

	Percent change from previous quarter				Daily average 1983:Q1 Thousand barrels
	1982		1983		
	Q2	Q3	Q4	Q1	
Oil					
Texas	-1.6	0.6	-0.2	-0.2	2,498 ²
District states ¹	-0.2	0.2	0.7	0.3	4,444 ²
United States	0.4	0.1	-1.0	0.7	8,681
Gas					Million cubic feet
Texas	-2.6	-2.3	-4.3	-3.8	15,762 ²
District states ¹	-3.2	-5.5	-2.2	n.a.	n.a.
United States	-2.7	-4.3	-3.9	-2.5	44,817

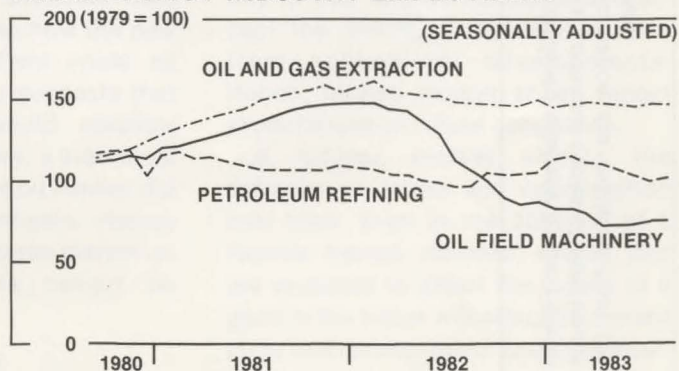
n.a. indicates not available.

1. Louisiana, New Mexico, Oklahoma, and Texas.

2. Preliminary figures.

SOURCES: U.S. Department of Energy.
Federal Reserve Bank of Dallas.

TEXAS ENERGY INDUSTRY EMPLOYMENT



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

Market Forces (cont.)

producers into accepting lower prices. Although pipeline companies are also seeking legislation to cancel take or pay clauses in existing contracts, government intervention does not appear necessary to prevent gas prices from rising further.

The downward pressure on gas prices from market forces can be expected to increase natural gas consumption. A vector autoregression model of the oil and gas markets was used to estimate the consequences of the price of natural gas remaining at parity with the price of oil, rather than continuing to rise as previously expected. As seen in Chart 2, according to the estimates from this model, if the price of gas remains constant, natural gas consumption will be about 10 percent higher in June 1984 than if the price of gas resumes an upward climb. Successful resolution of the contractual problems, therefore, could contribute as much as 4.4 billion cubic feet

in daily natural gas consumption (the energy equivalent of 78 thousand barrels of crude oil) by mid-1984. Some of this increase can be expected to come at the expense of oil imports.

—Ronald H. Schmidt
—Stephen P. A. Brown

Futures Market (cont.)

spreading changes in consumption and prices over time, rather than allowing the changes to remain concentrated in the period directly affected.

Futures markets enhance the reallocation process by reducing the transactions cost facing an individual who wishes to capitalize on what he believes to be superior information about future movements in prices. The trading made possible by these markets produces market-determined futures price that are likely to be better indicators of informed opinion than are individual estimates of "expected prices." Because the use of additional

or more reliable information is rewarded in these markets, more of it is brought to bear on the determination of prices.

Experience with distillate futures

To test whether variation in the price of distillate oil was reduced by the introduction of its futures market, data for 1974 through 1977 were compared with data for 1979 through 1982. Because the introduction of a futures market is not the only factor influencing the volatility of spot prices, the price of crude oil was used as a proxy to remove the influences of other economic phenomena. Although the remaining variation was 26 percent lower in the period from 1979 through 1982 than in the earlier period, the difference between the two series was not found to be statistically significant. Hence, it is unclear whether a futures market can smooth the shocks to which crude oil is subject.

—Daniel B. Keys
—Gary M. Ziegler

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