

## Making Sense of High Oil Prices

Stephen P. A. Brown, the Dallas Fed's director of energy economics, discusses the forces behind the recent surge in oil prices, the prospects for alternative fuels and the economic fallout from increasingly expensive energy.

**Q: What's behind the rapid rise of oil prices?**

**A:** First and foremost, it's a demand-driven price spiral. We've had strong economic growth in the U.S., while China, India and other rapidly developing nations have greatly increased their consumption. When added to existing needs in Europe, Asia and elsewhere, global demand has outstripped any gains in production and reduced excess capacity to near zero.

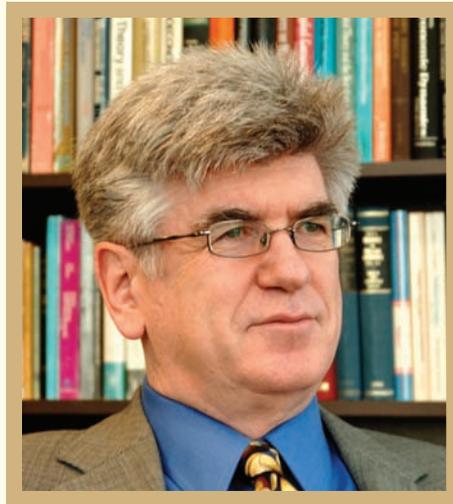
Other factors are important. Troubles in such oil-producing countries as Nigeria, Venezuela, Iraq and Iran have spurred fears of supply disruptions. The dollar has been depreciating, which means we've seen higher real price increases than Europe or Asia. The demand for oil is very inelastic, so small increments of market tightening lead to strong price movements.

The result has been a doubling of oil prices in the past few years. The weekly benchmark price for a barrel of West Texas Intermediate rose from \$32.20 at the end of 2003 to \$42.56 at the end of 2004 and to \$59.49 at the end of 2005. In early July, oil topped \$75 a barrel—an all-time high in current dollars. If we adjust for inflation, oil would have to reach \$96 a barrel to match the record set in April 1980.

**Q: Do we face a future of high and rising oil prices?**

**A:** It depends on who you ask. One group contends oil production is at or near its peak, and prices will just continue to rise with global demand. We hear this argument from oil industry veteran T. Boone Pickens and Matthew Simmons, author of *Twilight in the Desert: The Coming Saudi Oil Shock and the World Economy*.

Not everyone is so bleak. The U.S. Energy Information Administration, the



International Energy Agency and Daniel Yergin's Cambridge Energy Research Associates all see sufficient oil resources for generations to come. They expect new supplies to flow onto world markets in the next few years, knocking prices down to the \$35 to \$45 range.

Between these two extremes lies the view expressed by New York University economist Dermot Gately and others—that resources are indeed abundant, but impediments to exploration and delivery will keep prices elevated. This view is consistent with the readings in the futures market, which show oil prices remaining high through the rest of the decade. We can expect ups and downs along the way. The options market reveals considerable uncertainty about oil prices over the next few years.

**Q: Are higher oil prices the main factor pushing up gasoline prices?**

**A:** For the most part, yes, but today's retail gasoline price is about 25 cents higher than would be suggested on the basis of crude oil prices. The difference comes partly from a

shift to ethanol as the summer oxygenate and partly from the fact that gasoline prices rise more quickly when oil prices rise than they fall when oil prices decline.

**Q: Are industry profits and mergers driving oil prices?**

**A:** No. World oil markets are dominated by producing countries—not the oil companies. The big profits aren't unexpected. Anytime a company sees rapid increases in the price of what it sells, it's going to do well. When these companies were producing crude oil for \$20 a barrel, they weren't making nearly as much money. If we punish their recent success, they'll have less money and less incentive to invest, and in the end we'll get less oil.

No empirical evidence links mergers to the jump in oil prices. In fact, many of the mergers occurred before the latest spike in prices—at a time when the industry was downsizing and consolidating. Some evidence suggests, however, that mergers may have had a small effect on retail gasoline prices in cities where consumers now have access to fewer brands of gasoline.

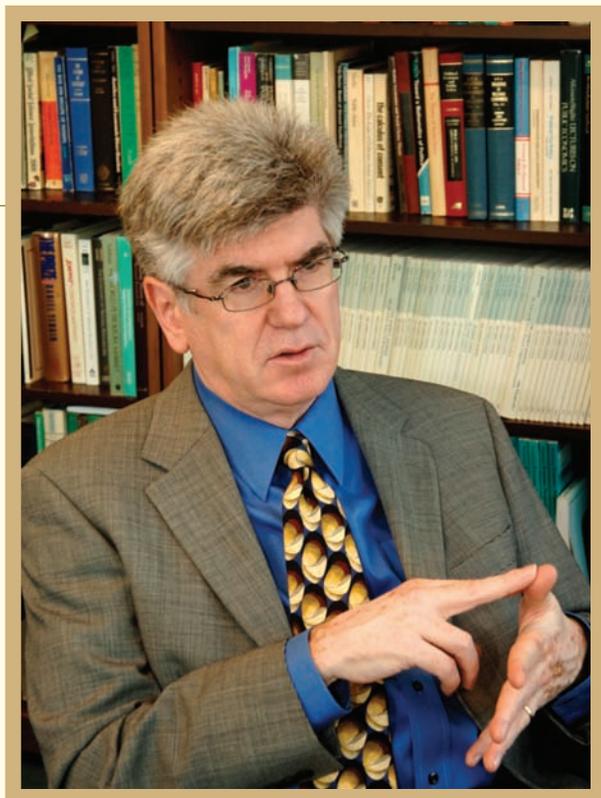
**Q: What are the prospects for increasing supplies of oil?**

**A:** Extensive exploration and development are taking place in the U.S. and abroad, so it seems likely that new oil supplies will come on line in the next few years. The primary limitation isn't money. The companies face shortages of the equipment and personnel required to increase drilling.

Although oil producers are responding to higher prices, the gains in supply are likely to prove modest because reserves are concentrated in countries where incentives to increase output aren't strong. These are places where the government controls the oil industry or where a lack of economic freedom stifles the private sector.

Two-thirds of the oil is in Saudi Arabia, Iran, Kuwait, the United Arab Emirates and other countries with heavy government

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direction of the oil industry. Only 15 percent of reserves are in nations with high scores in economic freedom and market-driven oil production—chief among them, the United States and Canada.

The best prospect in these two countries lies in unconventional sources of supply. One is oil sands, which can be used to produce oil profitably at prices as low as \$35 a barrel. Canada has huge deposits in Alberta. The exploitation of oil sands is being increased, but not fast enough to ease the market.

Experts expect shale oil can be profitably developed at prices as low as \$50 a barrel, and these deposits are thought to be plentiful in the U.S. The shale oil projects are still consigned to the oil companies' advanced technology groups, rather than their exploration and production divisions. Given how recently oil prices were below \$50 a barrel and uncertainty about future prices, it's not clear when oil companies will shift from shale-oil research to shale-oil production.

**Q: What about developing alternatives to oil—such as hydrogen or ethanol and other biofuels?**

**A:** With today's technologies, hydrogen is more like a battery that stores energy than an energy source. We have to use oil, natural

gas or electricity to produce hydrogen.

If we use oil or natural gas, we would be using fuels that are already portable to obtain hydrogen and incurring an energy loss to do so. In the case of electricity, which isn't portable, the energy use would be massive—on the order of 15 times more than we'd get back from the hydrogen. Hydrogen does have the advantage of being a clean fuel.

With current technologies, biofuels are still fairly expensive. Ethanol also has problems when used in high concentrations. Biodiesel is attractive at current prices but limited in quantity.

**Q: What about the benefits of changes to improve fuel efficiency?**

**A:** Three-quarters of the oil we use goes for transportation—so fuel efficiency can make a big difference. Today's gasoline prices are encouraging people to drive less and buy more efficient cars and trucks. It takes time to turn over the fleet of vehicles, and the automobile manufacturers have to gear up to change their production mix.

**Q: How are high energy prices affecting the economy?**

**A:** Growth is slower. Inflation and interest rates are higher. I estimate that the tripling of oil prices since 2002 has reduced GDP by 2.4 to 3.2 percent, spread out over a number of years. Most of the losses are behind us now, so the losses through the end of 2007 will likely be about half a percentage point a year.

In magnitude, the inflationary ripples are on par with the decline in GDP. The lags, however, are longer. The price increases are slower to be realized and take longer to run their course. The price effects of the oil spike

are what we're dealing with now.

With higher energy prices, the near-term loss in income is greater than the longer-term loss. As a result, consumers try to smooth their consumption over time, either through borrowing or reducing savings. Either way, interest rates are likely to be pushed upward.

**Q: Why has the impact been relatively mild?**

**A:** Unlike the sudden shocks of the OPEC oil embargoes of the 1970s, recent rises in oil prices have been driven by growing demand rather than sharply reduced supply. The result has been a more gradual increase in prices that has given the economy more time to adjust.

Over the past 20 to 30 years, we've become much more efficient in our energy use. In 1980, it took twice as much energy to produce \$1 of inflation-adjusted GDP as it does today. As a result, each dollar increase in oil prices has less impact. It also helps that we've experienced oil price shocks in the past. Firms have learned how others in their supply chains will respond.

Of course, the GDP loss can't be eliminated completely. High energy prices are the result of energy becoming scarcer. When energy supplies are tighter, it reduces the output we get from given quantities of labor and capital.

