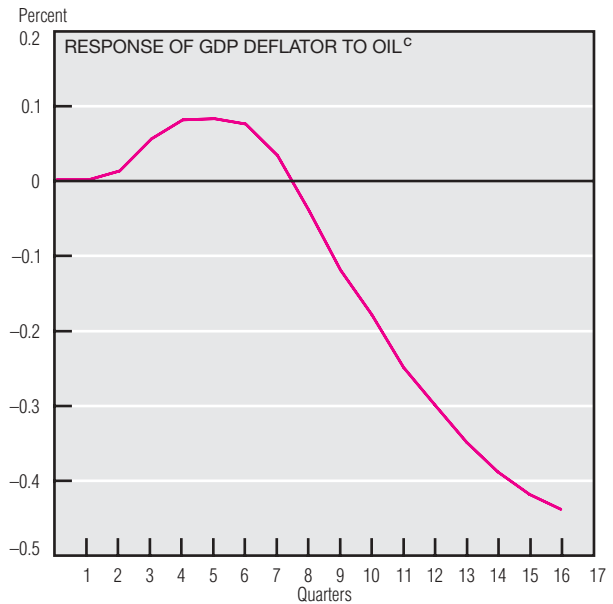
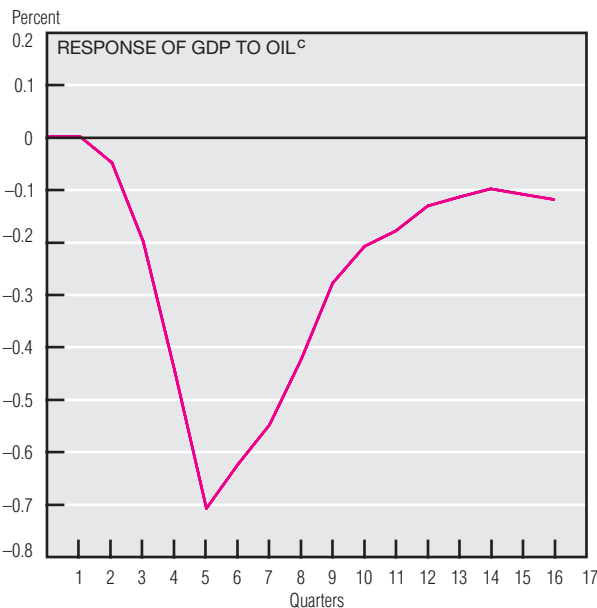
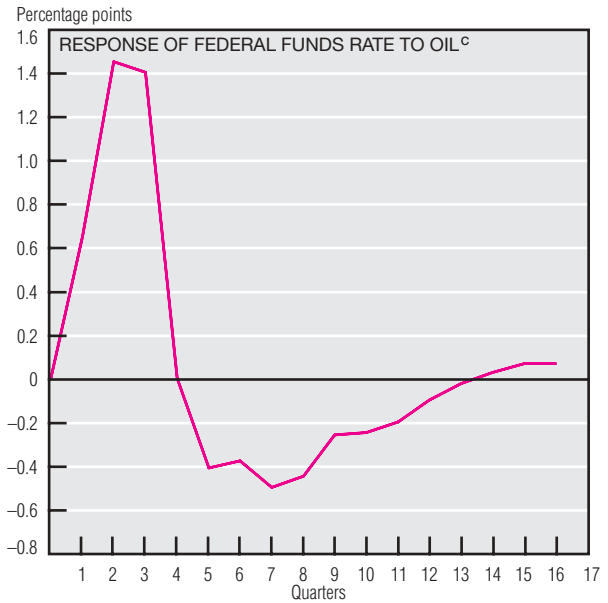
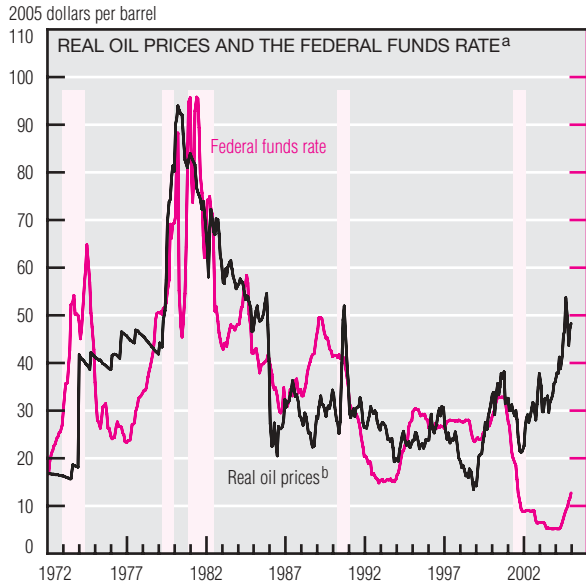


Oil Prices and the Macroeconomy



a. Shaded bars indicate periods of recession.

b. Price of West Texas intermediate crude oil, deflated by the Consumer Price Index.

c. Impulse response functions are taken from Ben S. Bernanke, Mark Gertler, and Mark Watson, "Oil Shocks and Aggregate Macroeconomic Behavior: The Role of Monetary Policy, A Reply," *Journal of Money, Credit, and Banking*, vol. 36, no. 2 (April 2004), 287-91.

SOURCES: U.S. Department of Labor, Bureau of Labor Statistics; Board of Governors of the Federal Reserve System, "Selected Interest Rates," *Federal Reserve Statistical Releases*, H.15; and *Wall Street Journal*.

Increases in oil prices and the funds rate have preceded every recession since the early 1970s. Oil price increases usually depress economic activity, but part of the decline in output results from the funds rate increase that typically occurs in conjunction with oil shocks; the reason is that oil shocks also increase inflationary pressures. To keep these pressures at bay, the Fed usually also increases the funds rate. Holding everything else constant, how much do an oil price shock and the ensuing funds rate increase affect GDP and inflation?

Empirical work suggests oil's influence on the economy is asymmetric: Oil price increases tend to depress economic activity while decreases raise GDP only slightly. Therefore, oil shocks are typically measured as price increases rather than decreases. A 10% rise in oil prices has typically led to an increase in the funds rate of almost 1.5 percentage points one quarter later, holding everything else constant. This increase, like the oil shock that preceded it, is typically very short-lived; it is reversed two quarters later.

Researchers have estimated the joint impact on output of higher oil

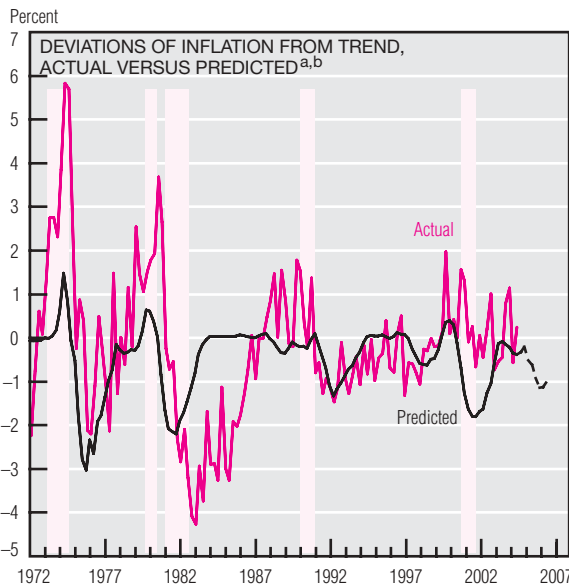
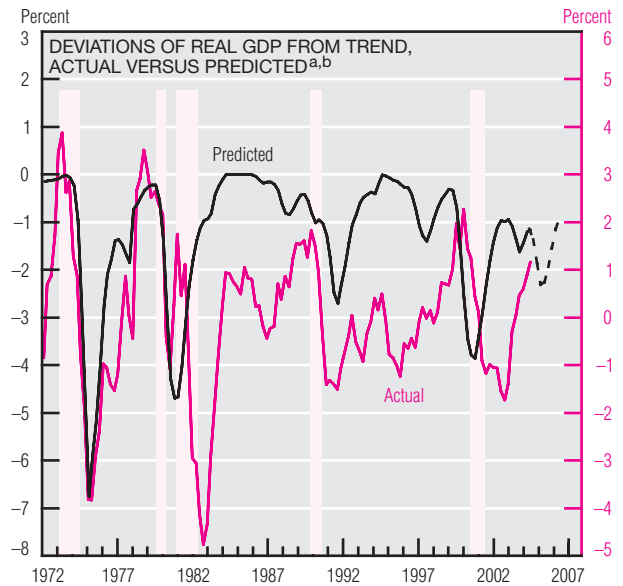
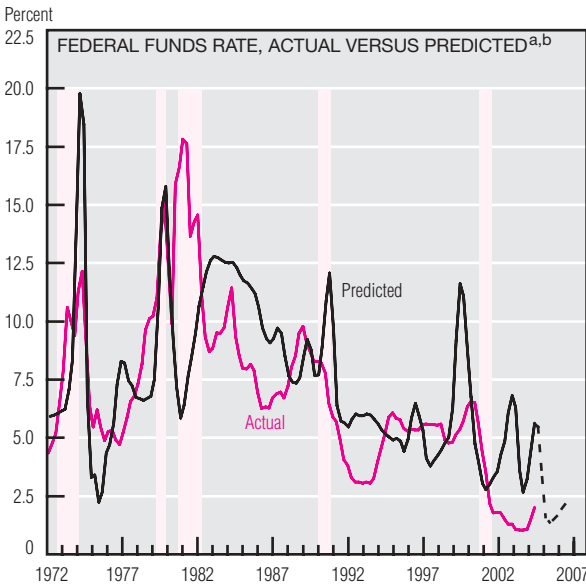
prices and the ensuing increase in the funds rate. Their estimates suggest that a 10% oil shock causes a persistent decline in output that culminates in a 0.7% decline four quarters later.

The same oil shock leads to transient price increases. But these are short-lived and small compared to the subsequent decreases that probably result from prices' delayed reaction to the sharp tightening of monetary policy associated with oil shocks.

These estimated responses allow simulations of hypothetical output,

(continued on next page)

Oil Prices and the Macroeconomy (cont.)



Standard Deviations

	Actual	Predicted	Ratio (predicted/ actual)
Inflation ^c	1.69	0.75	0.45
Real GDP	1.60	1.31	0.82
Federal funds rate	3.40	3.20	0.94

a. Predicted series are calculated using the impulse response functions shown. Ben S. Bernanke, Mark Gertler, and Mark Watson, "Oil Shocks and Aggregate Macroeconomic Behavior: The Role of Monetary Policy, A Reply," *Journal of Money, Credit, and Banking*, vol. 36, no. 2 (April 2004), 287–91.

b. Shaded bars indicate periods of recession.

c. Implicit GDP deflator.

SOURCES: U.S. Department of Commerce, Bureau of Economic Analysis; Board of Governors of the Federal Reserve System, "Selected Interest Rates," *Federal Reserve Statistical Releases*, H.15; and *Wall Street Journal*.

funds rate, and inflation series under the assumption that oil shocks are the only ones hitting the economy. With only oil shocks, one would expect funds rate variability to be 94% of the actual observed variability. This is slightly misleading because the simulated funds rate displays many movements that are not contained in the data. Yet it clearly does pick up some of the lower-frequency, longer-term movements in the funds rate.

With only oil shocks, the combination of oil and the ensuing funds rate changes explains 82% of the observed

variability in output. Comparing the timing of actual recessions and the behavior of simulated output, the lead lag patterns for the impact of oil and the funds rate on the economy are not stable. For some recessions, like those of 1974–75 and 1991, the response is coincident. For others, like 2001, the downturn in the simulated series occurs approximately four quarters before the downturn in the economy. However, the impact of an oil shock and the subsequent response of the Federal Reserve seem to be associated with a large part of observed output declines.

But inflation's behavior suggests that oil, combined with the funds rate, can explain approximately 45% of inflation's movements. Clearly, the simulated series picks up almost none of inflation's quarter-to-quarter movements. At a lower frequency, however, inflation movements are partly driven by oil and the subsequent change in the funds rate. This analysis suggests that the Fed's past policy toward oil has been to mitigate the inflationary consequences of an oil price shock.