

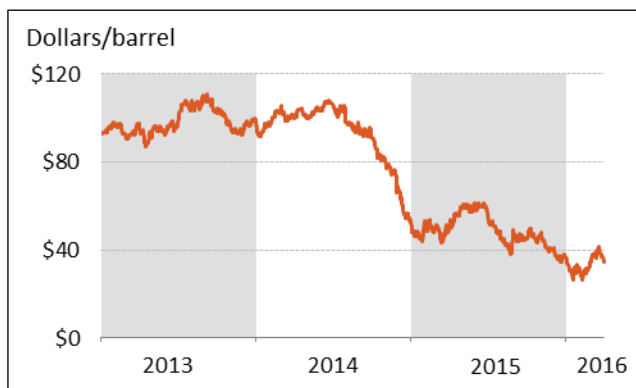


Oil Prices and the Value of the Dollar

Oil Prices

Oil prices, as measured by the spot price of West Texas Intermediate (WTI), achieved a level of \$107.95 per barrel on June 20, 2014. By March 14, 2016, the price of the same barrel of oil had sunk to \$37.20 per barrel, a decline of over 65%. The fall in the price of oil was not continuous. After the initial decline, oil prices seemed to have stabilized in the \$60 per barrel range from April 2015 through June 2015, but then began to decline again.

Figure 1. Spot Price of West Texas Intermediate Oil, 2013-2016



Source: Energy Information Administration, oil price data. Graphic by CRS.

Many explanations have been given for the decline in oil prices. On the market fundamentals side, weak economic growth, almost worldwide, was credited with reducing overall oil demand growth. On the supply side of the market, rapid growth of U.S., and other, non-conventional oil supplies, as well as increasing production in Iraq, were creating a supply glut, resulting in record amounts of oil held in storage. With respect to political/economic factors, the Organization of the Petroleum Exporting Countries (OPEC) declined to make production cuts that would limit supply and potentially support prices. In addition, economic sanctions against Iran appeared likely to be lifted, potentially introducing even more oil supply into an already over-supplied world market.

The Value of the Dollar

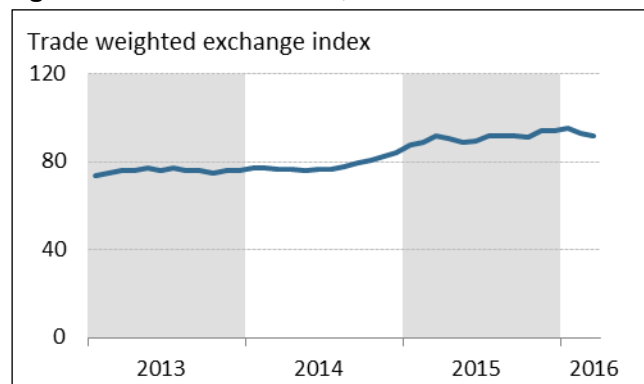
An additional factor affecting oil prices that received analyst attention during the oil price decline was exchange rates, or, in particular, the value of the U.S. dollar. The link between the value of the dollar and the spot price of WTI is, for many, one of the more opaque factors in oil pricing.

On the world oil market, oil is priced in U.S. dollars, and all oil market transactions result in transfers of dollar balances. As a result, the United States is, in effect, an indirect participant in all world oil trades through the use of its currency. This indirect participation occurs through the

mechanism of the exchange rate, the value of the U.S. dollar compared to the values of other currencies worldwide.

The U.S. dollar serves as a reserve currency for the world economy. This means that most nations hold dollars to facilitate international trade, as well as a way to hold wealth. However, the dollar's value, computed as the number of dollars it takes to purchase one unit of a foreign currency, or a specified basket of currencies, varies almost continuously, reflecting world economic conditions. Currency values are reciprocal, in the sense that when the U.S. dollar rises compared to, say, the Japanese yen, this is equivalent to saying that the Japanese yen has fallen in value compared to the U.S. dollar.

Figure 2. Value of the Dollar, 2013-2016



Source: Federal Reserve Bank of St. Louis, exchange rate data. Graphic by CRS.

The value of the dollar as measured against a trade-weighted index of major currencies began increasing in July of 2014 when the index measured 76.3729. By March of 2016 the index stood at 92.9248, representing an increase of over 21%. With respect to the time trend, it appears that the value of the dollar began increasing soon after oil prices began to fall in June of 2014, and continued to rise over the period of declining oil prices, but by a percentage magnitude of only approximately one third of that of the change in oil prices. This pattern of oil price and exchange rate data suggests that exchange rates, while not precipitating the fall in oil prices, could be a factor in their continuing decline.

Exchange Rate Determination

The value of a nation's currency depends on a variety of economic factors related to the world demand for the currency and the supply of the currency on the world currency market.

Economic factors important in exchange rate determination include inflation rate differentials between countries,

interest rate differentials between countries, relative current account deficits, the levels of public debt, the terms of trade (export prices divided by import prices), political stability, and relative employment and economic growth performance.

The following three examples represent cases of changing economic conditions resulting in an increased demand for a nation's foreign exchange, which likely would lead to an appreciation of the currency. First, if inflation rates vary between countries, this can lead to a changing balance of trade between the countries as the nation with the lower inflation rate gains sales on the international market compared to higher cost producers. Second, higher interest rates in one country compared to another can cause changes in international capital flows as investible funds seek the highest rate of return, given the level of risk. Third, perceptions of lower risk associated with a nation's economy or political structure for a given rate of return might also result in an inflow of international capital.

Oil Demand and the Exchange Rate

If the value of the U.S. dollar rises compared to other nation's currencies, this affects the demand for oil in those other nations. Since oil is priced in dollars, those dollars must be purchased by oil suppliers in the foreign nation. Since the dollar has appreciated (the value of the foreign nation's currency has declined) a larger amount of domestic currency must be used to purchase the number of dollars required to buy a barrel of oil. The effective increase in the price of oil, measured in domestic currency, is likely to result in higher prices for petroleum products in the domestic market as costs are passed on to ultimate consumers. In general, the quantity demanded of a product tends to decline in the face of higher prices. As a result, it is likely that the demand for gasoline, diesel fuel, etc. in foreign countries will decline when the value of the dollar increases.

As the demand for oil declines in countries whose currencies have depreciated against the dollar, a decline in world demand for oil, or at least the growth in world oil demand, is likely. Given supply, a decrease in world demand is likely to put downward pressure on the world price of oil. As a result, one might conclude that an increase in the value of the dollar gives rise to a short-term decline

in the demand for oil, followed by a decline in the price of oil which, at least qualitatively, negates the effect of the increase value of the dollar on the oil market. As the price of oil declines, measured in dollars, demand is likely to increase in the longer term.

The same type of effect also works in the opposite direction. If the value of the dollar declines against other currencies (other nation's currencies appreciate), purchasing the required number of dollars needed to buy a barrel of oil declines. Oil appears cheaper, measured in foreign currency. This causes the world demand for oil to increase, tending to increase the price of oil.

During the oil price surge between the third quarter of 2007, and peaking in July of 2008, the price of oil increased by over 50%. During this period the value of the dollar declined by about 4%. This behavior suggests that, at least qualitatively, the inverse relationship between the value of the dollar and the price of oil holds, both for appreciation and depreciation of the dollar.

A key factor in assessing the quantitative magnitude of the dollar/oil price relationship is the sensitivity of the relationship between the quantity of oil demanded in the nations whose currency has depreciated against the dollar and changes in the price of petroleum products measured in the domestic currency. Empirical evidence suggests that this value, called the elasticity of demand by economists, is low. This implies that a given percentage change in price results in a less-than-proportionate change in quantity demanded, implying, when all countries' demand are aggregated, a small change in the world demand for oil, with small effects on the world price.

Conclusion

Although the qualitative relationship between the value of the dollar and the price of oil is consistent, its quantitative magnitude is likely not sufficient to explain, on its own, the price surges and declines observed in the oil market. Like many factors which go into determining world oil prices, the value of the dollar is one, but not the only, factor.

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