What Is Driving Oil Prices?

By Richard G. Anderson and Jason J. Buol

During the second half of 2004, the futures and spot prices of oil reached record levels in today's dollars, not adjusted for the effects of inflation. Because of its importance, economists are again seeking to better understand the factors that influence the price of oil. To what extent are higher prices the result of supply vs. demand factors? How much has speculation affected oil prices?

As news reports often say, oil prices are "notoriously volatile." The figure on the next page plots the spot and futures price for West Texas Intermediate oil from 1994 through 2008.[1] During this period, the spot price ranged from a low of just above $10 in the late 1990s to the high of over $50 seen in October 2004. The change in futures prices has been just as dramatic. In November 2003, the futures market expected prices to be approximately $27 by December 2004, as indicated by the figure. It is important to note that these expectations had, in part, factored in the ongoing conflict in Iraq, which began in 2003. In November 2004, however, the futures market predicted oil prices of approximately $48 by December 2004 and remaining around $40 through 2008. Such an increase in the futures price suggests that the recent spot price increase is not viewed as a purely temporary shock.[2]

Demand

Many factors affect the price of oil in the world market. Recently, the rapid increase in world oil demand has been a major factor. In August 2004, the International Energy Agency reported that world oil demand was increasing faster than at any other point in the past 16 years.[3] The agency attributes the increase in demand to rapid economic expansion in several countries, particularly China.

In 2003, China became the second-largest consumer of petroleum products behind the United States.[4] According to the U.S. Energy Information Administration (EIA), China accounts for approximately 40 percent of world oil demand growth over the past four years and consumes approximately 5.56 million barrels of oil per day (bbl/d).[5] The EIA forecasts continued growth in oil demand by China, reaching 12.8 million bbl/d by 2025, with net imports of 9.4 million bbl/d. This would mean China's oil demand would more than double in the next 20 years.

India also has fueled increased oil demand. In 1995, India's oil consumption was approximately 1.6 million bbl/d. The EIA predicts that India's future consumption will grow rapidly from 2.2 million bbl/d in 2003 to 2.8 million bbl/d by 2010. This would represent a 75 percent increase in 15 years. India's net oil imports are also increasing. Since 2000, India's net oil imports increased by 27 percent, from 1.1 million bbl/d to 1.4 million bbl/d in 2003. As other developing countries continue to expand, they are likely to follow the same pattern of sharply rising demand for energy.

Supply

Meanwhile, several oil-producing countries have undergone turmoil that has affected their abilities to produce at full capacity. Two such countries are Iraq and Venezuela.[6]

A country with obvious supply issues is Iraq. Since the start of the second Iraq war, Iraq's oil production has been uncertain at best. The most obvious reason is the continued violence and sabotage of facilities. But other factors are also critical. The EIA reports that during Saddam Hussein's regime, Iraq used several short-term techniques to increase oil production that are not considered acceptable in the oil industry. Oil experts with the United Nations have reported that damage to some reserves in southern Iraq is so severe that recovery rates may be significantly lower than normal. These experts also predict that the long-term sustainable production rate has been reduced. This means that Iraq may not be able to produce the amount of oil that was once thought possible with current technology.[7] The problems in Iraq are two-fold: getting production back up to pre-war levels and maintaining, if not increasing, those levels.

Another oil country with political turmoil is Venezuela. Political problems were exacerbated by a nationwide strike in December 2002. The strike led to significant reductions in the country's GDP and oil production. The EIA reports that Venezuela produced 2.6 million bbl/d in 2003, a 10 percent decrease from 2002. The strike, which lasted until early 2003, significantly reduced total oil production. Since that time, production has been returning to levels seen before the strike; however, there are still reasons to doubt the country's progress. In August 2004, President Hugo Chavez survived a recall vote to remove him from power, and there is no guarantee this will be the only attempt. Such uncertainty has led some to question the ability of Venezuela to continue to produce a steady flow of oil.

Speculation

In August 2004, Acting OPEC Secretary General Maizar Rahman estimated that speculation was adding between $10 and $15 to the oil price. In addition, the Aug. 21, 2004, issue of the *Financial Times* published an article that estimated that oil speculation was accounting for up to $10 of the current oil prices.

Federal Reserve Chairman Alan Greenspan also has asserted that speculation might be a factor in oil prices. In his September 2004 testimony before the House Budget Committee, Greenspan identified two sources contributing to high oil prices.[8] One was a "pronounced increase in demand to hold inventory," and another was "investors and speculators who took on larger net long positions in crude oil futures."

To test Greenspan's assertions, we turned to the U.S. Energy Information Administration's September 2004 Short-Term Energy Outlook. This report shows commercial oil stocks for Organization for Economic Cooperation and Development countries beginning in January 2002 and projects oil stocks to November 2005. If the report offers an indication of future oil inventories, oil stocks would increase if Greenspan's assertion were correct. However, the report does not show such an increase. In fact, the report states that oil inventories in both the United States and other industrialized countries were below normal and projects that oil stocks will be in decline from September 2004 to approximately March 2005. If oil inventories were considered to be below normal and the demand to hold oil inventory were "pronounced," one would expect to see an increase in oil stocks in the coming months. The EIA report suggests that this is not the case.[9]

The second source of higher prices suggested in Greenspan's testimony was speculators influencing prices by taking larger positions in crude oil futures. This would suggest that more active trading was taking place before and during the time period when oil prices were reaching record nominal levels. A cursory examination of petroleum futures volume data from the *Wall Street Journal* indicates that the volume of trades was up during this time period, suggesting that enhanced speculation did contribute to the increase in oil prices.

Other Factors

Because oil prices are so volatile, pinpointing only one or two factors that cause the price to change provides an incomplete picture of the situation. Besides market speculation and the traditional supply and demand factors, other variables also influence the price of oil. For example, the series of hurricanes experienced in Florida and other Southern states disrupted the flow of oil into the United States and damaged oil facilities. There is also the sporadic shutdown of oil refineries for maintenance, regulatory changes and other reasons. Although all of these variables can affect oil prices, as hurricane damage is repaired and oil refineries are reopened, these variables probably will have only a short-term impact. Significant changes in oil supply and demand behavior, however, would affect the price of oil for some time to come.

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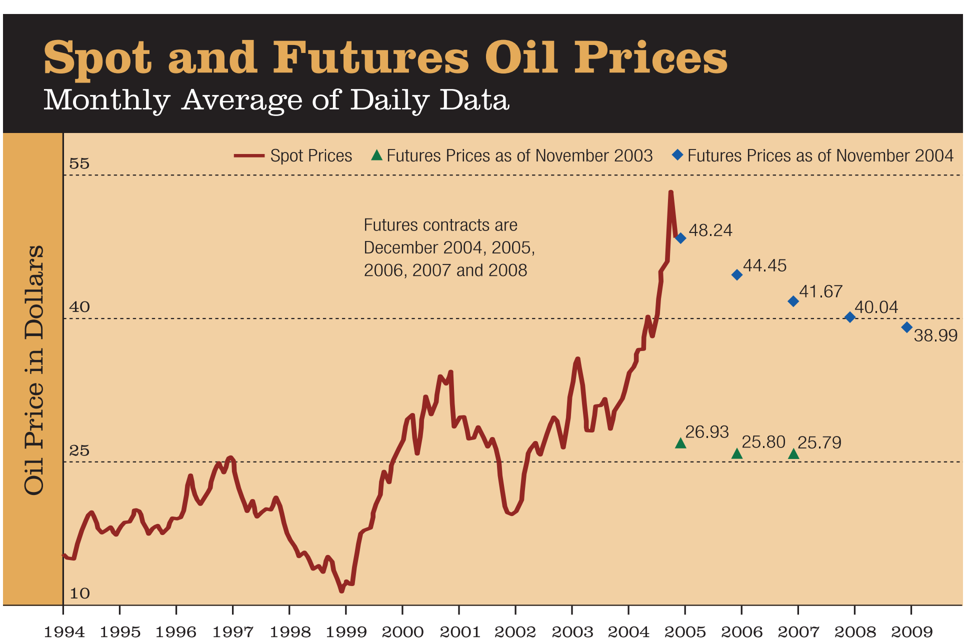

SOURCE: Haver Analytics and *Wall Street Journal.* Data as of Dec. 3, 2004.

ENDNOTES

1. West Texas Intermediate is a domestically produced light, sweet crude oil. Since light, sweet crude is the most actively traded oil contract, it is commonly used as a pricing benchmark. For more information, visit the New York Mercantile Exchange at www.nymex.com.
2. See Gramlich (2004) and Bernanke (2004).
3. See the International Energy Agency's Oil Market Report for 2004.
4. In 2003, the United States consumed approximately 20 million barrels per day.
5. See these and other country summaries at the U.S. Energy Information Administration's Country Analysis Briefs.
6. Other countries include the former Soviet Union and Nigeria.
7. See U.S. Energy Information Administration's Iraq Analysis Brief.
8. See Greenspan (2004).
9. In other words, the changes in oil demand and supply for consumption purposes discussed earlier have played a much larger role in oil price increases relative to heightened demand to hold inventory.

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