



## Oil and Stagflation

By John H. Makin

I am not an expert on the price of oil. But many who claim to be have been saying for months that its price should drop back below \$25 or \$30 per barrel. Meanwhile, the actual price has risen steadily to nearly \$50 per barrel as this *Outlook* goes to press.

At this level (nearly double last year's price), oil has become a major factor in the outlook for the global economy—too important to be left to the experts. With some help from knowledgeable people in the business of producing oil, I have tried to determine why the price keeps rising, where it is likely to go in the future, and what the consequences will be for growth and inflation in the United States and elsewhere.

As with most major economic trends over the past decade, the Federal Reserve and, yes, China have played a large role in boosting the price of oil. Suffice it to say, for now, that markets are searching for a combination of the price of oil and the fed funds rate that will constrain oil usage to the level of available oil supply. For both the oil price and the fed funds rate, the market-clearing price is above the current level. The higher the fed funds rate goes, the less high the oil price will go, and conversely. Both are mechanisms for slowing growth.

### The Oil Market

In 1970, before oil shocks, OPEC, gas lines, and stagflation entered common parlance, oil cost \$1.80 a barrel. Two years later, after some experimentation by Colonel Mohamar Qadhafi with withholding oil from the market and with some

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help from a very accommodative Fed policy in the run-up to the 1972 election, the price of oil had risen to about \$2.25 a barrel. Then came the Yom Kippur War in 1973, and in 1974 an embargo on oil exports to the United States by Arab oil exporters boosted the average price to \$11.58 per barrel—about \$43.40 in today's terms. Prices remained high during most of the seventies as central banks, after initial frightening experiments with tightening monetary policy to constrain oil price increases, essentially decided to validate most of the higher oil prices. With the onset of the Iran-Iraq War, prices rose above \$35 a barrel—equivalent to \$80 a barrel in current dollars.

By 1979, the upward pressure on U.S. prices from more costly energy and accommodation by the Fed in the form of negative real interest rates boosted U.S. inflation to double-digit levels. In October 1979, the then-new Federal Reserve chairman Paul Volcker stepped in to cap inflation by allowing short-term interest rates to rise above 20 percent, driving the economy into a sharp recession. Oil prices stabilized at around \$30 a barrel, inflation plummeted, and the economy started to recover in the summer of 1982. Stock and bond markets began long-term rallies. In the case of the stock market, the rally lasted until March 2000. For bonds, ten-year notes reached a low yield of about 3.1 percent in the spring of 2003 and have since risen by about 125 to 150 basis points as the U.S. deflation threat has passed and the Fed has started to raise interest rates.

After the sharp rise in oil prices during the 1970s and the sustained high price for the first half of the 1980s, the infrastructure for taking oil out of the

ground to refineries and for refining oil was increased substantially. The price of oil fell sharply, to below \$20 per barrel in 1986. Oil prices remained relatively stable below \$20 a barrel until 1998 when they dropped to \$12 a barrel during the Asian crisis. The only exception between 1986 and 1998 to quiet oil markets was the spike to nearly \$40 a barrel during the supply interruption attendant upon the Iraqi invasion of Kuwait. It may be that the 1990 oil shock associated with the first Iraq War conditioned market participants to expect reversible upward price spikes in the oil market instead of sustained upward moves. And, away from the spikes, the real price of oil, as measured in constant current dollars, kept falling after 1980.

### Supply Shocks and Demand Growth

The oil market has typically been characterized by supply shocks or, more specifically, by a sharp elevation in the fear of interrupted flows in oil supply. Events such as the first Iraq conflict may actually produce some interruption in flow, but they also induce a desire on the part of oil users to top off their tanks. Uncertainty about the supply of oil leads refiners and end-users of oil to wish to store as much oil as possible. A desire to add to stocks of stored oil boosts the price sharply. However, once oil inventories have reached capacity levels, the flow demand for oil reverts to a level consistent with underlying usage. The price drops sharply. If, as in the case of the first Iraq War, the conflict ends abruptly, as it did in January 1991, the precautionary demand for oil drops as well and the price falls even further. By early 1991, the price of oil was back below \$20 a barrel, where it had been before Iraq invaded Kuwait.

The run-up in the price of oil since 2000 from the low of \$13 to \$14 a barrel to today's price close to \$50 a barrel has been characterized by many as a supply shock, especially since the price increase in anticipation of and the execution of the war in Iraq. While oil has continued to flow from the Middle East, uncertainty about the course of the war and the reliability of that flow, exacerbated by uncertainties in Russia and Venezuela, have resulted in a desire to build oil inventories. The expectation was that with inventories built-up close to maximum levels by late last year, a return to lower flow demand for oil would keep the price in the \$25 to \$30 a barrel range.

Something fundamentally different, however, has been occurring in the global market for oil since 1998. First, China has experienced a growth boom that has taken its imports of oil up sharply from about 2 million tons per year to nearly 10 million tons per year in 2004. China's oil imports have risen 35 percent in the past year, and China alone, according to the *Bank Credit Analyst*, will account for about 40 percent of the growth in global oil demand in 2004.

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Coupled with a sharp surge in Chinese demand for oil is the strong increase in U.S. demand for oil that became more pronounced during the growth surge over the past year. The Fed's negative real fed funds rate coupled with extra fiscal stimulus boosted U.S. growth to nearly 5 percent from the middle of 2003 to the middle of 2004. As a result of strong

growth in China and the United States, the International Energy Association revised its 2004 oil demand forecast to 81.4 million barrels per day—up from its year-ago forecast of 79.1 million barrels per day. The demand for oil is projected to continue to rise by another 1.8 million barrels per day by 2005.

This surge in oil demand (especially over the last two years), concentrated in China and the United States, has boosted oil usage to a level close to capacity. The supply of oil has been highly elastic up to usage at a level of about 80 million barrels per day. Since then, the supply curve has become more and more inelastic and is approaching verticality (zero supply elasticity) at a level above 82 million barrels per day—approximately current usage. The surprise in the oil market is that while no one was looking, the surge in oil demand emanating particularly from China and the United States pushed usage to a level close to capacity. With the oil supply curve nearly vertical at current levels, any increases in demand will boost the price further. In fact, the higher oil usage goes, the less elastic oil supply becomes, so that the projected increase in usage of about 1.8 million barrels per day over the coming year may produce a bigger increase in the price than the 2.5 million barrel-per-day increase in usage did over the past year.

Years of oil shocks tied to threatened temporary interruptions in supply led to a sharp rebuilding of oil inventories and a spike in the price that was ultimately reversible. But now we have reached capacity output levels for oil. The short-run supply curve for oil is virtually inelastic so that the price is now determined by demand. Steady

growth of oil demand will continue to raise the price until substantial investment in oil production and distribution facilities shifts out the oil supply curve.

The longer-run oil supply picture is not bright either. Substantial additions to capacity to move oil from the ground to refineries and through refineries to final usage are not underway and are not even contemplated. After years of falling real oil prices, oil producers feel no real incentive to add to capacity, and even when they do, it will take at least five years to bring such additional capacity on stream. Some say ten.

### The Fed's Dilemma

The emergence of a demand-determined oil price presents the Fed and other central banks with painful choices. True, the Fed's heavy stimulus with a negative real fed funds rate shortened the time it took demand to shift to capacity levels in the oil market. After all, given that the Chinese currency is pegged to the dollar, the Fed serves as central bank both for the United States and China. Eighteen to twenty-four months of negative real interest rates contributed to the sharp increase in growth rates in both countries and, simultaneously, to sharp increases in oil usage. That said, when deflation threatened, the Fed probably had no choice but to pursue negative real short-term interest rates since a deflationary spiral would have produced a worse outcome than the admittedly difficult one that results from sharply higher oil prices.

Once oil prices are demand-determined they become part of the equilibrating process that slows growth to a level consistent with a stable, or slower-rising, price of oil. The U.S. economy has not broadly overheated, even with negative real interest rates, thanks to the ample capacity built during the bubble years in the stock market. But the strong U.S. growth resulting from heavy policy stimulus since 2001 has pushed oil demand more rapidly to levels that represent maximum current capacity oil output.

China's growth surge has put extra heavy pressure on oil supplies because as a developing economy, China is a relatively inefficient user of oil. A unit of output increase consumes more oil in China than in other countries, and that is why China has accounted for nearly 40 percent of the growth in oil demand over the past year.

With the world economy facing capacity oil production, the rising price of oil signals a constraint on the level of global demand growth implicit in negative short-term real interest rates in the United States. Demand growth can be constrained either with still higher oil prices, a sharply higher real fed funds rate, or some combination of the two. In its statement after raising the fed funds rate by 25 basis points, the Fed stated that monetary policy is still accommodative. Indeed it is, with most inflation measures running between 2 and 3 percent and the fed funds rate at 1.5 percent. If the Fed were to leave the fed funds rate at current levels, oil prices would have to increase by more than they will if the Fed tightens further. The rising oil price becomes a brake on demand growth by taxing consumers and producers. Higher oil prices have already reduced U.S. household incomes by about \$40 billion this year, at about an annual rate of \$80 billion or 0.8 percent of GDP.

The hawkish sounding statement from the Federal Reserve Open Market Committee after its August 10 meeting suggests that it probably understands the dynamic running from the oil market to the economy. By stating that it still sees its policy as accommodative and indicating that it expects higher growth in the future, the Fed signaled that it will continue to raise the fed funds rate until it reaches at least 2 percent by the end of this year. However, with the oil price constraint operating, the choice is a painful one. The more oil prices rise as a means to slow demand growth, the more a stagflationary environment appears and the more danger there is of a sharp drop in stock prices, which itself would help to constrain demand growth in a painful way. Alternatively, if the Fed raises the fed funds rate too rapidly in an attempt to brake rising oil prices, that too could cause a sharp drop in equity prices. In fact, U.S. stock prices have already begun to fall, with the broad S&P Index about 10 percent below its highs in March.

### Economic Impact of More Expensive Oil

Given that global oil demand is approaching capacity levels for the oil industry, prices will have to stay high enough for long enough to induce significant additions to oil infrastructure capacity both in terms of moving oil out of the

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ground to refineries and with refining oil for end users. A sustained period of higher oil prices produces serious economic dislocations, not only for households, but also for firms that have been moving toward more energy intensive technology over the past two decades. It is true that oil usage as a share of GDP is considerably lower than it was in the 1970s, but it is still a significant input for households and firms. An obvious example relevant for both households and firms is the mix of motor vehicle fuel efficiency. With gasoline at or above \$2 a gallon, production facilities for SUVs weighing between 2.5 and 3 tons become immediately less valuable. So too do energy-intensive production technologies where heavier energy use is substituted, say for more labor, in the production of goods and services. Households running energy-inefficient vehicles, not to mention larger homes, will find fuel costs and heating and cooling costs higher than anticipated.

Some will be tempted to cushion the pain of higher oil prices by cutting oil taxes or drawing on the Strategic Petroleum Reserves. Both steps would be a mistake and would only prolong the period of adjustment to higher oil prices. These lessons ought to have been learned during the 1970s. The Strategic Petroleum Reserve is just that—strategic. It contains about 700 million barrels of oil intended for use in the event of physical disruption of supply. With the U.S. importing about 12 million barrels a day, we could only manage for two months of a total supply interruption

given current levels. It would be shortsighted to use the Strategic Petroleum Reserve to attain a very brief slowdown in the increase in the price of oil. Oil is a scarce resource that needs to be conserved while we wait for additions to available supply. Higher oil prices are necessary to contain demand growth and speed up the construction of oil infrastructure to increase supply.

The painful truth that has emerged over the past six months, as the price of oil has continued to rise while the global economy slowed, is that the higher price of oil is part of the adjustment process underway to a new reality. That new reality is that oil usage at a rate consistently above 82 million barrels per day will require a higher oil price because there is not much more oil than that available. If demand continues to grow more rapidly, and it will as long as the real federal funds rate is negative, the price of oil will only increase more rapidly until demand growth is sufficiently constrained to stabilize the price. We are not out of oil; we simply have about 82 million barrels per day available for the world's households and industries to use, perhaps a little more

as higher prices draw in heretofore-marginal production facilities. If the price remains at current levels or rises higher, more production and refining capacity will eventually come on stream, but the pipeline is long and there is no sign, as yet, of a major supply response from the oil industry. Stagflation will be with us for a while.

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