hen oil topped $100 a barrel in June 2014, analysts indicated prices would remain as hot as the summer sun.

And why not?

The high prices were the pinnacle of a boom that began in the mid-2000s with natural gas exploration and added oil to the mix following the Great Recession. People looking for jobs after the economic crisis flocked to energy-producing states, where new technology and techniques for extracting oil and natural gas had significantly increased exploration and drilling.

A month later, however, the situation was vastly different. High prices had edged down before plummeting for the rest of the year. By January 2015, oil prices were off 50 percent and the industry reduced operations. And while rig counts were down 49 percent by the end of April 2015 from the previous year, the industry still managed to ramp up production in 2015, thanks to increased efficiencies and cost cutting.

Jason P. Brown, a senior economist with the Federal Reserve Bank of Kansas City, explained in his recent research that analysts remain uncertain about when or if oil prices will stabilize and trend upward. Economists expect this uncertainty to affect employment in energy-producing states. The effects, however, may vary by state, and may not have the same impact as in past booms and busts.

Falling prices

Rapid declines in oil prices are nothing new. From 1981 to 2009, crude oil prices dropped sharply six times. Chad Wilkerson, an economist and Oklahoma City Branch executive with the Kansas City Fed, analyzed those six downturns and found the decline of 1985-86 was most similar to the current drop in prices.

In 1985-86, real oil prices fell more than 50 percent, rigs declined 60 percent and the United States was not in a recession—all similar to 2014-15. In past declines, the Organization of Petroleum Exporting Countries (OPEC) often cut production to boost prices, such as in 1985, when it cut production 75 percent. Yet when prices continued to decline in 1986, Saudi Arabia abandoned the strategy and increased production. The increase in supply sent oil down to $20 a barrel and spurred a further decline in the number of rigs.

Amid the recent price decline, OPEC said it would not cut production. Brown said OPEC may have wanted to protect its market share of global oil sales because U.S. producers had increased the supply of oil. OPEC’s unwillingness to curb production shocked oil prices further and West Texas Intermediate (WTI) futures prices declined nearly 20 percent in both December 2014 and January 2015. Futures prices averaged about $49 a barrel through March 2015, with significant reduction in rig activity, Brown said.
The effect on energy producing states

Brown said when energy prices fluctuate, oil- and gas-producing states face different outcomes than the rest of the nation, which can lead to regional recessions in those states.

Those states now are less vulnerable than in past declines—relying less on the oil and gas sector for revenue and thus avoiding economic pitfalls. For example, in 1982, the average share of economic output from oil and gas extraction in energy-producing states was 17 percent. The share was higher for Wyoming and Louisiana—35 percent—compared to 4 percent for the rest of the United States.

Mark Zaback, president and CEO of Jonah Bank of Wyoming, moved to the Cowboy State in 1982, about the time domestic production and prices began to decline. The resulting economic turmoil surprised the young banker, who had worked mainly with the agricultural industry in Nebraska.

“It took (Wyoming’s) economy 15 years to recover,” he said.

Many businesses and banks had money tied up in the energy sector and when prices continued to dive many people lost their jobs; companies and financial institutions either closed or suffered losses.

“I had customers who robbed their children’s savings just to make payroll,” Zaback said.

Many of the businesses, and individuals, who survived those lean years, including the government of Wyoming, learned from their mistakes.

“We’re much more diversified than we were back then,” Zaback said.

As oil and gas production declined in the late 1990s, the sector was just 3 percent of total output in energy-producing states. By 2012,
Decline in U.S. energy production affects import and export trades

A decline in U.S. energy production could affect the recent decline in the country’s net-energy imports.

Craig S. Hakkio, a senior vice president and special advisor on economic policy, and Jun Nie, a senior economist, both with the Federal Reserve Bank of Kansas City, recently looked at the effects lower oil prices have had on energy production and imports.

Since 2005, horizontal drilling and hydraulic fracturing, or fracking, have changed U.S. energy production. After years of decline, U.S. energy production—crude oil, natural gas and natural gas liquids—has increased equal to peak productions set in the early 1970s.

Hakkio and Nie explained that from the early 1950s through 2005, U.S. consumption of crude oil, natural gas liquids and natural gas grew while production declined, leading to a significant increase in net imports. The trend reversed after 2006, they said; consumption was flat while production increased, leading to a decline in imports.

U.S. energy exports are a different matter. The Energy Policy and Conservation Act of 1975 banned the export of most crude oil in an attempt to insulate the United States from worldwide price shocks. If this ban is lifted, the economists say, the recent increase in production will have a large effect on U.S. exports overall.

Hakkio and Nie’s forecast, however, assumes that energy production will decline by 4 percent this year, and imports will increase slightly due to the decrease in oil prices. Non-energy imports also will grow by 5.9 percent, the economists say, with overall import growth at 5.5 percent. This is above the average pace of 4.8 percent per year from 2010 to 2013.

Their forecast suggests that energy exports will increase 6.3 percent in 2015. This is significantly lower than the average pace of 20.7 percent from 2010 to 2013, reflecting the large effect an expected decline in energy production on energy exports. Non-energy exports are expected to increase 1.7 percent in 2015, which is much lower than the 2010-13 pace of 5.3 percent. Their forecast projects that total growth in exports in 2015 will be 1.9 percent, significantly below the 2010-13 average pace of 5.8 percent.

They also expect the overall trade deficit to increase to $573 billion by the end of 2015, about 21 percent higher than its level at the end of 2014.
Inc., filed for bankruptcy protection Aug. 3 and one of its top executives resigned. The Virginia-based firm employs almost 8,000 people.

“We’ve been going so fast for so long, some of this correction (in prices) helps companies to slow down and re-evaluate,” Zaback said. “Sometimes it’s a good thing, as long as it doesn’t last too long.”

Employment in the oil sector

The unknown is how long is too long? Analysts are uncertain about how long prices will remain low and what lasting effect this reduction will have on U.S. energy companies and state and national economies.

Brown explains that employment in the oil and gas industry happens in phases. Phase one, the exploration phase, involves teams of geologists, geophysicists and engineers who examine prospective drillings sites. Procurement specialists negotiate leases with mineral owners, who receive royalties if oil and gas are extracted from their properties.

Phase two involves initial drilling, confirming earlier estimates of the amount of oil and gas that can be extracted profitably from the area. Teams from the first phase evaluate samples and information collected from the mineral reservoir to help the company decide whether an oil or gas field can be developed.

The third phase, the development phase, is dependent on the success of phase two and produces the most jobs. The development phase also can affect businesses outside the oil and gas sector. Drilling rigs are established, roads for the fields are built, pipeline is laid, and other infrastructure is developed to make the field accessible and productive. According to Brown’s research, an increase in one rig adds 28 jobs in the same month, 94 jobs after six months and 171 jobs in the long run.

The fourth phase deals with production. Rig operators extract oil or gas from fields and companies see the first revenues from product sales. Production can last a few years or several decades, depending on field’s size and its costs of operation and production. Fewer workers are employed in this stage and most employment remains in the energy sector.

MARK ZABACK, president and CEO of Jonah Bank of Wyoming, has experienced the effects fluctuating energy prices can have on a state’s economy.
“Oil and gas extraction directly increases employment and the income of those working in the industry, particularly during exploration and drilling but also during production,” Brown said. “Expenditures on constructing and operating oil and gas wells may also indirectly increase demand for other goods and services such as gravel, water, concrete, vehicles, fuel, hardware, consumables, food services and housing.”

These expenditures lead to other industries producing or selling needed goods and services in an area with large-scale development and increasing employment to meet demand.

Employment during the third and fourth phases, however, is directly affected when oil prices drop. A timely and frequent measure of employment is rig counts. In the current downturn, rig counts began to fall in September 2014. The states with the largest rig counts—Texas, North Dakota and Oklahoma—had the largest predicted reduction in employment. Brown says Texas could see 82,000 fewer jobs, with losses of 17,000 in North Dakota and 16,000 in Oklahoma.

Although states with more rigs have the largest employment losses, energy states without a diversified economy feel the effects of employment loss more sharply, Brown said.

A further decline in rig counts may occur in the second half of 2015 before leveling off, Brown said. So far, oil and gas rigs combined in the United States have declined nearly 50 percent from when the oil boom reached its pinnacle. The decline in rig counts and sector employment, however, is only part of the picture.

**U.S. oil production continues to climb**

Despite low oil prices and market saturation, several U.S. oil firms have increased their production targets for 2015. The U.S. Energy Information Administration (EIA) said several companies have increased production and reduced costs; however, EIA doesn’t expect these companies will be able to maintain production levels.

“While some U.S. producers of light tight oil might be successful in lifting output in the short-run, we expect the majority will struggle to sustain higher rates over longer periods due to steep spending curbs,” the agency said in a mid-year report.

According to the EIA, the United States produced 9.1 million barrels of crude oil a day in January. By early July, EIA estimated output had swelled to 9.6 million; the estimate in early August was 9.4 million.

Given the glut of oil in the marketplace, most analysts don’t expect U.S. producers to keep up the pace, and expect a decline in production in the second half of 2015. Whether the reduction results in further job loss remains to be seen.

“If the oil and gas sector continues to become more capital intensive, total employment in energy-producing states may be less responsive to future changes in oil and gas activity depending upon the relative size of the sector in each state,” Brown said.

**Further Resources**


**Comments/Questions** are welcome and should be sent to teneditors@kc.frb.org.