

A Conversation with Michael Plante

Increased U.S. Energy Supply Helps Offset Tight Global Conditions

As world crude oil prices remain persistently elevated, along with those for many other commodities, Dallas Fed research economist Michael Plante explores the reasons why and the prospects for lower costs, including those at the pump. He offers a cautionary note about U.S. advances toward energy independence and the era of inexpensive natural gas.

Q. Amid disappointing U.S. economic growth, the European recession and slowing in emerging markets, oil prices seem high. Why? What's the outlook for 2013?

Although economic growth in many industrialized countries has been lackluster in recent years, the world economy has grown and global oil consumption has slowly, but surely increased. The world consumed about 1 percent more oil in 2011 than in 2010, and demand is expected to expand by just less than 1 percent this year.

Meanwhile, supply has struggled to keep pace with demand. Unexpected supply disruptions are partly to blame. Libya went offline in 2011 during its revolution, and in 2012, there have been problems in Syria, South Sudan and the North Sea. Moreover, apart from Canada and the U.S., non-OPEC output growth has been poor.

World supply in 2011 rose just 0.3 percent from 2010 levels, an increase insufficient to keep up with demand. The situation improved this year, with supply climbing more than 2 percent. That has been just enough to keep pace with demand growth. So, upward pressure on oil prices hasn't been surprising. Crude oil averaged \$80 per barrel in 2010, \$111 in 2011 and is expected to average \$112 this year.

The world economy is likely to continue growing at a subdued pace next year, as is demand for oil. The Energy

Information Administration (EIA) is currently penciling in about a 1 percent consumption increase for 2013. Supply is expected to expand by about 1.1 percent, and this should help ease pressure in the market. The EIA predicts Brent crude oil prices will average about \$103 a barrel, a modest decline from 2012.

Q. Prices for other commodities, such as corn and soybeans, are near record highs too. Is there anything they share with oil markets?

These commodities and crude oil have all benefitted from burgeoning demand over the past decade or so. Much of it reflects economic growth in the developing world, especially China. For example, China's soybean consumption roughly tripled from 2000 to the present and now accounts for about 30 percent of world consumption, up from 15 percent in 2000. If you look at the data for corn, China consumes almost 70 percent more than it did in 2000. The country, which had been a corn exporter, became a net importer in 2009. Meanwhile, China's crude oil consumption has doubled since 2000.

As with oil, rapid growth in demand for other commodities has created a situation where any supply problems prompt rapid price increases; for example, poor U.S. harvests in 2010 and 2012 caused corn and soybean prices to spike.

Q. There are different types of oil, and they command different prices. It used to be that the price of West Texas Intermediate (WTI) and North Sea Brent crude were roughly in line. Why isn't that true anymore?

Crude oil varies from place to place and thus sells for different prices. Brent and WTI, both light sweet crude, should sell for roughly the same amount. Since early 2011, however, WTI has been much cheaper than Brent crude. WTI has sold for about \$20 less than Brent crude in recent months.

This reflects a crude-oil production boom in Canada, North Dakota and parts of Texas that has flooded the Midwest and midcontinent markets. This has led to a bottleneck in Cushing, Okla., a key distribution hub. Crude oil is usually shipped by pipeline, but there is just not enough capacity to move it to other parts of the U.S. or Canada where it could fetch higher prices.

Given the price disparity and the lack of pipelines, people have shipped crude by truck, rail and barge to get it to areas where it will sell for higher prices. Refineries in the Midwest and the Rocky Mountain regions have taken advantage of the disparity by running at full capacity. These refiners can sell gasoline at world prices but pay significantly lower input costs than competitors elsewhere.

Pipelines are eventually going to be built that will deal with this situation. Once that happens, Brent and WTI prices will converge.

Q. You note that U.S. oil production has increased after many years of decline. Have oil imports declined as a result? Is North American energy independence a realistic and desirable goal?

New technology has led to surging U.S. production since 2009, reversing a decline that began in the mid-1980s. As a result, crude oil imports have declined for the past several years. Imports are expected to continue falling in the near future as production grows.

If "energy independence" means that the U.S. produces all of the crude



oil that it consumes, then that seems unlikely in the foreseeable future. The EIA predicts that net imports of oil products should level out to below 40 percent of total consumption after 2020. Even under the most optimistic assumptions, net imports still remain above 20 percent of total consumption in the long run.

Producing more oil when it makes business sense is a good thing. But when it comes to oil, energy independence for energy independence's sake is probably not as desirable as one might expect. For example, energy independence in crude oil would not protect the U.S. from price spikes in the oil market even when caused by events outside the U.S. Crude oil and oil products trade on a world market. So U.S. consumers and firms would continue paying the same price as everyone else. Independence would only have a particular benefit in some sort of catastrophic situation where the U.S. literally could not purchase crude oil on the world market. However, that seems unlikely, and even then we have the strategic petroleum reserve to deal with such a supply disruption.

Q. What are the costs that feed into gasoline prices at the pump? Are high oil prices the reason we are seeing near-record gasoline prices? Why do these prices vary across states?

Crude oil made up about 68 percent of the retail price of gasoline in 2011, EIA data show. Federal and state taxes contributed about 11 percent to the final price, while another 11 percent was

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due to the cost of refining the oil into gasoline. Finally, about 9 percent went to distribution costs through retail outlets.

While these percentages can change over time, the cost of crude oil is always the largest component behind U.S. retail prices. Thus, if oil prices are high, gasoline prices will also be high; if they are low, then gasoline will be less expensive.

Retail prices vary significantly between countries and across different parts of the U.S. This is generally due to differences in taxes and distribution costs. For example, European retail prices for gasoline are often much higher than those in the U.S. because of higher taxes. In the U.S., prices tend to be lower on the Gulf Coast than in many other parts of the country since a lot of gasoline is produced on the coast and distribution costs are therefore lower.

Gasoline prices can also vary due to environmental considerations. California, reflecting air pollution concerns, mandates strict regulations regarding gasoline formulations. California gasoline is produced in limited quantities and is thus relatively more expensive. Not surprisingly, prices tend to be higher in California than elsewhere in the U.S.

Q. Most commodity prices are at high levels, but natural gas is low. Why? If U.S. natural gas production is expanding, can that excess capacity be exported or used in some other way, such as for powering motor vehicles?

The supply of natural gas in North America has rapidly grown in recent years because of the shale-gas revolution, which has driven down gas prices to very low levels in the U.S. On the other hand, natural gas remains fairly expensive elsewhere in the world.

While many commodities can be easily shipped from one location to another, this is not true for natural gas in the U.S. That helps explain why prices can be low here but higher elsewhere.

Of course, once prices diverge between markets, there will be a natural tendency for someone to figure out how to make money off of the difference. One possibility would be exporting U.S. natural gas as liquid natural gas (LNG) to other countries. However, this is a costly and time-consuming process to get started. Another is to use the natural gas domestically to produce other goods that can then be exported. Petrochemicals are a good example of this. An additional possibility is increasing domestic demand to absorb surplus supply—for example, in power plants generating electricity or as fuel for natural gas vehicles.

Q. With rising natural gas supplies increasingly contributing to the production of electricity, what is happening to coal? What are U.S. coal producers doing with their supplies?

U.S. power plants took advantage of collapsing natural gas prices earlier this year by increasing gas use at the expense of coal. As a result, coal producers were forced to look elsewhere for possible buyers. This contributed to sharply declining prices for steam coal, the type used to produce power.

U.S. coal exports are predicted to break records in 2012, paced by increased exports of steam coal to Europe. While natural gas is cheap compared to coal in the U.S., it is relatively pricier than coal in Europe. This has led some European power plants to produce more electricity using coal, some of it from the U.S., instead of from natural gas.