

Oil Prices Lead, Land Prices Follow

By Ali Anari and Charles E. Gilliland

Since the discovery of petroleum reserves at Spindletop, the Texas oil industry has played a key role in the state's economy. The industry enriched wildcatters, provided windfalls to landowners and fueled activity in the general commerce of the state.

Fluctuations in oil prices impact all of these economic players, filling their pockets with cash when prices rise and leaving them scrambling to cover expenses when prices fall.

The Real Estate Center at Texas A&M University developed an econometric model of rural land prices that revealed a pattern of strong positive correlation between Texas oil prices and statewide and regional rural land prices.

Impact of Oil Prices on Land Prices

This expectation results from the nature of demand for Texas rural acreage. First, by providing space for a variety of activities, land serves as an essential element in the production and distribution of goods and services. For owners focused on production of a commodity, land is a capital asset. In a competitive market populated with these production-driven users, the price of land equals the present value of projected future streams of net revenues much like a company's stock price equates to the present value of future dividend streams. Two major factors determine land prices, expected net revenues and the discount rate applied to those future cash flows.



Figure 1. Price Per Barrel of West Texas Intermediate Crude Oil



Source: St. Louis Federal Reserve

Land prices are influenced by all factors that affect revenue streams. There are several channels of the effects of higher oil prices on land prices. Higher oil prices mean more royalty incomes for owners of oil- and gas-producing land. In addition, higher oil prices enhance the incomes of oil company shareholders and oil industry workers, contributing to an overall expansion of the economy. This added prosperity feeds money into the pockets of individuals who see the land as an asset capable of producing recreational experiences, advancement of the environment, or protecting a neighborhood lifestyle. These individuals often compete with the bottom-line-oriented producers for land. High oil prices could conceivably increase the price this type of buyer might pay to pursue those activities. The competition among “recreational buyers” and commercial land users determines land prices. Clearly the fluctuation of oil prices could influence the results of bidding for rural land.

Texas Rural Land Price Data

The Center’s time series of Texas rural land prices includes sales prices for land in seven distinct Texas regions plus a statewide time series of composite averages from 1966 to 2013. Regional prices are the average of median prices reported in particular size categories.

The statewide price indicator consists of an average of those regional price indicators weighted by the proportion of total Texas acreage found in each region. (See *Characteristics of Texas Land*

Land Market Regions

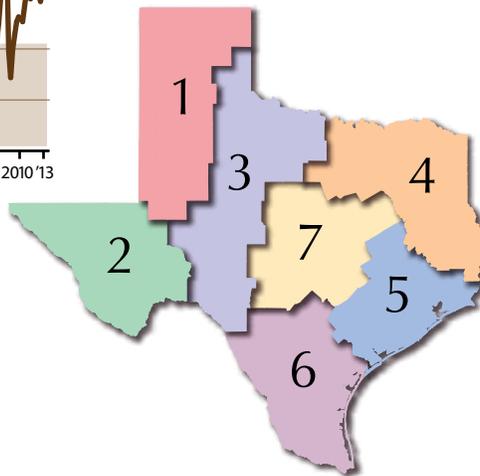
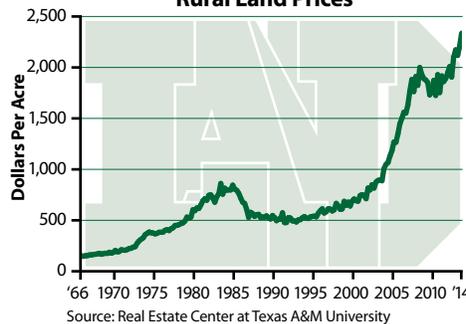
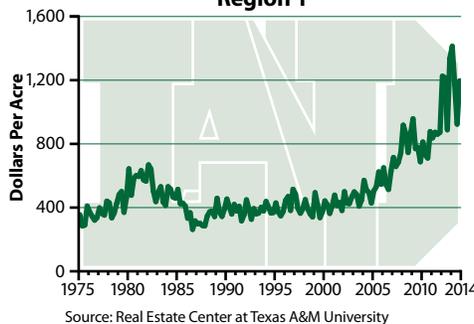


Figure 2. Texas Statewide Rural Land Prices



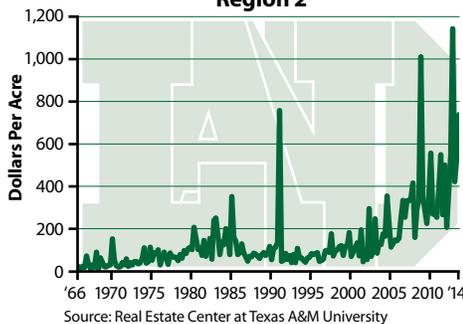
Source: Real Estate Center at Texas A&M University

Figure 3. Texas Rural Land Prices Region 1



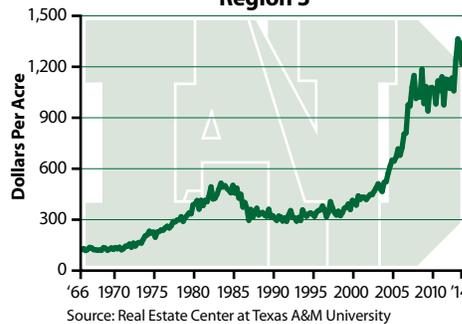
Source: Real Estate Center at Texas A&M University

Figure 4. Texas Rural Land Prices Region 2



Source: Real Estate Center at Texas A&M University

Figure 5. Texas Rural Land Prices Region 3



Source: Real Estate Center at Texas A&M University

Markets: A Regional Analysis at www.recenter.tamu.edu/pdf/1937.pdf for a detailed description of the regions.)

An Intimate Relationship

The price per barrel of West Texas intermediate crude oil, a grade of petroleum used as a benchmark in oil pricing, is shown from first quarter 1966 to fourth quarter 2013 (Figure 1). Figure 2 presents the Texas statewide price per acre of rural land over the same period. The two figures show several distinct features.

First, there is strong and close comovement of the two price series after October 1973 (the Yom Kippur war) when the balance of power in global oil markets shifted in favor of countries in the Organization of the Petroleum Exporting Countries (OPEC). Second, both Texas oil prices and rural land prices evidence four distinct periods of comovement. Third, trends in Texas land prices have followed oil prices with lags of one to three years. Finally, Texas land price volatility has also been related to oil price volatility, especially in the aftermath of the U.S. economy’s recovery from the Great Recession.

In the first comovement period, Texas oil prices and rural land prices embarked on an upward trend at the end of 1973. The rise in market prices for oil stalled in 1980, but Texas land prices continued their expansion until 1985. Regional differences in response to oil prices are discussed in the next section.

The continued uptick in Texas rural land prices from 1980 to 1985 despite falling oil prices resulted from exuberance on the part of rural land market participants, presumably based on expectations that oil prices would begin to increase again. Buyers from that period paid a high price

for their optimism when land prices followed oil prices in a pronounced slide.

The second period of comovement, from 1985 to 2000, saw oil prices stagnate. Texas rural land prices followed suit.

The third period of comovement lasted from 2000 to 2008, when oil price markets experienced a steep upward trend, reaching an all-time high of more than \$120 per barrel (quarterly average) in second quarter 2008. It was also a period of low interest rates implemented by the Federal Reserve in the aftermath of the 2001 recession and of credit availability resulting in the housing boom and bust of the Great Recession of 2008–09. Texas rural land markets experienced rapidly increasing prices after 2000 due to higher oil prices, lower interest rates and more credit availability.

The post-Great Recession era is the fourth period of comovement. Oil prices fell from record highs in 2008 but again trended upward, although with increasing volatility. Texas rural land markets currently appear to be following a similar path with prices advancing strongly.

Figures 3 through 9 show strong and close comovements between oil prices and regional rural land prices, but the speed of the response of rural land prices to oil price movements varies across regions. The response time of regions 1 and 5 to the slowdown in oil prices after 1980 was shorter than regions 4, 6 and 7. Region 1 contains

Midland and Ector counties and several other nearby counties heavily involved in oil production. The petrochemical complex of major oil companies lies in Houston, in the heart

of region 5. Regions 4, 6 and 7 involved more non-oil-related influences than 1 and 5, suggesting that those regions had countervailing forces driven by those influences.

Rural Land Price, Oil Price Correlations

While Figures 2 through 9 clearly show strong positive comovements of the two time series, the authors employed a number of statistical methods to formally test the strength of the relationships. Pearson's correlation coefficient provides a simple statistical test for the strength of the relationships between two or more variables. The statistic has a value between plus and minus one, both inclusive. A coefficient

that is positive and close to one suggests strong comovement between the oil and land prices.

The estimated coefficients between Texas

oil prices and statewide and regional land prices presented in the table reveal strong correlation. They also indicate regional differences in the impact of oil price changes on regional land prices. Region 2 showed the smallest correlation. However, that area is sparsely populated, with relatively few reported land sales. Therefore, the low correlation may reflect the lack of information on land prices rather than a disconnect between oil and land prices.

Oil prices are determined in international markets mainly by OPEC export policies. For Texas rural land markets, oil prices are exogenously determined. Texas rural land prices have no impact on oil prices. Correlations between rural land prices and Texas oil prices suggest impact of oil prices on land prices either directly or indirectly through the impact of oil prices on Texas incomes.

Changes in Texas rural land prices follow from changes in oil prices. This in turn leads to changes in direction trends in statewide and regional rural land prices. The Real Estate Center

has developed an econometric model of the Texas rural land market that includes rural land prices and quantities, Texas total personal incomes and Texas oil prices. The model

is updated each quarter and used for analysis of the state's rural land market. 📍

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Figure 6. Texas Rural Land Prices Region 4



Figure 7. Texas Rural Land Prices Region 5



Figure 8. Texas Rural Land Prices Region 6

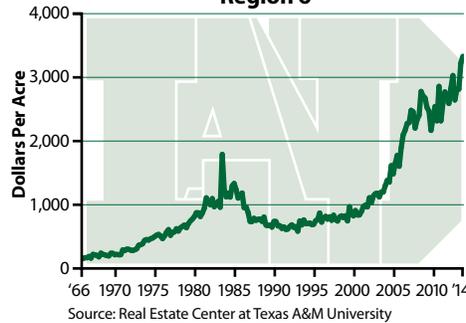
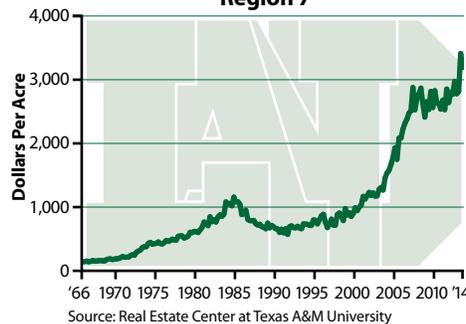


Figure 9. Texas Rural Land Prices Region 7



Correlation Coefficients Between Texas Oil Prices and Texas Rural Land Prices

Coefficient	Statewide Average	Region						
		1	2	3	4	5	6	7
	0.96	0.90	0.69	0.95	0.93	0.94	0.95	0.95

Source: Real Estate Center at Texas A&M University

THE TAKEAWAY

An econometric model developed by the Real Estate Center shows a strong correlation between oil prices and Texas rural land prices, both statewide and by regions.



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The Real Estate Center at Texas A&M University is the nation's largest publicly funded organization devoted to real estate research. The Center was created by the Texas Legislature in 1971 to conduct research on real estate topics to meet the needs of the real estate industry, instructors and the public.

Most of the Center's funding comes from real estate license fees paid by more than 135,000 professionals. A nine-member advisory committee appointed by the governor provides research guidance and approves the budget and plan of work.

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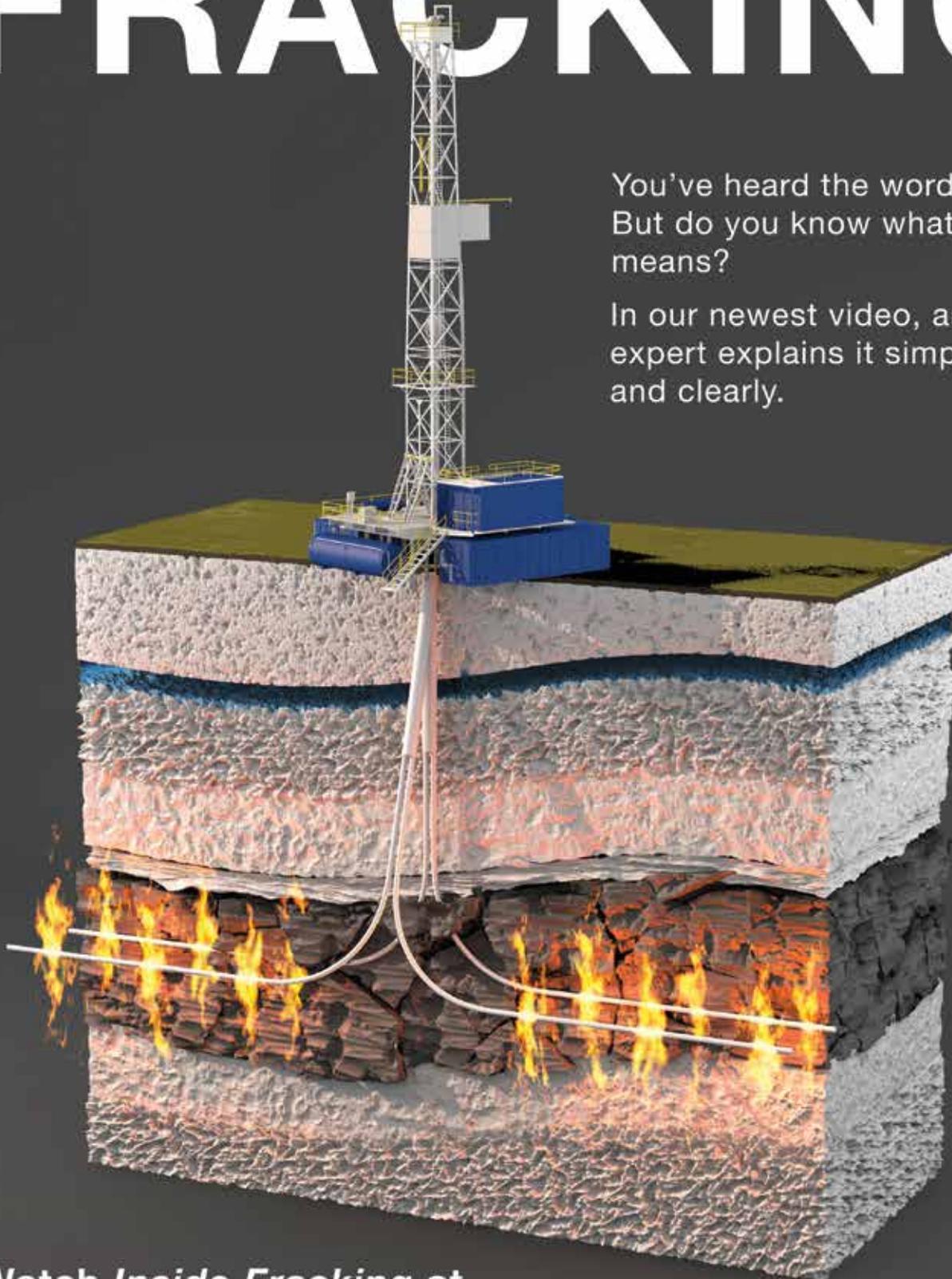
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