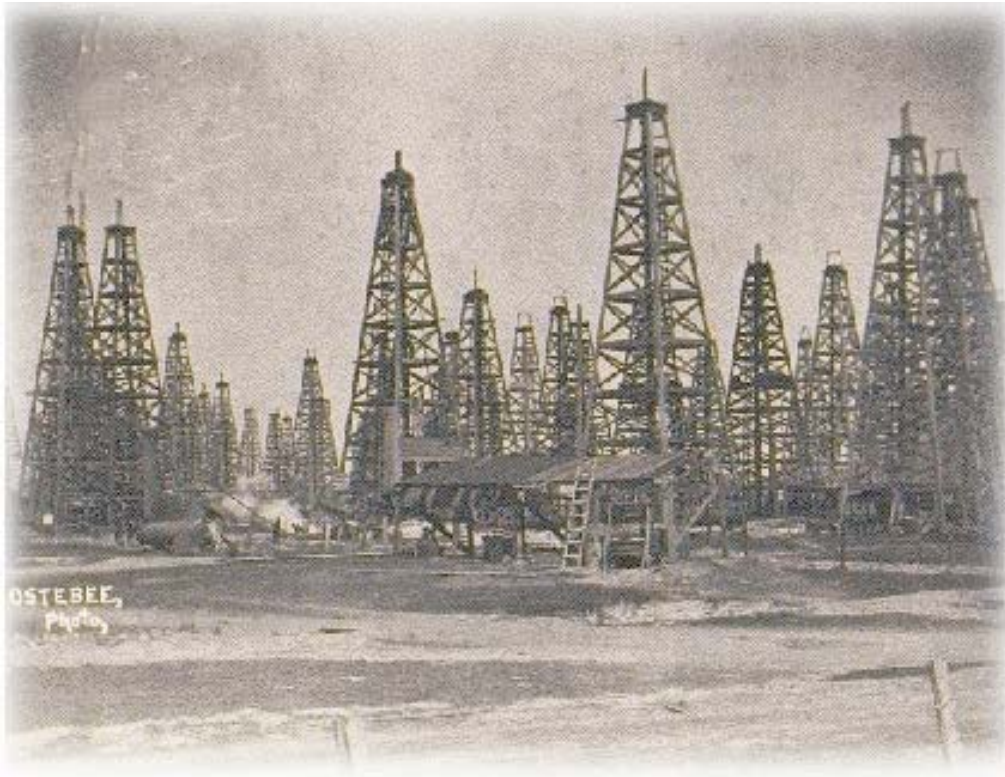


Oil and the Economy



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Oil Prices and the Economy

Since it first bubbled from the ground in Pennsylvania in 1859, oil has had a grip on the economy. Since it was first formed in 1960, OPEC has had a grip on oil prices. In this analysis, we consider whether oil and OPEC still have the same hold on the economy.

We examine recent oil price movements from a long-term perspective and assess the consequences for economic activity. We show that current oil prices are moderate by historical standards, and that substantial increases are unlikely. OPEC continues to be a major factor in world oil markets, affecting oil price volatility. U.S. economic activity is still hurt by rising oil prices, but less than it was twenty years ago. Similarly, regional economic activity is less sensitive to oil price changes.

The World Oil Market

We first look at world oil markets and the continuing role of OPEC. As is well known, oil prices have been very volatile in recent years. OPEC has been a major factor in the volatility of oil prices, with help from fluctuating world demand.

Figure 1 shows that prices dropped to a low of about \$11 per barrel in the last week of 1998, then climbed to a ten-year high of \$34 in early March of this year. The tripling of oil prices in the last 18 months came about because of greater than anticipated demand and decreased supply. Mexico, Norway, Russia and Oman agreed to output cuts along with OPEC, putting considerable upward pressure on prices. This price increase looks pretty similar to the 1979-81 price hike which led to a severe recession.

When adjusted for inflation, however, prices are about the same as they were in the early 1970s and much lower than they were in the early 80s (Figure 2). Prices almost tripled to near \$10 in early 1974. In today's dollars that is equivalent to \$33 per barrel. The high of \$38 per barrel reached in 1982 would be \$72 in today's dollars. Similarly, for gasoline prices to reach the highs of the early 1980s, they'd have to average \$2.55 per gallon nationally. The current national average price is now about \$1.50 per gallon.

Figure 1

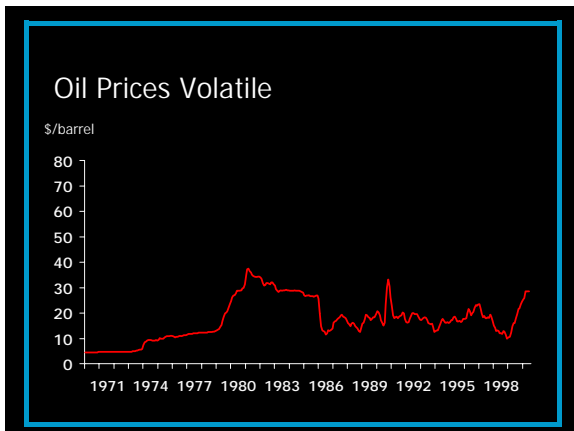


Figure 2

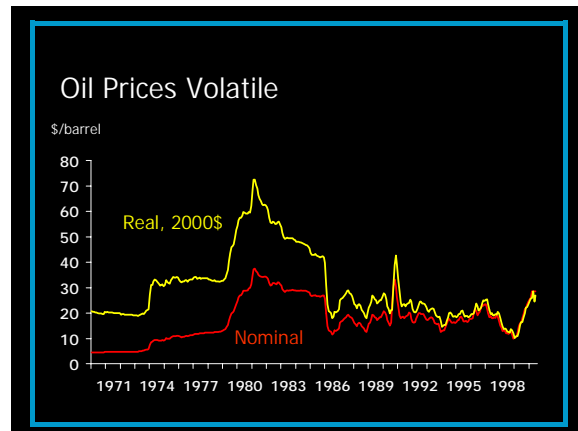
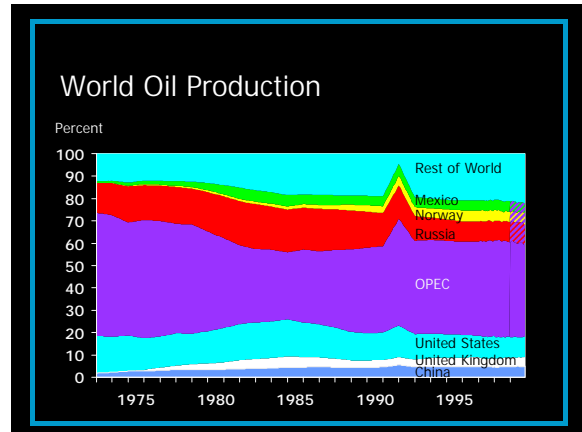


Figure 3

The U.S. is a mature oil basin. Our production peaked in 1970 and has been declining since (see Figure 3). In 1970 U.S. production was around 22 percent of world output. Today we produce 12 percent of world oil output. OPEC's share has also declined from the 55 percent of world output in 1970. But it is still a hefty 40 percent today. When Russia, Norway and Mexico decided to join OPEC in output cuts last year, the output share of these countries summed up to 60 percent of world output. This is shown by the shadowed portion of the figure. (No wonder the oil price went up to \$34!)



Although we produce 12 percent of world output, we consume 26 percent of it, hence we import nearly 55 percent of what we consume. As the economy grows and oil production declines we should expect this number to rise. A high import dependency is not necessarily a bad thing in itself. Japan imports 100 percent of its oil. However, because a major share of world oil production comes from politically unstable parts of the world, there may be political and security risks.

World dependence on oil from OPEC and politically unstable parts of the world will continue as Figure 4 illustrates. The figure shows oil reserves in various areas of the world. OPEC holds 65 percent of world oil reserves.

OPEC has now decided to keep the price in a band which would correspond to \$25 to \$30 per barrel for West Texas Intermediate crude oil. If prices go above \$30 for 20 days, they'll increase production, and lower production if prices fall below \$25. The band is shown in Figure 5. OPEC has found that a price much higher than \$30 is not sustainable because it leads to an increase in non-OPEC supply and conservation. A low price is bad for OPEC finances. It is estimated that for each \$1 drop in the price of oil, Saudi Arabia loses \$2.5 billion dollars in annual revenue.

Figure 4

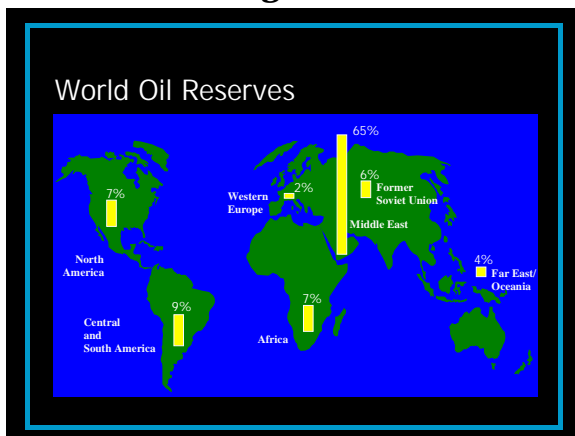
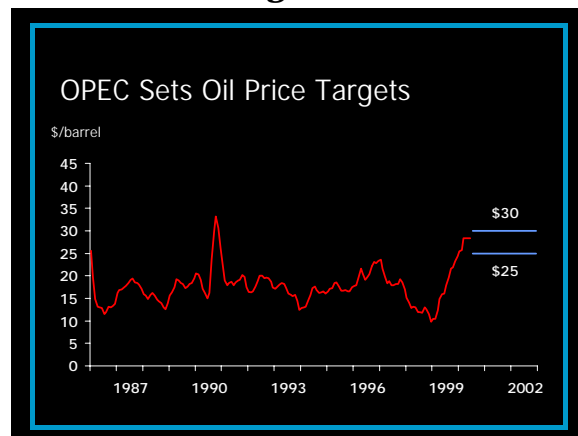


Figure 5



Oil Prices and U.S. Economic Activity

As we've illustrated, OPEC still has a grip on the oil market and will remain a major factor in oil price fluctuations. A considerable body of economic research (including our own) suggests that oil price fluctuations have figured prominently in national economic activity since World War II. We now show that oil's influence on the economy may be weakening.

Figure 6 shows oil prices and the nine post-WWII recessions. The recessions are shown as gray bars. Figure 7 highlights the oil price increases that are not simply the reversal of declines that occurred during the year before. As can be seen in the figure, rising oil prices preceded eight of the nine post-WWII recessions. The 1960 recession is the one exception. Not much of a price hike preceded the recession in 1970.

Figure 6

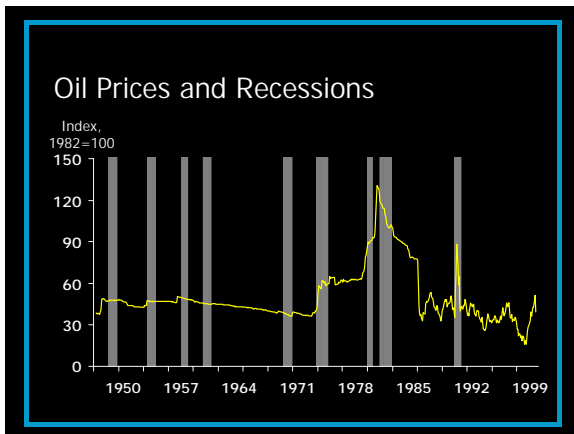
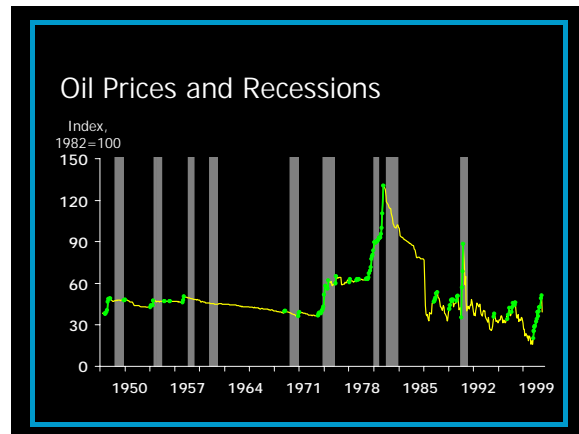


Figure 7



In the 50s and 60s, the economy was so sensitive to oil prices that small oil-price increases led recessions. Since the mid-1980s, we have seen a number of instances in which rising oil prices did not lead to recessions. Oil price fluctuations seem to have less of an effect on economic activity today than in the past.

Rising oil prices can be indicative of a classic supply-side shock. Rising oil prices signal increased scarcity of energy which is a basic input to production. Consequently, output and productivity growth slow. The decline in productivity slows real wage growth and increases the unemployment rate at which inflation accelerates. Under a monetary policy that maintains a constant nominal GDP, the price level rises by the amount GDP falls. If consumers expect the rise in oil prices to be temporary, they will attempt to save less to smooth out their consumption, which will boost the interest rate.

Research shows a strong relationship between oil prices and the unemployment rate. As shown in Figure 8, rising oil prices led increases in the unemployment rate in 70s, 80s, and early 90s. Unemployment declined with oil prices from 1982 through 1990 and in the late 1990s. Rising oil prices retard productivity growth and raise the rate of unemployment at which inflation accelerates. Lower oil prices stimulate productivity growth and lower the rate of unemployment at which inflation accelerates. The figure suggests the relationship may have weakened in the late 1990s, as the economy increasingly turned away from energy-intensive industries toward the high-tech industries that characterize the new economy.

Figure 9 shows oil prices and a 12-month moving average of inflation as measured by the consumer price index. Economic research that we and others have conducted suggests that rising oil prices contribute to inflationary pressures. This relationship is obscured somewhat in the 1970s, however. During the 1970s U.S. inflation appeared to lead increases in the price of oil. A rising U.S. price level put downward pressure on the real value of the dollar in international exchange. The weaker dollar boosted the dollar-denominated demand for oil and helped push oil prices upward. At the same time, OPEC sought to maintain the purchasing power of its oil exports by increasing the price.

Figure 8

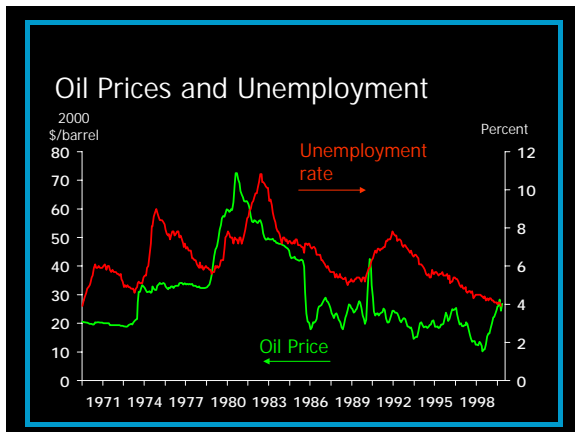
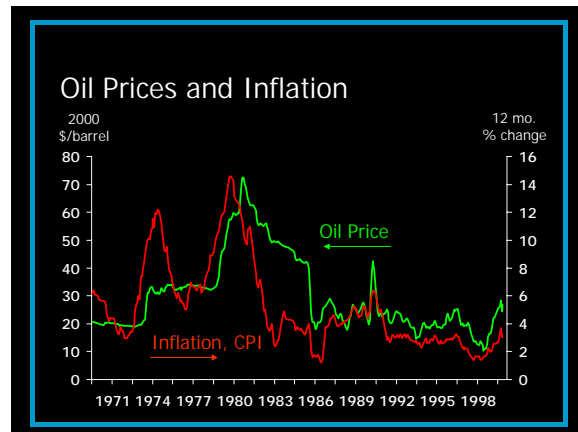


Figure 9

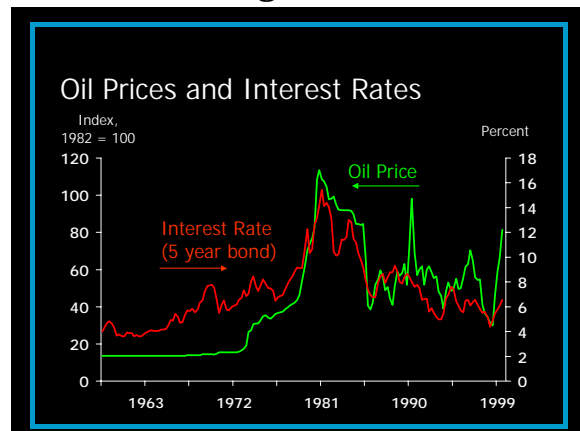


In the early 1980s, U.S. disinflation reversed the process. Since the mid-1980s, however, movements in inflation and oil prices have been roughly coincident. We have also seen a weaker link between rising oil prices and core inflation—that is, inflation in all items except food and energy. This measure of inflation is thought to provide a better signal of underlying inflationary pressure because it is less susceptible to the fluctuations associated with food and energy prices. A recent study on oil prices and inflation shows that since 1980, there is little or no pass-through from oil price changes to core inflation. While before 1980, oil shocks contributed substantially to core inflation. The weaker link suggests that monetary policy has been more effective in combating the inflationary effects of oil price shocks since the mid-80s.

Nevertheless, rising oil prices seem to lead to higher interest rates as illustrated by Figure 10. If consumers see oil price increases as temporary, as is suggested by futures prices, they would also consider the loss of output and income associated with higher oil prices to be temporary. To smooth their consumption across periods of lower income, consumers would attempt to save less which would boost interest rates.

Similarly, Alan Greenspan recently argued that consumers will attempt to smooth their consumption in the face of expectations of rising income associated with productivity growth. The increased borrowing will boost market interest rates.

Figure 10

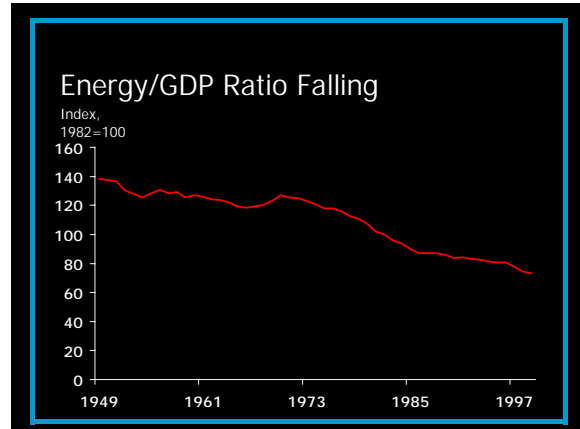


Our research at the Dallas Fed suggests that some of the recent increases in the federal funds rate may be part of a general increase in interest rates that results from higher oil prices. To the extent the Federal Reserve does not allow the federal funds rate to rise with these increases in market interest rates, inflation would be greater and more evident in the core.

One reason recent oil price hikes may have had less impact on national economic activity is that the amount of energy consumed in producing each dollar of GDP has declined. As Alan Greenspan has said, "Today's GDP is lighter and smaller." As shown in Figure 11 however, this development is not new.

The largest declines in energy consumption per dollar of GDP came during the 1970s through early 1980s when oil prices were rising rapidly. The declines slowed after oil prices collapsed in 1986. Our back-of-the-envelope calculations suggest that the U.S. economy is about one-third as sensitive to oil price fluctuations today than it was when oil prices were at their height in the early 1980s. Our calculations also suggest that the U.S. economy is about one-half as sensitive to oil price fluctuations than it was in the early 1970s when real oil prices were about the same as they are today.

Figure 11



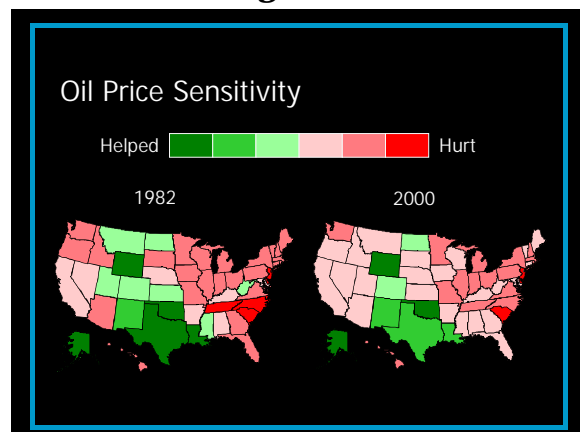
Oil Prices and Regional Economic Activity

As might be expected, the effects of oil price movements differ across the states. The economies of the energy-producing states, such as Alaska, and the three Eleventh District states—Louisiana, New Mexico and Texas—are helped by rising oil prices. The economies of the energy-importing states, including eight of the nine Twelfth District states—California, Arizona, Hawaii, Idaho, Nevada, Oregon, Utah and Washington—are hurt by rising oil prices.

We estimate that rising oil prices would have hurt economic activity in 37 states and the District of Columbia in 1982, as shown in red on the map in Figure 12. The darker the red, the stronger is the effect. For the other 13 states, shown in green, rising oil prices would have boosted economic activity in 1982. Again, the darker the green, the stronger is the effect.

At the present (2000), only eight states are helped by rising oil prices. Changes in the composition of economic activity in Kansas, Mississippi, Montana, Utah and West Virginia have been such that these states are now hurt by rising oil prices rather than being helped as they were in 1982. We also see a reduction in the intensity of response in the other energy-producing states. For example, we estimate that the Alaska economy is about 10 percent less sensitive to oil price fluctuations today than it was in 1982. We estimate that the Eleventh District economy is only one-fourth as sensitive to oil price movements today than it was in 1982.

Figure 12



Furthermore, many of the state economies that are hurt by rising oil prices are now less sensitive to oil price increases than they were in 1982. For example, we estimate that the seven of the Twelfth District states that import energy are about 60 to 70 percent less sensitive to oil price fluctuations today than they were in 1982. Diversification away from both energy-intensive industries and energy production are making the states more like each other in their response to oil price movements.

Conclusions

It seems we have less reason to be concerned about higher oil prices today. Even though oil prices tripled over the past 18 months, they are moderate by historical standards.

Given its market share, large reserves and low production costs, OPEC will remain dominant in world oil markets. Although OPEC has been a major factor in oil price volatility, its current policy offers the prospect of stable prices.

Both the national and regional economies have diversified away from energy-intensive and energy-producing industries. Consequently, our economy is less sensitive to oil price changes.