Energy Prices and the Oklahoma Economy

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INTRODUCTION

The recent surge in crude oil prices past the $50 per barrel psychological threshold raises the question of the net overall effect that higher energy prices have on the Oklahoma economy. Does the fact that the state remains an important producer of oil and gas mitigate, or even more than offset, the negative effects of higher energy prices? Are higher energy costs *good* for Oklahoma?

These are somewhat paradoxical questions in the sense that rising energy prices are well known to have a negative influence on U.S. economic activity.[1] All but one of the postwar recessions have been preceded by rapid energy price increases, including the most recent slowdown in 2001.

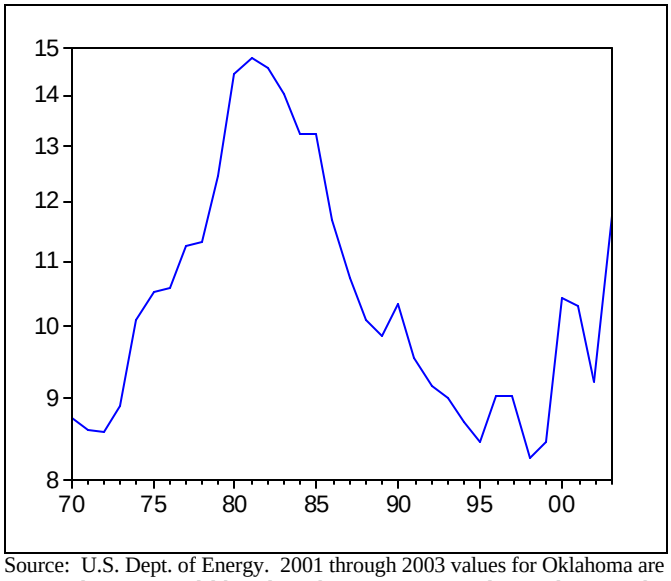
ENERGY VS. NON-ENERGY STATES

The equation is somewhat different for energy states, as they enjoy a degree of insulation from higher energy prices. In Oklahoma, higher prices stimulate business activity in the state's energy industry and are immediately reflected in higher revenues for oil and gas-related firms. This in turn stimulates the hiring of workers in the energy industry and eventually provides stimulus to the overall state economy.

In non-energy producing states the story is not so rosy - the net effect of higher energy costs is unambiguously negative. Rising energy prices serve as a classic restrictive supply side shock that requires nearly all participants in the state economy to pay more to satisfy energy needs that are largely fixed in the short run. Higher energy costs immediately reduce the purchasing power of households, alter the cost structure of most firms, and, ultimately, cause job losses at the state level. Fixed-income households, along with firms that are heavy users of energy in the production process, suffer disproportionately.

Rising energy costs are felt within the Oklahoma economy as well, and are a critical factor in determining the levels of both real output and hiring. In 2003, residential, commercial, industrial, and transportation users in Oklahoma spent an estimated $11.7 billion on direct energy use (Figure 1), or roughly 38 percent more than the $8.5 billion spent as recently as 1999. The state economy is currently coping with a more than $3 billion cumulative real increase in energy costs over the past four years, the first major increase in real energy expenditures in more than two decades.

Figure 1
Oklahoma Real Total Energy Expenditures
$Billions, CPI-U 2003=100



Source: U.S. Dept. of Energy. 2001 through 2003 values for Oklahoma are estimated using a model based on changes in U.S. total expenditures in the period.

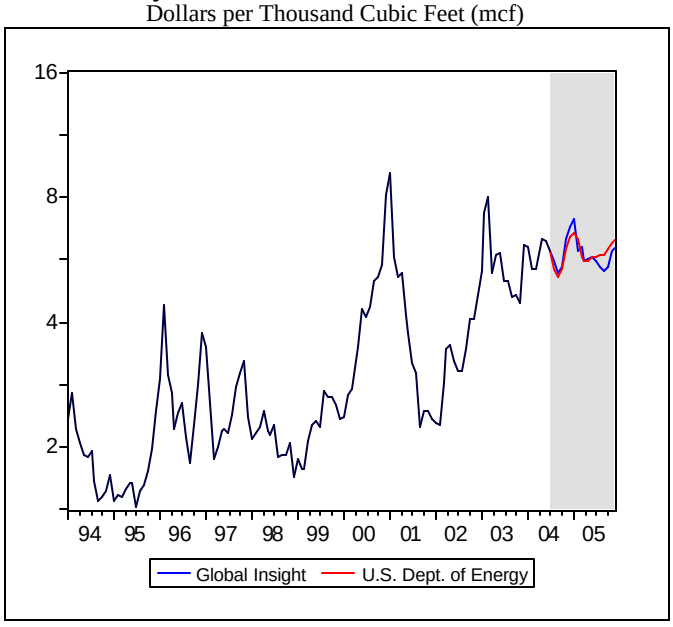
This is the basic dilemma faced by energy-producing states. Higher energy prices impart significant costs on most participants in the economy, while they simultaneously provide stimulus to a key productive sector. Disentangling the exact net effect requires us to examine both the costs and benefits in more detail.

JOB SPILLOVER EFFECTS

The key issue in evaluating the net impact of the current surge in energy prices on Oklahoma is the degree to which the added business activity and job growth in the energy sector spills over to the overall state economy. The linkages between oil and gas and the state economy[2] have the potential to produce multiplier, or ripple, effects that can be quite stimulative. Taken to the extreme, as in the oil boom and bust, energy price changes can even govern the state's overall rate of economic growth. Non-energy states enjoy no such offsetting job spillover effect when presented with higher energy prices.

We can look to two factors to determine whether or not the stimulative influence of the state's energy sector can offset the added costs of rising energy prices: 1) the size and permanence of the increase in energy prices, and 2) the overall sensitivity of the state economy to changes in energy prices. Both work together to dictate the net stimulus from rising energy prices. The higher and more sustained the move in prices, and the more sensitive the state economy is to energy price changes, the more likely the state will benefit from rising energy prices.

Figure 2
Henry Hub Natural Gas Price Forecast
Dollars per Thousand Cubic Feet (mcf)



ENERGY PRICES & FORECASTS

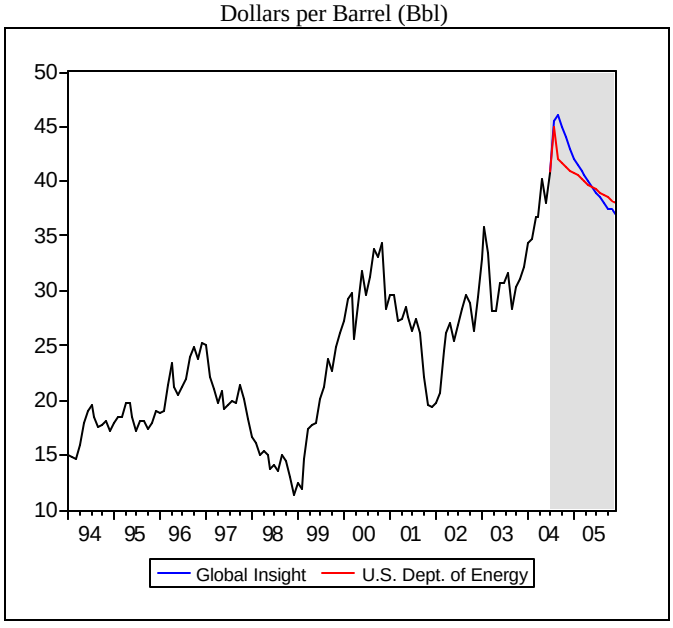
There is little doubt that the current increase in energy prices is sufficient to influence state economic activity. Market prices for both natural gas and crude oil are currently hovering near historical highs (Figures 2 and 3). Following the 2001 spike in natural gas prices to $10/mcf and the subsequent rapid plunge back to $3/mcf, prices for Henry Hub have since moved back up and remained in the $6/mcf range the past 18 months.

Crude prices have largely mirrored the recent movements in natural gas as West Texas crude moved from a low of $12/Bbl in early 1999 to $35/Bbl in late 2000, only to retreat to $18/Bbl one year later. The current upward march to $50/Bbl required a steady progression in prices over more than two years.

Whether prices are sustainable at these levels remains uncertain. Energy price forecasts by Global Insight[3] and the U.S. Department of Energy[4] suggest that we are entering an extended period of high crude oil and natural gas prices. Both forecast groups argue that the recent upward move in prices will have a long-term residual effect on the baseline price of crude oil and natural gas. Factors cited as important in altering the long-run pricing fundamentals include international production capacity uncertainty and surging demand for energy in China.

Their forecasts for natural gas (Figure 2) suggest a continuation of prices in the $6.00/mcf range through 2005, a level more than double the average 1990s price. Forecasts for crude (Figure 3) call for some moderation in 2005, but for West Texas Intermediate to continue to trade in the $38-40/Bbl range through next year.

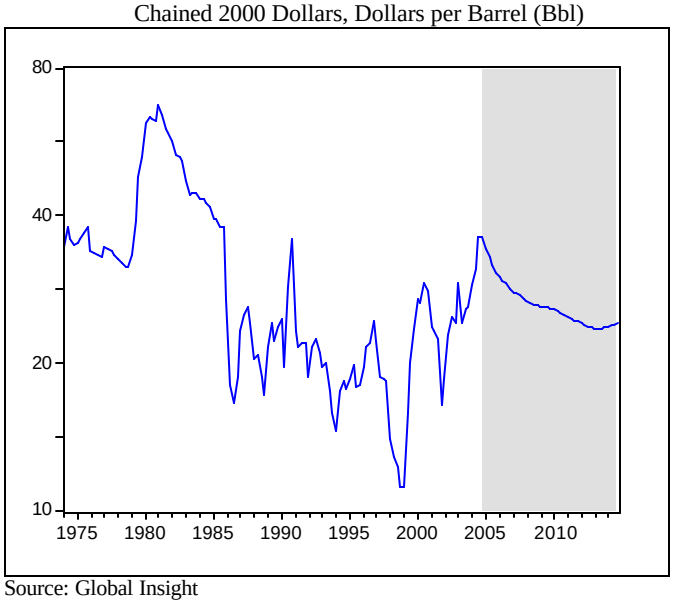
Figure 3
West Texas Inter. Crude Price Forecast
Dollars per Barrel (Bbl)



These forecasts, however, are in current dollars and ignore the more fundamental relationship between

economic activity and the inflation-adjusted price of energy. Unadjusted data can easily create an illusion that exaggerates the size of a price increase. Figure 4 shows the inflation-adjusted price of imported crude to refiners since 1975 along with Global Insight's forecast through 2015.

Figure 4
Real Price of Imported Crude Oil to Refiners
Chained 2000 Dollars, Dollars per Barrel (Bbl)



Source: Global Insight

Three aspects of Figure 4 deserve mention. First, we have, in fact, experienced a significant rise in real crude oil prices. Real prices have tripled since the major bottom in 1999 and more than doubled since the intermediate bottom in 2001. Second, despite the recent increase, prices still remain at only half the real level seen at the peak in 1981. This suggests that, although the current price episode is meaningful, it is not capable of generating an economic stimulus to the state that is in any way comparable to that enjoyed in the oil boom. It also means that the drastic adjustment in energy usage by firms and households that occurred in the 1970s and early 1980s will likely not be necessary in this price cycle. Third, Global Insight expects crude oil prices over the next decade to stay at the upper end of the range of real market prices experienced since 1986.

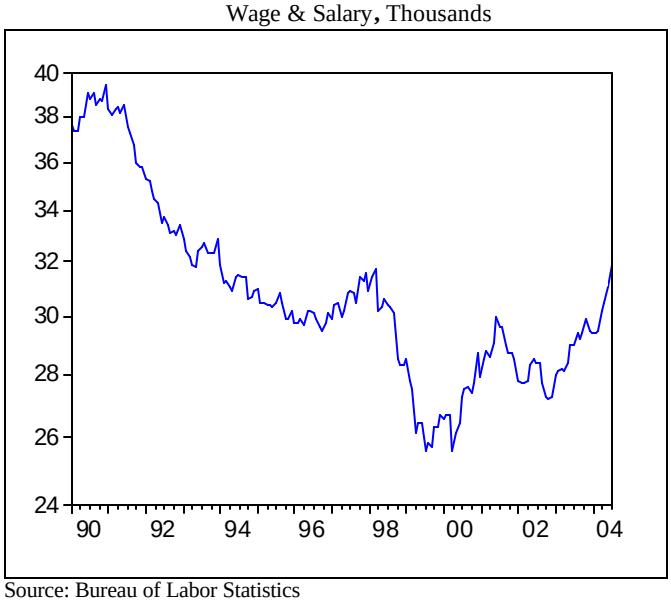
ENERGY PRICES AND OKLAHOMA JOBS

Recent job data indicate that the state's oil and gas sector is benefiting substantially from the current surge in energy prices, expanding by 20 percent, or 6,000 new jobs, since early 2000 (Figure 5). These overall job gains occurred despite the Tulsa metro area losing 4,000, or 50 percent, of its oil and gas wage and salary jobs in a steady decline since 1998.

Furthermore, the reported job numbers understate the true employment and earnings impact of the energy sector since more than half of all oil and gas-related employment in the state comprises self-employed proprietors who typically are not counted in the major employment data collection programs.

Economic impact models can provide some indication of the size of the direct stimulus to the state economy from newly added oil and gas jobs. Multipliers based on a recent input-output model of Oklahoma suggest that each new oil and gas industry job indirectly supports slightly more than two additional jobs in other industries statewide.[5] Hence, the energy induced job gains in the oil and gas sector since the upturn in energy prices likely support an estimated 12,000 to 15,000 additional jobs statewide. The energy sector undoubtedly served as an important source of stimulus during the most recent recession as well.

Figure 5
OK Natural Resources & Mining Employment
Wage & Salary, Thousands



Source: Bureau of Labor Statistics

Economic impact multipliers, however, ignore the inevitable job losses in the non-energy side of the state economy as energy costs increase. More capable models are needed in order to measure the net job impact resulting from the simultaneous influence of the negative effects from higher energy costs and the positive effects from the surge in oil and gas activity.

A study of this phenomenon by the Federal Reserve Bank of Dallas[6] provides some empirical evidence on the response of state-level employment to changes in oil prices. The findings suggest that Oklahoma is one of less than a dozen energy states that enjoy net job gains in response to higher real oil prices, with Oklahoma

trailing only Wyoming in the magnitude of the hiring response. In 1982 during the oil boom, a ten percent increase in real oil prices produced an estimated 2.91 percent increase in Oklahoma non-farm employment, or approximately 35,000 jobs in 1982.

However, the study finds that the stimulative job effect is diminishing rapidly over time as energy states diversify away from the energy industry. Oklahoma is no exception to this trend, as oil and gas workers now comprise only 2 percent of total wage and salary employment statewide, down from more than 8 percent at the height of the oil boom in 1982.

The study further finds that, for 1992, the estimated job response for Oklahoma declines to only 0.95 percent. Projections for 2000 suggest a further decline to a 0.58 percent increase in hiring, or approximately 8,500 net additional jobs statewide in response to a 10 percent increase in real oil prices.

REAL STIMULUS OR JOB SWAP?

Given the magnitude of the recent energy price increase, the findings of the Dallas Fed study, and recent job data, it is likely that Oklahoma continues to enjoy a positive, albeit much more modest, overall job stimulus from energy price increases.

What is troubling, however, is that unless the price increase is somewhat permanent, the outcome can just as easily be interpreted as nothing more than a temporary job swap, as workers in industries that benefit from high energy prices prosper at the expense of workers in industries that are hurt by higher energy prices. Granted, the oil and gas industry pays the highest wages among all major industry sectors in the state and generates tremendous economic multiplier effects that benefit all quarters of the state, but unless the changes are long-lived they may simply generate inefficiency as the economy gropes to adjust to uncertain market conditions.

If the recent price surge instead proves temporary as in 2000-2001, the state economy will merely enjoy a one-time economic boost in exchange for a great deal of future economic uncertainty, as the positive effects of rising prices are quickly reversed through the same adjustment mechanism by way of falling prices.

TAX EFFECTS

There are other potential benefits to higher energy prices. An often-overlooked dimension that deserves mention is state tax revenue. Oil and gas severance taxes are value-based in Oklahoma as in most energy states, and, since production is highly stable, tend to move up and down along with market prices. Oklahoma is currently enjoying a prolonged windfall from elevated energy prices, as state oil and gas severance taxes will exceed $650 million in fiscal year 2004. The added tax revenue is not a direct burden to Oklahoma firms and residents, as the tax is ultimately passed on to end users, a significant portion of whom reside out of state.

In addition, because higher energy prices tend to accompany recessions, the added severance tax revenue can provide much-needed counter cyclical support to state budgets and reduce the fiscal sting of a combination of high energy prices and weak economic conditions. This was evident in Oklahoma during the most recent economic downturn as strong oil and gas tax revenue eased the budget burden during the worst state fiscal crisis since the oil bust.

Oklahoma state government remains somewhat dependent upon highly volatile and unpredictable severance tax revenue to fund state services. In fiscal year 2002,[7] Oklahoma ranked seventh among the states in severance taxes as a percent of total taxes, with 6 percent of Oklahoma state tax revenue derived from oil and gas production (Figure 6). Texas collects the most severance tax revenue among the states, yet derives only 3.4 percent of total taxes from mineral extraction. Only eight states derive more than 5 percent, and only a dozen derive more than 1 percent, of their tax revenue from energy production.

Figure 6
State Severance Tax Revenue
Fiscal Year 2002, $Millions

State	Severance Taxes	Total Taxes	Severance as % of Total
Alaska	551,293	1,089,504	50.6%
Wyoming	301,594	1,094,402	27.6%
New Mexico	453,397	3,628,055	12.5%
North Dakota	138,244	1,117,299	12.4%
Louisiana	493,662	7,356,936	6.7%
Montana	88,882	1,442,731	6.2%
Oklahoma	364,459	6,052,680	6.0%
West Virginia	177,093	3,551,756	5.0%
Texas	974,727	28,662,395	3.4%
Kentucky	187,416	7,974,690	2.4%
Kansas	66,810	4,808,361	1.4%
Alabama	65,667	6,509,765	1.0%
Colorado	57,130	6,923,171	0.8%
Utah	28,972	3,925,382	0.7%

Source: U.S. Census Bureau, State Government Finance.

For Oklahoma and most other energy states, reliance upon severance taxes has declined significantly since the worldwide oil price collapse of 1986. At the

height of the oil boom, severance taxes comprised nearly one-third of the Oklahoma state budget. While non-energy states do not have access to this often-substantial source of tax revenue, they also do not have to face the unpredictable volatility of energy prices and the related budgetary uncertainty that comes along with a severance tax stream.

LOCAL AREA EFFECTS

A final note concerns the location where the expected economic effects of rising energy prices are likely to take hold across the state. The negative effects of higher costs will impact nearly every household and firm in Oklahoma, but any potential positive job effects from higher energy prices are unlikely to be distributed evenly across the state. A recent study[8] of the local impact of oil and gas activity in Oklahoma illustrates that energy production remains heavily concentrated in a small number of Oklahoma's 77 counties: 22 counties produce approximately 80 percent of state crude oil output, while 19 counties account for 80 percent of the natural gas produced statewide.

The state's oil and gas sector jobs are also highly concentrated in the Oklahoma City and Tulsa metropolitan statistical areas (MSAs), with nearly 40 percent of the industry's wage and salary workforce located in the counties comprised by the state's two major metro areas. Income is even further concentrated within the two large MSA hub counties, with Tulsa and Oklahoma Counties alone accounting for almost half of state oil and gas wage and salary income. However, recent trends suggest that Tulsa and Oklahoma City are unlikely to benefit equally. The continuing decline of the oil and gas sector in Tulsa coupled with the strong growth of the sector in Oklahoma City, suggests that the Oklahoma City area will remain the primary beneficiary of higher energy prices.

A large portion of the remaining oil and gas wage and salary jobs are located in a second tier of counties including Carter, Garfield, Kay, Osage, Stephens, and Washington Counties, most of which are home to either the headquarters or a large branch facility of one or more oil and gas companies. Other areas of the state will benefit to the degree that self-employed oil and gas workers operate locally, but are unlikely to detect any significant change in local economic activity in response to higher energy prices.

WEIGHING THE EVIDENCE

The evidence suggests that the Oklahoma economy remains sensitive to prices in the energy complex, though certainly not to the degree experienced during the oil boom. The oil and gas sector will continue to prosper when prices rise and possibly generate small positive job spillover effects to the overall economy. Higher energy prices will also generate windfall severance tax revenue and provide some added diversification and counter cyclical economic stimulus to the state economy. A healthy energy-producing sector simply provides the state with highly desirable compensating benefits that most other states never enjoy. The catch is that higher energy costs will always exert offsetting negative pressure on the non-energy sectors of the state economy and will likely be felt by all parties. The current surge in energy prices over the past four years has added more than $3 billion to the state's annual energy bill.

So, is it possible for the state to be better off at current energy price levels? Maybe. But only modestly at best, and it would require that prices remain at these levels for an extended period of time while not triggering costly major adjustments in energy usage by households and firms. If prices retreat instead, the result may simply be a temporary job swap between the energy and non-energy sectors coupled with added uncertainty for state producers and consumers.

Ideally, we all want stable energy prices at levels that encourage growth in the state's oil and gas sector but that do not distort the use of energy in the state economy. Whether policymakers, the energy industry, and energy consumers can find this middle ground remains to be seen. Regardless of the outcome, the continuing maturation of the state's oil and gas industry due to weakening fundamentals will eventually eliminate any positive job response to higher energy prices. Oklahoma will then suffer under rising energy costs just like most other states.

ENDNOTES

[1] For an accessible introduction to the role of energy prices in business cycles, see: Brown, Stephen P. A. and Mine K. Yucel, and John Thompson. "Business Cycles: The Role of Energy Prices." Research Department Working Paper 0304. Federal Reserve Bank of Dallas.

[2] For a description of the role of the oil and gas sector in the state economy see: Snead, Mark C. "The Economic Impact of Oil and Gas Production and Drilling on the Oklahoma Economy." 2002. Oklahoma Commission on Marginally Producing Oil and Gas Wells. Available online at http://economy.okstate.edu/.

[3] Energy Market Analysis. September 2004. Global Insight.

[4] Short-Term Energy Outlook. September 2004, Energy Information Administration, U.S. Department of Energy.

[5] The reported multipliers are from an IMPLAN input-output model of the State of Oklahoma using the 2001 Oklahoma IMPLAN dataset. Estimated oil and gas-related type II multipliers are: Oil and Gas Extraction, 3.07; Drilling Oil and Gas Wells, 2.48; Support Activities for Oil and Gas Operation, 3.90. For details, refer to IMPLAN Professional: User's guide, analysis guide, data guide. Minnesota IMPLAN Group, 1998. Stillwater, MN.

[6] Brown, Stephen P. A. and Mine K. Yucel. "Energy Prices and State Economic Performance." Second Quarter, 1995. Economic Review – Federal Reserve Bank of Dallas.

[7] Fiscal year 2002 is the latest year for which comparable data for all 50 states is available.

[8] Snead, Mark C. "The Local Impact of Oil and Gas Production and Drilling in Oklahoma." 2002. Oklahoma Commission on Marginally Producing Oil and Gas Wells. Available online at http://economy.okstate.edu/.