



## Inflation, Exchange Rates, and Oil Prices

Crude oil is priced and traded in U.S. dollars. However, most producers and users of refined oil products around the world earn and spend other currencies. Furthermore, inflation occurs at different rates in different countries. The theory of purchasing-power parity (PPP) suggests that changes in exchange rates should offset inflation differentials, at least in the long run, keeping the "real" price of a common basket of goods and services roughly comparable across countries. Can we use PPP to explain movements in the inflation-adjusted, local-currency prices of crude oil?

The figure below compares inflation-adjusted, local-currency oil prices in the United States, Japan, and Germany during the last four decades. Expressed in terms of 1995 consumer prices, a barrel of oil cost \$15.39, ¥5862, or DM39.79 in the first quarter of 1960. A barrel of oil cost \$27.87, ¥3350, or DM63.80 in the third quarter of 2000, also expressed in 1995 prices. For convenience, the figure shows indexes of inflation-adjusted, local-currency oil prices that have been rebased to equal 100 for each country in the first quarter of 1960.

Inflation-adjusted, local-currency oil prices (excluding taxes) are much lower now in Japan than 40 years ago, even after the sharp recent increase. Of the three major subperiods evident in the chart—the "pre-oil shocks period" of 1960-1972, the "oil shocks period" of 1973-1985 and the "post-oil shocks period" of 1986-2000—only during 1986-2000 were average real oil prices lower in yen terms than they were in the third quarter of 2000. On the other hand, inflation-adjusted oil prices in dollars and marks (or euros) are relatively high now compared to previous periods. Only during 1973-1985 were real oil prices higher in the United States and Germany than they were in the third quarter of 2000.

Clearly, forecasts of oil prices based on PPP using consumer-price indexes and current exchange rates would not have been very accurate in recent decades. First, the dollar price of oil changed erratically during the last 40 years compared to the prices of broad consumer baskets of goods and services. This is indicated by abrupt upward and downward movements in the index levels in all three countries. Second, real exchange rates between the dollar, yen and mark (euro) have also varied substantially. This is demonstrated by the divergent time paths of real oil prices facing consumers in the three countries investigated here.

The chart demonstrates that the recent inflation-adjusted, local-currency oil-price shock has been greatest in percentage terms in Germany among the three countries considered here. The real mark (or euro) price of crude oil increased by 211 percent from the fourth quarter of 1998 through the third quarter of 2000, compared to 133 and 125 percent increases in real dollar and real yen terms, respectively. The much greater price impact evident in Germany reflects the fact that the mark (euro) has depreciated significantly against the dollar and yen during the last two years.

—William R. Emmons

