OKLAHOMA OIL & GAS BRIEFING

January 23, 2006

ENERGY PRICES & OKLAHOMA'S MINING SECTOR

Given Oklahoma's experience with the Oil Boom & Bust in the mid-1980's, one concern some Oklahomans may have with the recent increase in energy commodity prices is that Oklahoma's economy would experience a similar economic downturn if energy commodity prices were to plummet as they had in the mid-1980's. The accompanying table and graph provide some background.

1975-1982: BOOM YEARS

In the seven years between 1975 and 1982, natural gas prices increased 459.1% (average annual growth of 27.9%/year) and crude oil prices increased 271.8% (or 20.6%/year). Even adjusting for inflation during this time period, natural gas prices still increased 218.2% (or 18.0%/year) and crude oil prices rose 111.6% (or 11.3%/year).

Additionally during this time frame, the US economy suffered two recessions and relatively high rates of inflation with prices increasing as much as 13.3% between 1978 and 1979 and an average annual increases of 8.4% per year.[1] Despite the combined setbacks, total nonfarm employment grew 15.4% (or 12.8 million jobs) in the US economy, but partially attributable to the higher energy commodity prices, Oklahoma's job growth rate (32.6% or 323,000 jobs) more than doubled the US growth rate.

These significant energy commodity price increases provided the incentive to increase domestic production of energy resources in the United States, especially Oklahoma and other energy-rich states. Oklahoma's Mining sector employment peaked in 1982 at 106,410 jobs and in that year accounted for 8.1% of the state's total nonfarm employment, which also was double the 1975 proportion of 4.0%. Oklahoma's Mining sector employment increased 162.8% (or 65,914 jobs) during the 1975-1982 time frame when it doubled its share of the state's nonfarm employment. Comparatively, the US Mining sector accounted for 0.9% of nonfarm employment in 1975, accounted for 1.2% of nonfarm employment in 1982, and posted a 50.9% growth rate over the same time frame.

Therefore, not only was the Mining sector relatively more important to the state's economy than the nation's economy in 1975, but it also grew in importance to the state's economy in these seven years by accounting for a greater proportion of the state's employment by 1982.

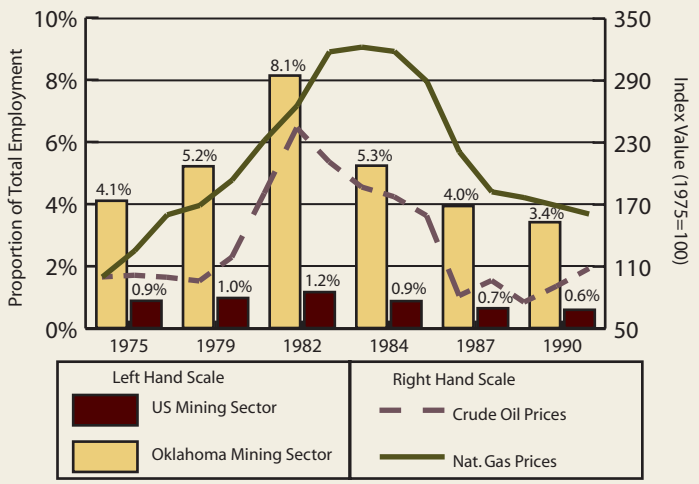
More dramatic than the employment proportion that the Mining sector claimed of the state's total employment is the proportion of the Gross State Product (GSP) that was claimed by the Mining sector. In 1977 (the earliest available data for GSP at the Bureau of Economic Analysis), the Mining sector accounted for 13.0% of Oklahoma's GSP and grew to account for 21.4% of the state's GSP by 1982. Comparatively these proportions for the US

Table 1: Price & Employment Variables: 1975-2005

	1975	1982	1987	2000[2]	2005[3]
Natural Gas Prices[4]	$0.44/tcf	$2.46/tcf	$1.67/tcf	$3.68/tcf	$6.62/tcf
Crude Oil Prices[4]	$7.67/bbl	$28.52/bbl	$15.4/bbl	$26.72/bbl	$49.16/bbl
US Nonfarm emp.	83,250,000	96,042,000	109,287,000	131,792,000	133,546,000
US Mining sector emp.	753,000	1,136,000	720,000	599,000	626,900
US Mining proportion	0.9%	1.2%	0.7%	0.5%	0.5%
OK Nonfarm emp.	983,034	1,306,092	1,204,612	1,489,400	1,494,900
OK Mining sector emp.	40,496	106,410	47,598	27,000	32,200
OK Mining proportion	4.1%	8.1%	4.0%	1.8%	2.2%

1. National Bureau of Economic Research identifies January 1980 to July 1980 as a recession as well as July 1981 to November 1982 as a recession.
2. Employment data in 2000 & 2005 is NAICS based data. Employment data before 2000 is SIC based data.
3. Data series in 2005 relate the most recent data available (September 2005 for prices November 2005 for employment).
4. tcf is thousand cubic feet, and bbl is barrel

GRAPH 1: EMP. PROP. & PRICE INDICES



Employment Source: BLS, State Empl., Hours & Earnings, www.bls.gov.
Energy Price Source: Energy Information Administration,
US Department of Energy, www.eia.doe.gov.

economy equaled 2.8% and 4.8%, respectively. Additionally, Oklahoma's economy grew at a faster rate than the national economy in each of the years between 1977 and 1982 with annual average growth of 15.7% for Oklahoma's GSP compared to average annual growth of 10.1% for the nation's GDP.

Ultimately, the relative job opportunities available in Oklahoma compared to the rest of the nation also impacted the state's population growth during the Oil Boom. Between 1975 and 1982, Oklahoma's population grew 16.3%, which was more than double the national population growth rate of 7.3% over the same time frame.[5]

1982-1987: BUST YEARS

While the previous information related the positive results of the Oil Boom between 1975 and 1982, the Oil Bust, after energy commodity prices plummeted, also produced dramatic results as well.

Graph 1 relates energy commodity prices (as inflation-adjusted index values) and Mining sector employment proportions between 1975 & 1990. As it relates to commodity prices, real crude oil prices peaked in 1981 at 111.6% higher than in 1975, and real natural gas prices peaked in 1983 over 200% higher than in 1975. Likewise, the proportion of people employed in the state's Mining sector peaked in 1982 at 8.1% and has not been as high since then.

Between 1982 and 1987, natural gas prices declined 32.1% and crude oil prices declined 46.0%. These energy commodity price declines negatively affected Mining sector employment, which suffered a 55.3% employment loss, or 58,812 jobs, in the five years between 1982 and 1987. Mining sector employment continued its downward spiral until 1999 when it reached 28,724 jobs. The proportion of nonfarm jobs employed in the state's Mining sector decreased from 8.1% in 1982 to 4.0% in 1987, which was slightly less than the 1975 proportion.

Mirroring the state's lower Mining sector employment proportion between 1982 and 1987, the percentage of the state's GSP accounted for by the Mining sector also plummeted from 21.4% in 1982 to 9.2% in 1987. The share of the state's GSP continued to drop until 1995 when it reached 4.9% of the state's GSP.

Employment and production losses in the state's Mining sector negatively affected Oklahoma's nonfarm employment as well. In 1982 nonfarm employment peaked at 1,306,092 jobs, but by 1987 the state's nonfarm employment bottomed out at 1,204,612 jobs. Total employment losses to the state's economy equaled 101,480 jobs, a 7.8% decrease from 1982. In fact, Oklahoma's total nonfarm employment did not recover its 1982 employment level until 1992.

The poor performance of the state's economy adversely affected population growth as well as people left Oklahoma for better opportunities elsewhere. Between 1982 and 1990, Oklahoma population decreased 2.4% while the nation enjoyed a 7.2% population growth rate.[5]

2000-2005

Natural gas prices increased from $3.68/tcf in 2000 to $6.62/tcf in 2005 - a 79.9% increase. Similarly, crude oil prices increased 84.0% over the same time period. The experience that Oklahoma had during the Oil Bust is not one Oklahomans would like to repeat, which is the basis for some of the apprehensiveness with the recent increase in energy commodity prices.

5. Population estimates from the Oklahoma Department of Commerce - Research & Planning

There is one very important difference between the stimulus causing previous energy commodity price increases and the increases occurring more recently, and that difference is that the previous price spikes were caused by supply shocks while much of the recent increase is due to demand growth.

Between 1979 and 1982, geopolitical events led to energy supply shocks in the global economy. With steadily growing demand for energy resources, these supply shocks in turn caused rapid energy price inflation. The Iranian Revolution in 1979, and the Iran/Iraq war between 1980-1981 have been cited as causes for the supply shocks during this time period. After these factors limiting global production subsided and oil & gas supply was restored to the market, energy prices plummeted.

More recently, the energy commodity price increases have occurred at the same time that global energy production (supply) has been increasing. So rather than supply constraints, it is an increased global demand for energy commodities that has contributed to the steady price increases since 2000 (except of course for the supply shock caused by Hurricane Katrina's damage to refineries in late 2005). This higher demand for energy commodities is occurring as a result of economic growth not only in the United States, but also from the developing economies in China and India. This global economic growth and the increased energy demand to fuel this growth should provide less concern for a repeat of the Oil Bust for the state's economy.

Diversification

In addition to the underlying causes for the energy price increases being different, Oklahoma's economy has diversified its employment in the past fifteen years and the Mining sector does not account for as large a proportion in 2005 as it did in 1990.

Table 2 relates total nonfarm employment figures & proportions between 1990 and 2005. It should be noted that the basis for classifying industrial sectors changed in the late 1990's from the SIC system to the NAICS system. Because of this change, SIC data is not available after 2001 and NAICS data is not available before 1990. So in order to directly compare recent 2005 proportions with historical data, it is necessary to present the NAICS-based data.

As it relates to the Mining sector, Natural Resource & Mining employment decreased from 3.2% of the state's nonfarm employment in 1990 to 1.8% in 2000, and has

Table 2: Oklahoma Nonfarm Employment Proportions 1990-2005
(Employment in thousands)

	1990		1995		2000		2005	
Sector	Employment	Pctg.	Employment	Pctg.	Employment	Pctg.	Employment	Pctg.
Natural Resource & Mining	38.4	3.2%	30.4	2.3%	27.0	1.8%	32.2	2.2%
Construction	41.2	3.4%	50.3	3.8%	61.8	4.1%	63.1	4.2%
Manufacturing	156.6	13.1%	161.5	12.3%	177.5	11.9%	141.4	9.5%
Goods Producing Sectors	*236.2*	*19.8%*	*242.2*	*18.4%*	*266.3*	*17.9%*	*236.7*	*15.8%*
Trans., Util., & Trade	248.2	20.8%	265.7	20.2%	294.1	19.7%	277.1	18.5%
Information	22.9	1.9%	25.3	1.9%	35.6	2.4%	31.2	2.1%
Financial Activities	67.9	5.7%	73.6	5.6%	81.7	5.5%	85.8	5.7%
Professional Business Services	97.6	8.2%	121.9	9.3%	164.8	11.1%	167.0	11.2%
Educational & Health	113.3	9.5%	143.8	10.9%	163.0	10.9%	182.3	12.2%
Leisure & Hospitality	95.5	8.0%	113.6	8.6%	126.1	8.5%	129.8	8.7%
Other Services	52.0	4.3%	59.5	4.5%	70.1	4.7%	74.5	5.0%
Government	261.8	21.9%	269.6	20.5%	287.7	19.3%	310.5	20.8%
Service Producing Sectors	*959.5*	*80.2%*	*1,073.4*	*81.6%*	*1,223.1*	*82.1%*	*1,258.3*	*84.2%*
Total Nonfarn Employment	**1,195.8**	**100.0%**	**1,315.6**	**100.0%**	**1,489.4**	**100.0%**	**1,494.9**	**100.0%**

Source: Bureau of Labor Statistics, State Employment, Hours & Earnings, www.bls.gov.
Note: The 2005 Employment and Percentage data is an average of Jan. to Nov. 2005 data. Dec. 2005 data and annual estimates are not yet available.

since risen to 2.2% by 2005. Comparatively, the current US proportion equals 0.5%.

One drawback with the sector data is that the Natural Resources & Mining sector is a broad sector that contains industries not related to oil & gas activities, such as stone mining & quarrying, nonmetallic mineral mining, coal mining, etc. More specific industry data may be obtained from the Quarterly Census of Employment & Wage data released by the Oklahoma Employment Security Commission (OESC) and the Bureau of Labor Statistics (BLS).

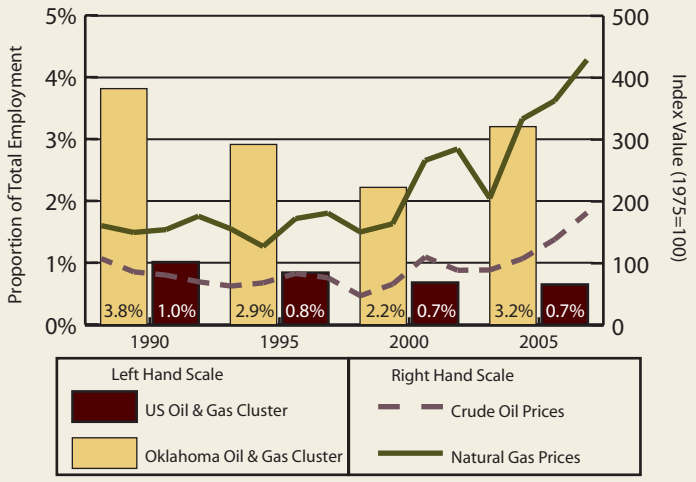
Oklahoma's "Oil & Gas Cluster Report" released last year, identified 14 specific industries relating directly to the extraction, distribution & processing of oil & gas commodities. The cluster also contains manufacturing industries that manufacture equipment used in the extraction and distribution of oil & gas as well as manufacturing industries that process oil & gas. Using these industry definitions, the Oil & Gas Cluster employs more people (46,072 jobs) than the Natural Resources & Mining sector (32,200 jobs), but the proportion of the cluster's employment (3.2%) still remains lower than the proportion of Mining sector employment (4.0% to 8.1%) at any point during the state's Oil Boom and Oil Bust period.

As can be seen from the accompanying graph, the proportion of people employed in the Oil & Gas cluster has fallen from 1990 to 2000. However, since 2000 as energy commodity prices have continued to increase, the proportion of people employed in the Oil & Gas cluster has increased in Oklahoma while remaining steady in the national economy.

In 1st Qtr 1990, Oklahoma's Oil & Gas Cluster employed 43,849 people and accounted for 3.8% of the state's total employment. Total employment in the national cluster equalled 1,089,846 people in 1990 and the cluster accounted for 1.0% of the nation's total employment.

By the 1st Qtr 2005, which is the most recent data available from the BLS for industry specific data, Oklahoma's Oil & Gas Cluster employed 46,072 people and accounted for 3.2% of total employment in the state. Comparatively, the US Oil & Gas Cluster employed 854,534 people and accounted for 0.7% the nation's total employment.

Graph 2: Emp. Prop. & Price Indices



Employment Source: OESC QCEW data
Energy Price Source: Energy Information Administration, US Department of Energy, www.eia.doe.gov.

Conclusion

Two factors reduce the possibility of experiencing a similar economic downturn as the state had experienced during the Oil Bust. The first factor relates to the underlying causes for the energy price increases between the two time periods. Supply shocks caused much of the energy price increases during the Oil Boom, and once the factors creating the supply shock have been addressed, prices can decrease rapidly. More recently, the price increases since 2000 are the result of global demand to fuel much of the economic growth since then.

The second factor is that Oklahoma's economy is not as reliant upon Mining sector employment or output as it had been during the Oil Boom. Even if prices were to plummet, the state's economy has diversified and the Mining sector no longer accounts for over 8% of employment or over 20% of the state's GSP. It is certain that employment in the Oil & Gas cluster would fall if prices were to plummet, but the impact upon the rest of the state's economy should not be as harsh as during the Oil Bust.

Contact Information

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