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CRS Report for Congress

The U.S. Trade Deficit, The Dollar, and The Price of Oil

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Summary

Rapid changes in the price of oil and the impact of such price changes on economies around the globe has attracted considerable attention. In mid-2008 as the price of oil rose to unprecedented heights and then dropped sharply, the international exchange value of the dollar fell and then rose relative to a broad basket of currencies. For some, these two events seem to indicate a cause and effect relationship between changes in the price of oil and changes in the value of the dollar. Despite common perceptions that there is a direct cause and effect relationship between changes in the international exchange value of the dollar and the price of oil, an analysis of recent data indicate that the rise in the price of oil is being driven by an increase in demand that is exceeding the increase in supply.

This report analyzes the relationship between the dollar and the price of oil and how the two might interact. While the data do not support a strong cause and effect relationship between the value of the dollar and the price of oil, there likely are various channels through which changes in the price of oil and in the value of the dollar may be indirectly correlated. The data also indicate that an increase in the demand for crude oil that exceeded the increase in the supply of oil and a laggardly pace in oil production capacity likely are among the main factors behind the sharp run up in the price of oil in the first seven months of 2008. The rise in oil prices also is affecting the U.S. trade deficit. This report provides an assessment of the impact a range of prices of imported oil could have on the U.S. trade deficit.

This report will be updated as events warrant.

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Overview

To most observers, it seems apparent that the rise in the price of oil[1] from 2006 through mid-2008 and the decline in the exchange value of the dollar are interconnected events, or that there is some cause and effect relationship between the two.[2] Since oil is priced in dollars, this line of reasoning goes, as the exchange value of the dollar declines, the purchasing power of oil producers also falls, which, in turn, prods oil producers to reduce their supplies to the market in order to push up the market price of oil and restore their purchasing power. This line of thinking is not unreasonable, considering various incidents, most notably 1973 and 1979, in which the price of oil rose sharply in response to actions taken by members of the Organization of Petroleum Exporting Countries (OPEC)[3] group of oil producers to increase the market price of oil. Indeed, OPEC's stated objective is to co-ordinate and unify petroleum policies among OPEC Countries, in order to secure "fair and stable prices for petroleum producers; an efficient, economic and regular supply of petroleum to consuming nations; and a fair return on capital to those investing in the industry." After reaching nearly $147 per barrel in August 2008, the price per barrel of oil dropped to nearly $100 per barrel by mid September 2008. In response to the drop in oil prices, OPEC announced on September 1, 2008 that it would reduce its oil production by 500,000 barrels per day.[4]

The data indicate, however, that the rise and in oil prices experienced since 2006 and recent fall in oil prices have not been driven primarily by a reduction in world supplies, but reflects a number of factors, including the slow-paced growth in oil production and an increase in demand, most notably among the developing countries, that has outpaced the increase in supply. In addition, the decline in the international exchange value of the dollar likely reflects a number of factors, including a change in the demand for and supply of capital within the U.S. economy, the relative rate of return on interest-sensitive assets, and expectations about the performance of the U.S. economy. At the same, some observers have argued that oil market speculators have

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[1] CRS Report RL33521 *Gasoline Prices: Causes of Increases and Congressional Response,* by Carl E. Behrens.

[2] Merriman, Jane, Weak Dollar Central to Oil Price Boom, *Reuters*, September 26, 2007.

[3] OPEC is comprised of: Algeria, Angola, Ecuador, Indonesia, Iran, Iraq, Kuwait, Libya, Nigeria, Qatar, Saudi Arabia, UAE, and Venezuela.

[4] Reed, Stanley, How Real is OPEC's Production Cut? *BusinessWeek*, September 11, 2008.

played an important role in pushing up oil prices so quickly in 2008.[5] A report issued on September 11, 2008 by the Commodity Futures Trading Commission (CFTC), however, concluded that market speculators probably were not responsible for the rise in oil prices.[6]

While data on exchange rates and on oil prices do not support the case for a strong cause and effect relationship between the value of the dollar and the price of oil, there are a number of channels through which changes in the price of oil and changes in the value of the dollar may be indirectly correlated. In fact, an increase in the price of oil to offset the loss of purchasing power that is associated with a depreciation in the value of the dollar can spark a chain of events that could blunt or even nullify the rise in oil prices.

The pervasive nature of such commodities as oil, which serve as essential components in economic growth, means that changes in the prices of those commodities affect the prices of a broad range of goods, services, and economic activities.[7] Indeed, according to the Census Bureau, increases in the price of imported oil were a major factor in rising consumer prices in the United States in the first six months of 2008. Moreover, rising consumer and commodity prices undermine the exchange value of the dollar relative to other currencies and reduce the real incomes of consumers, which can lead to a lower rate of economic growth. Slower economic growth, in turn, lowers the demand for oil, thereby putting downward pressure on the price of oil.[8] Expectations about future economic growth and, therefore the demand for crude oil, also can affect a broad range of investment decisions that might affect expectations about the value of the dollar. The interaction between the price of oil and the value of the dollar is complicated further by the way changes in the price of oil can affect the economic performance of other nations and, therefore, have an impact on their respective currencies.[9]

According to Global Insight[10], a number of actors worked to put upward pressure on oil prices in 2007 and during the first half of 2008. These factors include both supply and demand issues as well as geopolitical troubles in various countries, particularly Nigeria and Iran, that created uncertainties in the market concerning the

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[5] Masters, Michael W., Testimony before the Committee on Homeland Security and Governmental affairs, United States Senate, May 20, 2008.

[6] Mufson, Steven, Speculators Did Not Raise Oil Prices, Regulator Says, *The Washington Post*, September 12, 2008, p. D1; *Staff Report on Commodity Swap Dealers & Index Traders With Commission Recommendations*, Commodity Futures Trading Commission, September 2008.

[7] CRS Report RL31608: *The Effects of Oil Shocks on the Economy: A Review of the Empirical Evidence*, by Marc Labonte.

[8] Clifford, Catherine, *Oil at 5-month Low on Shrinking Demand*. CNNMoney.com., September 5, 2008; Barr, Colin, *Why Cheaper Oil Signals Trouble*. CNNMoney.com. September 4, 2008.

[9] Dougherty, Carter, Fears of European Slowdown Weaken the Euro. *The New York Times*, August 9, 2008.

[10] *Market Analysis: Forecast Highlights*, Global Insight, July 1, 2008.

stability of oil supplies. A low rate of growth in oil supplies relative to a higher rate of growth in the demand for oil is cited as the most important market factor behind the rise in oil prices. Saudi Arabia agreed to increase its production of oil by 300,000 barrels per day in May 2008 and by an additional 200,000 barrels per day in July 2008. Also, price movements in the oil market may have been exaggerated somewhat by trading in the oil futures market, and other producers, especially non-OPEC producers, have not increased their supply as had been projected. On the demand side, continued strong growth in the demand for oil in Asia and the Middle East pushed the total demand for oil to rise at a pace that has been faster than the rise in supplies. Demand in the Middle East is rising at double-digit rates as a result of a boom in construction and oil consumption. In Asia, demand for oil has grown rapidly in China, where until recently the government was subsidizing the price of oil to consumers and the government was stockpiling oil to use as substitute for coal in the Beijing area during the Olympics to reduce the level of air pollution.

The Dollar and the Price of Oil

For many observers, there seems to be a direct cause and effect relationship between the depreciation in the international exchange value of the dollar and the rise in the price of oil. These observers argue that because oil is priced in dollars, a depreciation in the international exchange value for the dollar against other major currencies erodes the purchasing power of oil producers. The International Monetary Fund (IMF) has identified three channels through which a change in the value of the dollar can affect a broad range of commodity prices, including the price of oil. A change in the value of the dollar can affect commodity prices through: 1) purchasing power and cost channels; 2) asset channels in which changes in the value of the dollar affect the return on dollar-denominated financial assets; and 3) a combination of effects, including changes in monetary policy.[11] As a result of these three effects, the IMF also estimates that among various commodities, the linkage between changes in the value of the dollar and changes in commodity prices is especially strong for oil and gold, because they are more suitable as a "store of value," or as a hedge against inflation.[12] One explanation for this relationship is that oil market participants and speculators may have adopted a rough rule of thumb over time concerning changes in the value of the dollar and subsequent changes in the price of oil and vice versa. As a consequence the statistical relationship between the two has been strengthened, because market participants have acted on this informal rule.

The past actions of OPEC oil producers may also have tended to strengthen the apparent linkage between changes in the value of the dollar and changes in the price of oil as the producers have acted in concert to adjust their output in order to alter the world price of oil. OPEC accounts for just over 40% of the world output of crude oil, and the coordinated actions of its members can affect world oil prices. In addition, one of OPEC's stated goals is to secure a "fair and stable price" for the oil the

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[11] *World Economic Outlook*, the International Monetary Fund, April 2008. P. 46-50.

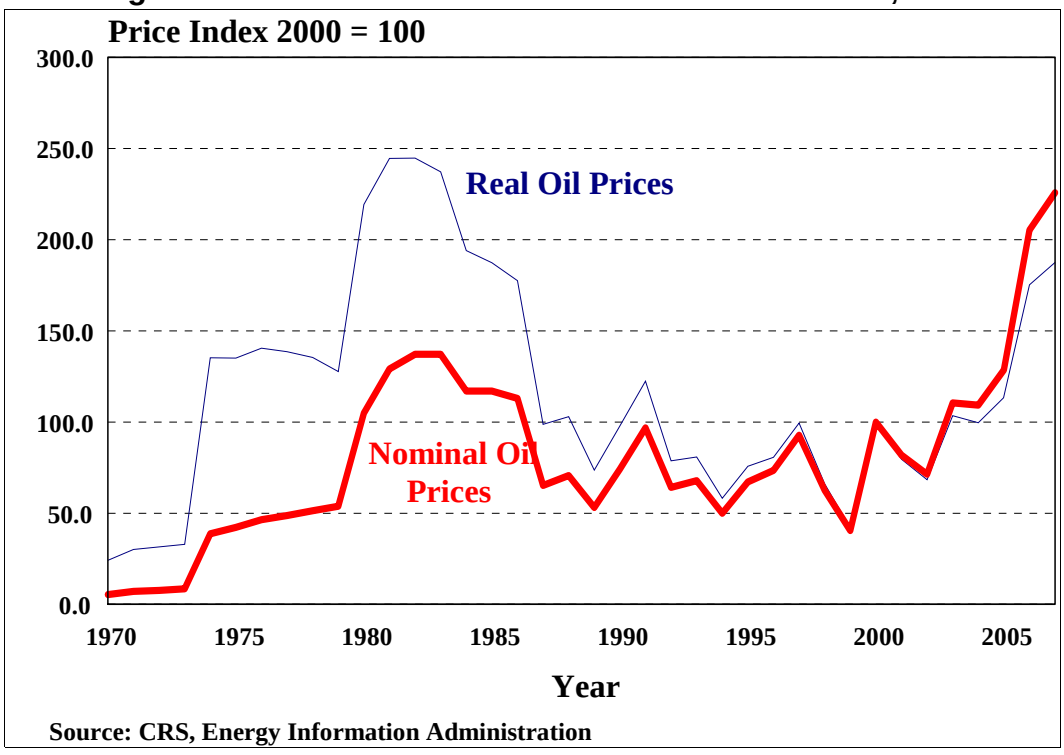
[12] The IMF estimates that a 1 percent real depreciation in the value of the dollar would result in an increase of greater than 1 percent in the price of oil over two years. *Ibid*., p. 50.

member countries produce, it is not unreasonable to assume that OPEC members would respond to a loss in the purchasing power of the dollar by reducing their overall level of production, or holding down the rate of increase in production in order to raise the market price of oil.[13]

Real and Nominal Oil Prices

Figure 1 shows indexes of the nominal and real (adjusted for inflation) indexes of the price of crude oil from 1970 to 2007. The figure shows the 1973 and 1979 price increases and the slide in the real price of oil between 1980 and 1999. The indexes show the stark rise in real oil prices in the 1970s as OPEC oil producers pushed up crude oil prices. Over the next decade, however, real prices slowly moved downward to more moderate levels, due in part to an increase in crude oil production by non-OPEC producers. Naturally, nominal prices increased in the 1970s as a result of the rise in oil prices, but nominal prices rose at a slower pace than real prices as national governments focused economic policies on constraining inflation. Both real and nominal oil prices began rising in 1999 as a result of an agreement signed in 1998 between OPEC members and such non-OPEC producers as Mexico, Norway, Oman, and the Russian Federation to reduce their supplies of oil. While OPEC's

Figure 1. Real and Nominal Crude Oil Price Indexes, 1970-2007



Source: CRS, Energy Information Administration

[13] According to standard economic theory, a reduction in the market supply of a good relative to a given level of demand will result in a higher market price for the good since the market demand would be chasing a smaller number of goods (supply), which would tend to bid up the market price of the good.

production of crude oil declined by about 4% in 1999 from that produced in 1998, production in 2000 increased by 6% to reach an average of 29.5 million barrels per day. From 2000 to 2002, OPEC's production of crude oil fell by about 9.5% to 26.8 million barrels per day. After 2002, OPEC's crude oil production has increased every year, reaching an average of 35.4 million barrels per day in 2007.

Data for the second quarter of 2008 likely will show an increase in the real price of crude oil above the peak reached in 1980. On an annual basis, the average price of oil, as measured by the spot price of Brent crude,[14] rose from $54.42 per barrel in 2005 to $72.47 per barrel in 2007, or an increase of 33% in nominal terms. In real terms, the price of oil rose at a slightly more modest 25% rate on an annual average basis from 2005 to 2007. During the same period, the dollar depreciated less than 7% in real terms as measured against a broad basket of currencies.[15] From January 2008 to May 2008, the real price of oil increased by another 30%, while the real broad dollar index depreciated by 1.2%. Against other major currencies, the dollar depreciated about 4% against the Euro in real, or price adjusted terms on average from 2005 to 2007 and about 3% in the January to May period in 2008. Relative to the Yen, the dollar appreciated about 1% between 2005 and 2007 in real terms, but depreciated about 6% against the Yen in the first four months of 2008. Against the British Pound, the dollar depreciated about 4% in real terms between 2005 and 2007, but gained about 3% in value in real terms in the first four months of 2008.

Major Currencies

Figures 2 through 5 display indexes of the dollar relative to other currencies in real terms and an index of the price of oil, also expressed in real terms, from the first quarter of 1999 through the first quarter of 2008. **Figure 2** shows the real broad dollar index, or an index of the dollar per a unit of a grouping of 26 currencies in real terms compared with an index of the real price of crude oil. A decline in the dollar index signifies a depreciation in the value of the dollar relative to the broad group of other currencies. The data cast doubt on the argument that the price of oil responded to offset the depreciation of the dollar. Compared with the currencies of the 26 largest U.S. trading partners, the dollar depreciated slightly in real terms, compared with a large increase in the real price of oil.

The devaluation of the dollar against the Euro since early 2006 also led some observers to speculate that oil producers would attempt to raise the price of oil to compensate for the devalued purchasing power of the dollar relative to the Euro and that a devalued dollar would be a disincentive for producers to explore and drill for new wells because of the loss of purchasing power. In addition, the devalued dollar makes oil cheaper for the euro-area countries and, therefore, oil consumption in the euro area should increase with an appreciation of the euro. The decline in the

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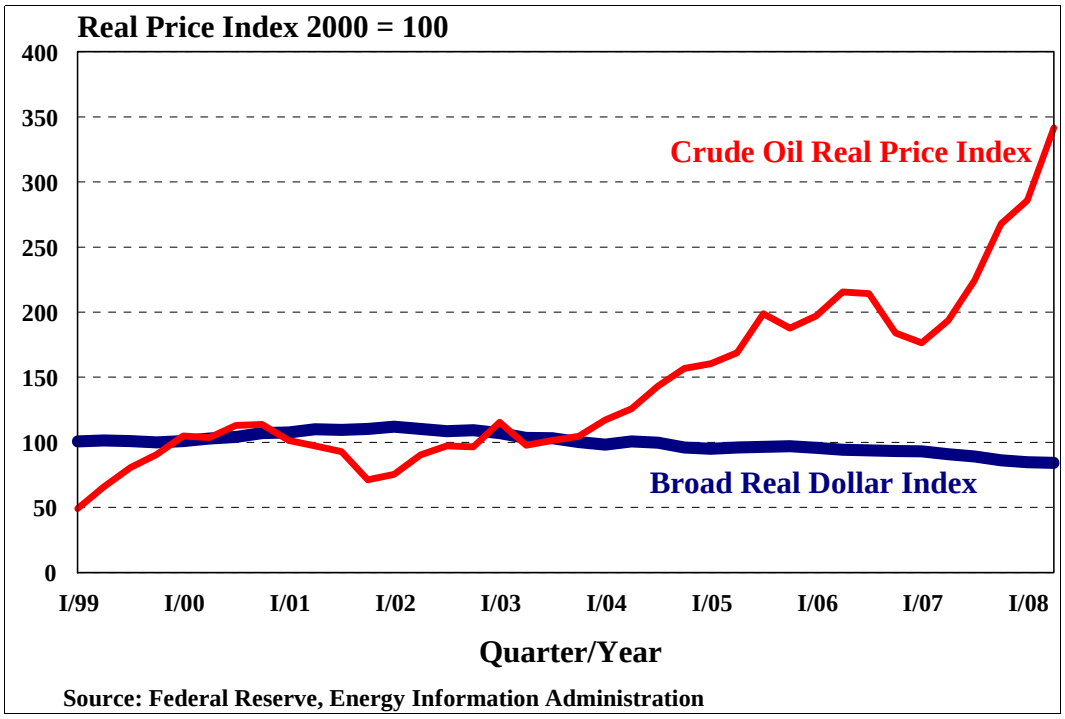
[14] Brent crude is the largest classification of crude oil. It is used to price two-thirds of internationally traded crude oil supplies.

[15] The broad dollar index is an index of the currencies of 26 largest U.S. trading partners weighted by the importance of the country as a trading partner. For additional information, see Loretan, Mico, Indexes of the Foreign Exchange Value of the Dollar, *Federal Reserve Bulletin*, Winter 2005. P. 1-8.

Figure 2. Crude Oil Real Price Index and Broad Real Dollar Index, 1999 - 2008



Source: Federal Reserve, Energy Information Administration

exchange value of the dollar relative also prompted some observers to argue that oil should be priced in a currency other than the dollar.

Data through 2007, however, do not support the contention that euro-area countries would increase their consumption of oil any faster than the United States due to the drop in the price of oil that resulted from an appreciation of the euro relative to the dollar. Also, after some initial adjustment, pricing oil in euros, or some other currency, rather than in dollars would appear to have no real effect on the demand and supply of oil in the market. Indeed, pricing oil in dollars facilitates the smooth functioning of the oil market, because the dollar is the most widely used currency in the world for pricing, or invoicing trade, which facilitates the cross-border comparison of goods and services.[16] **Figure 3** shows an index of crude oil prices in real terms and dollars per Euro in real terms, so that a rise in the dollar/Euro index signifies an appreciation in the Euro relative to the dollar, or a depreciation in the value of the dollar. The data supports the argument that any loss in oil producers' purchasing power arising from a depreciation in the value of the dollar relative to the Euro was offset by a larger increase in the price of oil, which may well provide an incentive to oil producers to expand their drilling and exploration activities.

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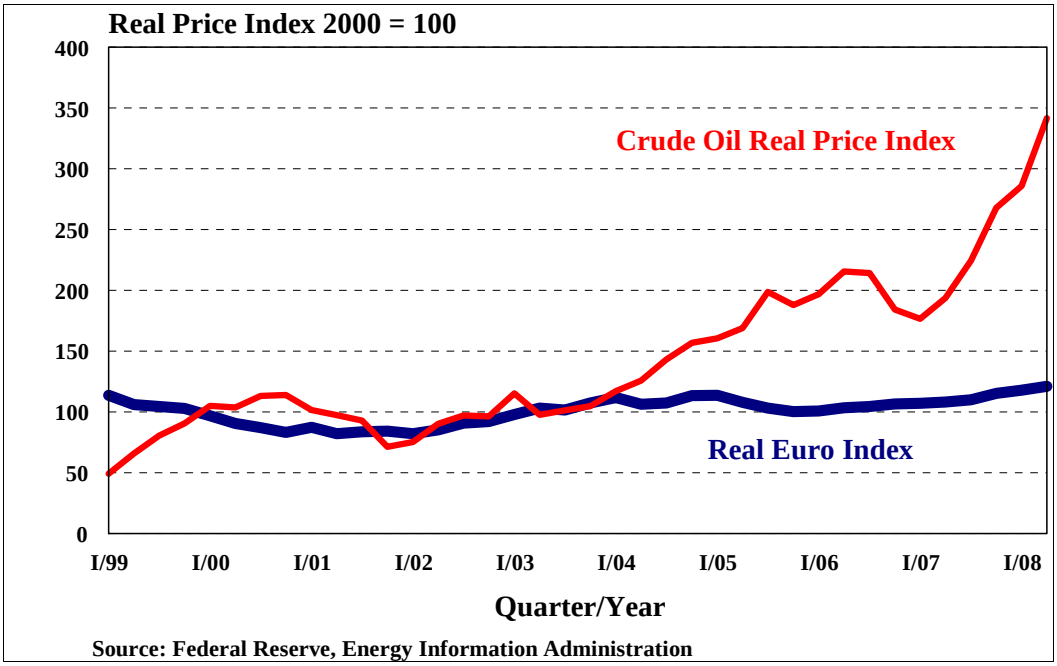
[16] Goldberg, Linda S., and Cedric Tille, *The International Role of the Dollar and Trade Balance Adjustment*, NBER Working Paper 12495, August 2006; and Goldberg, Linda S, and Cedric Tille, *Macroeconomic Interdependence and the International Role of the Dollar*, NBER Working Paper 13820, February 2008.

Figure 3. Crude Oil Real Price Index and Real Dollar/Euro Index, 1999-2008



Similar trends are seen in movements in the value of the dollar relative to the Yen and the British Pound. **Figure 4** shows the index of the Yen per dollar exchange rate, expressed in real terms and the index of the real price of crude oil. In this figure, a decline in the index indicates an appreciation in the value of the Yen relative to the dollar, since fewer Yen are required to buy a dollar. **Figure 5** shows the index for dollars per Pounds expressed in real terms and the index for real crude oil prices. In this case, a rise in the dollar/Pound index indicates an appreciation in the value of the Pound, since more dollars would be required to purchase a Pound. In both cases, the relative movement in the real prices of foreign currency against the dollar has been small relative to the increase in the real price of crude oil since 2004.

The Price of Oil

As indicated previously, the OPEC cartel of oil producers has acted in concert on occasion to alter the supply of oil in the market in order to affect the price of oil and, therefore, the export earnings of its members. In practice, OPEC oil producers, or other oil producers for that matter, do not attempt to set the price of oil directly, but attempt to alter the supply of oil in the market relative to a given level of expected demand and then rely on the market to search out the corresponding price. The price of oil, then, reflects the actual level of demand and supply in the market, which is reflected in the spot, or current, market, and the price of oil is affected by expectations about demand and supply conditions and about production capacity, reflected in the futures market. In addition, during times of economic instability, investors may well trade such commodities as oil that they calculate will generate a

return on their investment that exceeds such traditional financial investments as stocks, bonds, or government securities.

Figure 4. Crude Oil Real Price Index and Real Yen/Dollar Index, 1999-2008

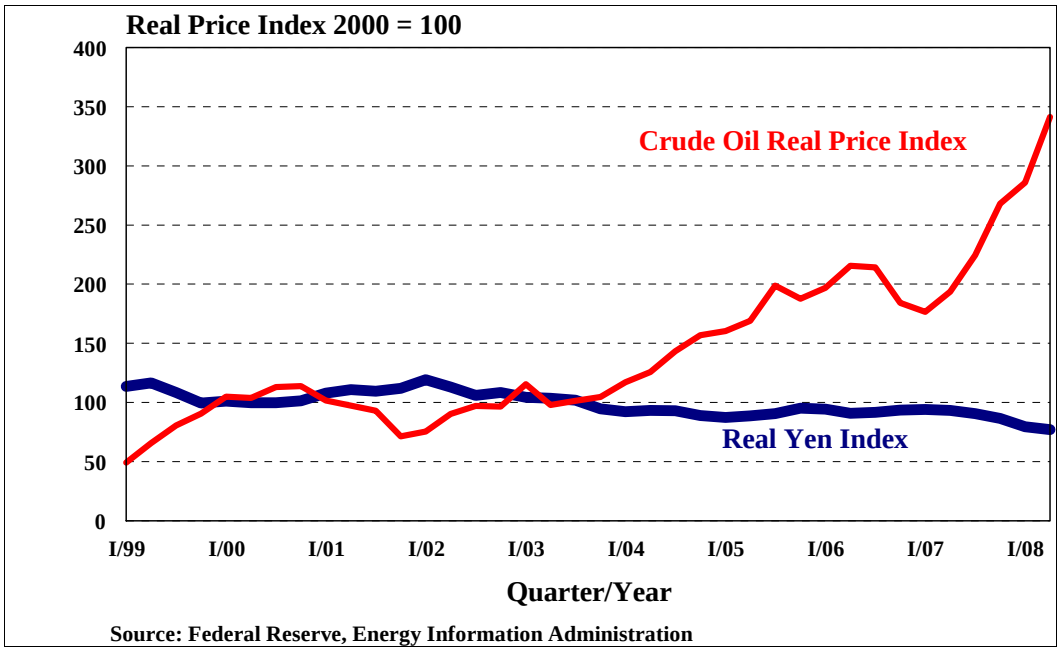
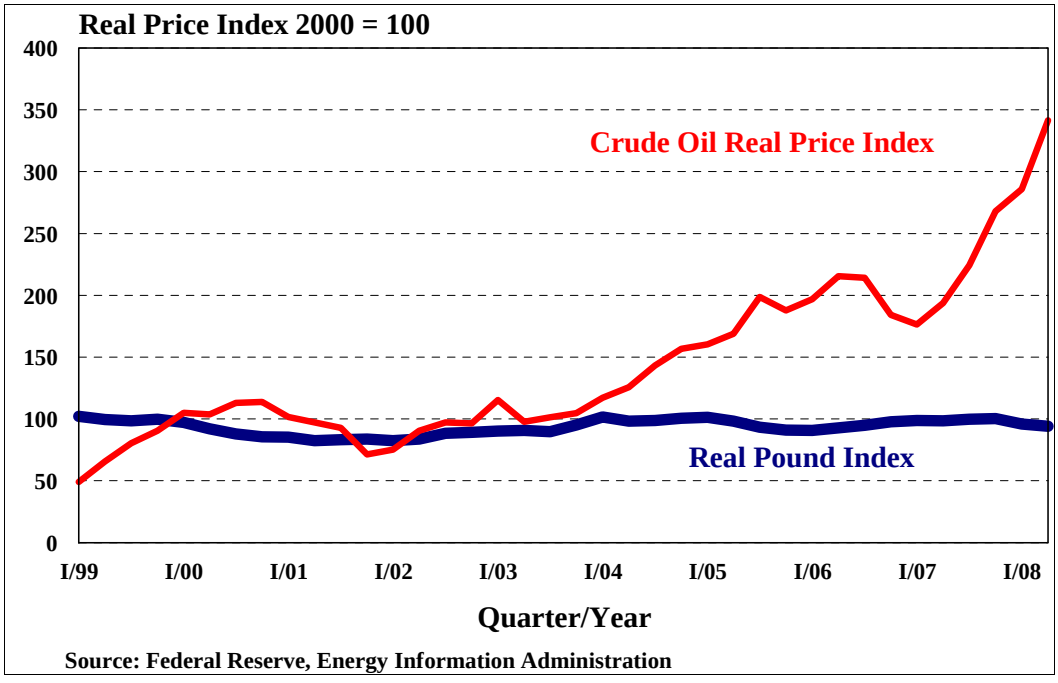


Figure 5. Crude Oil Real Price index and Real Dollar/Pound Index, 1999-2008



Oil Exchanges

Similar to other commodities, oil is traded on specialized commodities exchanges. Most of this trading is conducted by licensed brokers, who act on behalf of clients to buy and sell oil on the spot market and in the futures and options markets.[17] The major futures exchanges for oil are the Intercontinental Exchange, located in London, which acquired the International Petroleum Exchange in 2001, and the New York Mercantile Exchange (NYMEX). The New York Exchange states that it is the world's largest physical commodity futures exchange. The NYMEX operates on the bid-ask system in which buy and sell transactions are executed between floor brokers. In this process, buyers compete with each other by bidding up prices and sellers compete by bidding prices down. Such markets are identified as price discovery markets, because the price of the futures contract is determined through open bids. Futures contracts are firm commitments to make or accept delivery of a specified quantity and quality of a commodity during a specified month in the future at a price agreed upon at the time the contract is made. In the commodities exchanges, futures contracts are traded in standardized units in a highly visible, extremely competitive continuous open auction. The NYMEX reports that less than 1% of all oil futures contracts take physical delivery, the remainder are settled by cash payments.

Although relatively little physical quantities of oil change hands in futures markets, the markets serve as important sources of information about market conditions and provide mechanisms for determining the price of oil in the global energy market. As a result, oil prices that are determined in the futures market are useful in at least three ways.[18] First, since the futures markets are conducted in full public view, a broad assortment of traders, including producers, commercial users, speculators, and financial institutions, make financial and production decisions based on the prices that are determined in the those market. Second, the prices that are generated in the futures markets are publicly available and are used as reference points for physical trades in oil. Third, because the markets are conducted on a bid-ask system with floor brokers, the prices react quickly to new information about the supply and demand factors that are expected to influence the price of oil.

Futures and options contacts are used by both buyers and sellers to reduce the risks inherent in trading commodities.[19] Factors that might cause an abrupt change in supply, demand, and price such as international politics, war, changing economic patterns, and structural changes within the energy industry have created uncertainty about market conditions. Such uncertainty, in turn, leads to volatility in the market and creates risk for the market participants. The futures price, then, represents the current market opinion of what the commodity will be worth at some time in the future. Since the future price of a commodity can not be known with any certainty, buyers and sellers attempt to lock in prices and profit margins in advance through the

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[17] For additional information, see CRS Report RL34555 *Speculation and Energy Prices: Legislative Responses*, by Mark Jickling.

[18] CRS Report RS22918, *Primer on Energy Derivatives and Their Regulation*, by Mark Jickling.

[19] *A Guide to Energy Hedging*. New York Mercantile Exchange.

use of futures and options contracts in order to hedge, or to reduce, their risks. The purpose of the hedge is to avoid the risk of an abrupt change in market conditions and prices that could result in major losses for buyers and sellers.

Since the spot price and the futures market price do not have a perfect relationship, there will always be the potential for some profit or loss. Hedging, then, reduces exposure to risk for a buyer or a seller by shifting part of the risk associated with the market price of a commodity to investors who are willing to accept the risk in exchange for a profit opportunity. As indicated above, most traders do not take physical delivery of the commodities they are trading, but hope to profit by correctly anticipating future price trends, which some observers argue has been a factor in driving high and volatile prices. Concerns over the impact of such trading on the oil market spurred a number of legislative proposals during the 110th Congress.[20]

Unlike a futures contract, an options contract conveys a right, but not an obligation, to engage in a transaction. There are two types of options, calls and puts. A call conveys the right, but not the obligation, to the one holding the option to purchase the underlying futures contract at a specified price up to a certain time. A put gives the owner of the option the right, but not the obligation, to sell the underlying futures contract at a specified price up to a certain time. A call is purchased when investors anticipate a rise in prices and a put is bought when investors expect neutral or falling prices. When options are used in combination with futures contracts, investors can develop strategies that cover virtually any risk profile, time horizon, or cost consideration.

Oil Demand and Supply

The data in **Table 1** show the world demand and supply of petroleum in millions of barrels a day on average by major area from 2003 through 2007, including the four quarters of 2007. As indicated in **Figure 6**, between 2003 and 2007, the demand, or consumption, for oil among all consumers increased by 7.3%, rising from an average of 79.61 million barrels per day in 2003 to an average of 85.38 million barrels per day in 2007. The developed economies, represented by the members of the Organization for Economic Cooperation and Development (OECD),[21] accounted for about 60% of world demand for oil. These developed economies increased their demand for oil by 0.7% between 2003 and 2007, with U.S. demand rising by 3.3%. During the same period, demand for oil among European OECD countries fell by 1%. In addition, from 2006 to 2007, when the euro was appreciating against the dollar, demand for oil among the European OECD countries fell by more than 2%, while demand for oil in the United states grew by nearly 2%. Although demand for oil in China started from a low base, such demand over the 2003-2007 period increased by 35.9%, leading a 17.5% increase in the demand for oil among developing countries.

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[20] *Ibid.*

[21] For additional information about the OECD, see CRS Report RS21129, *The Organization for Economic Cooperation and Development*, by James K. Jackson.

Table 1. World Oil Demand and Supply, 2003-2007
(Million Barrels Per Day)

	2003	2004	2005	2006	2007	2007			
	Annual Average					Quarter			
						1st.	2nd.	3rd.	4th.
Petroleum (Oil) Demand									
OECD									
United States	20.03	20.73	20.80	20.69	20.70	20.77	20.65	20.70	20.68
Europe OECD	15.44	15.48	15.61	15.63	15.28	15.20	14.92	15.39	15.61
Total OECD	48.60	49.36	49.66	49.34	48.95	49.48	48.04	48.59	49.70
Non-OECD									
China	5.58	6.44	6.72	7.20	7.58	7.33	7.52	7.59	7.87
Former U.S.S.R.	3.91	4.04	4.07	4.21	4.28	4.25	4.32	4.22	4.32
Other Non-OECD	21.52	22.49	23.20	23.88	24.58	24.30	24.60	24.67	24.74
Total Non-OECD	31.01	32.97	33.99	35.29	36.43	35.88	36.44	36.48	36.93
Total World Demand	79.61	82.33	83.65	84.62	85.38	85.35	84.48	85.07	86.62
Petroleum (Oil) Supply									
OECD									
United States	8.80	8.70	8.32	8.33	8.48	8.43	8.53	8.40	8.56
Other OECD	14.46	14.11	13.56	13.26	12.93	13.32	12.97	12.66	12.80
Total OECD	23.25	22.81	21.88	21.59	21.42	21.74	21.50	21.07	21.36
Non-OECD									
OPEC	31.88	34.45	36.09	35.83	35.41	34.97	35.06	35.43	36.17
Former U.S.S.R.	10.43	11.35	11.77	12.16	12.61	12.61	12.60	12.55	12.66
Other Non-OECD	14.06	14.52	14.89	15.02	15.11	14.80	15.15	15.27	15.23
Total Non-OECD	56.36	60.31	62.75	63.01	63.13	62.38	62.81	63.25	64.06
Total World Supply	79.62	83.12	84.63	84.60	84.55	84.12	84.31	84.32	85.42
Difference (demand less supply)	0.003	0.794	0.982	-0.024	-0.837	-1.23	-0.172	-0.746	-1.200

Source: *International Petroleum Monthly*, May, 2008. Energy Information Administration. Table 2.1.

Figure 7 shows that world oil supplies increased by 6.2% over the period from 2003 to 2007, or by less than the increase in the world demand for oil. During this period, oil supplies provided by U.S. producers and oil producers in other developed countries fell by 3.6% and 7.9%, respectively. During the same period, OPEC producers increased their supply of oil by 11.4% and oil suppliers from other developing countries increased their supplies by 12%. The shortfall between the

change in demand and the change in supply was met by oil that had been held in stocks elsewhere. The rising demand likely was an important factor in pushing up the price of oil in the market and likely affected the pricing expectations of oil brokers and traders in the futures market.

Figure 6. Change in Oil Demand by Major Area, 2003 to 2007

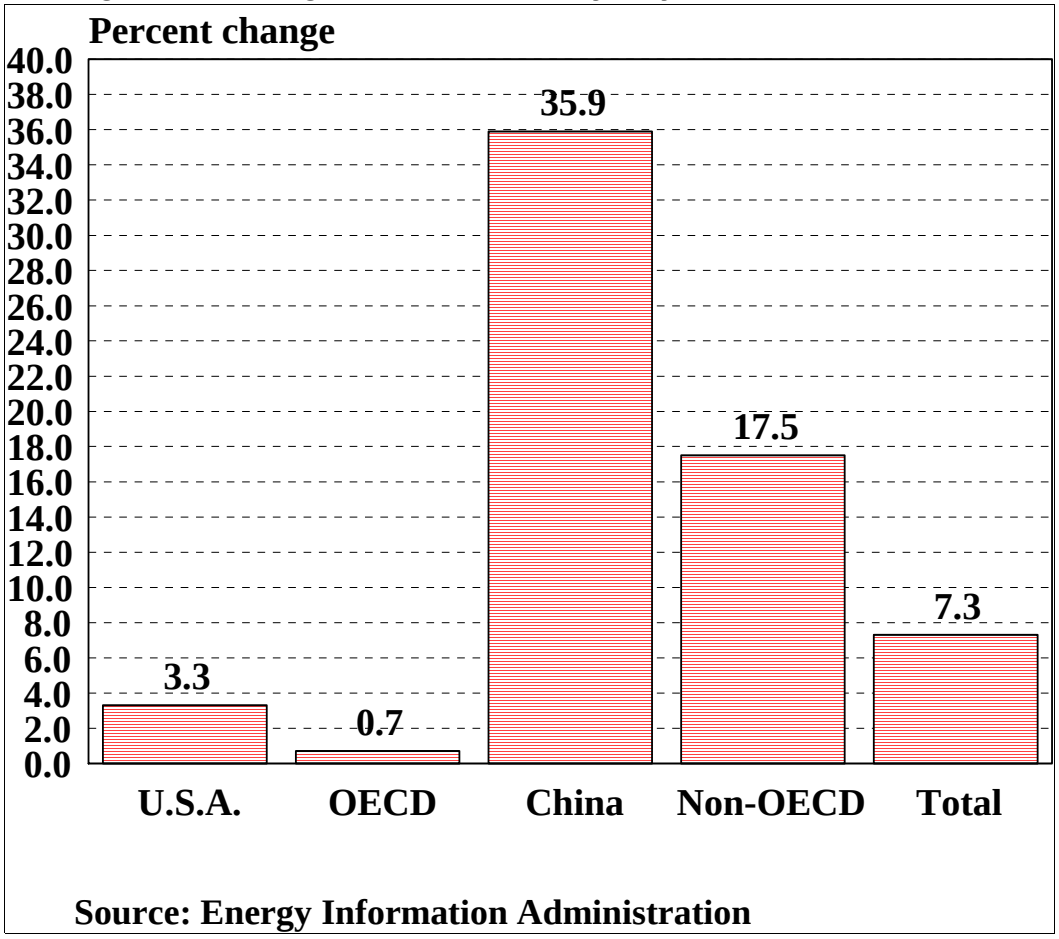
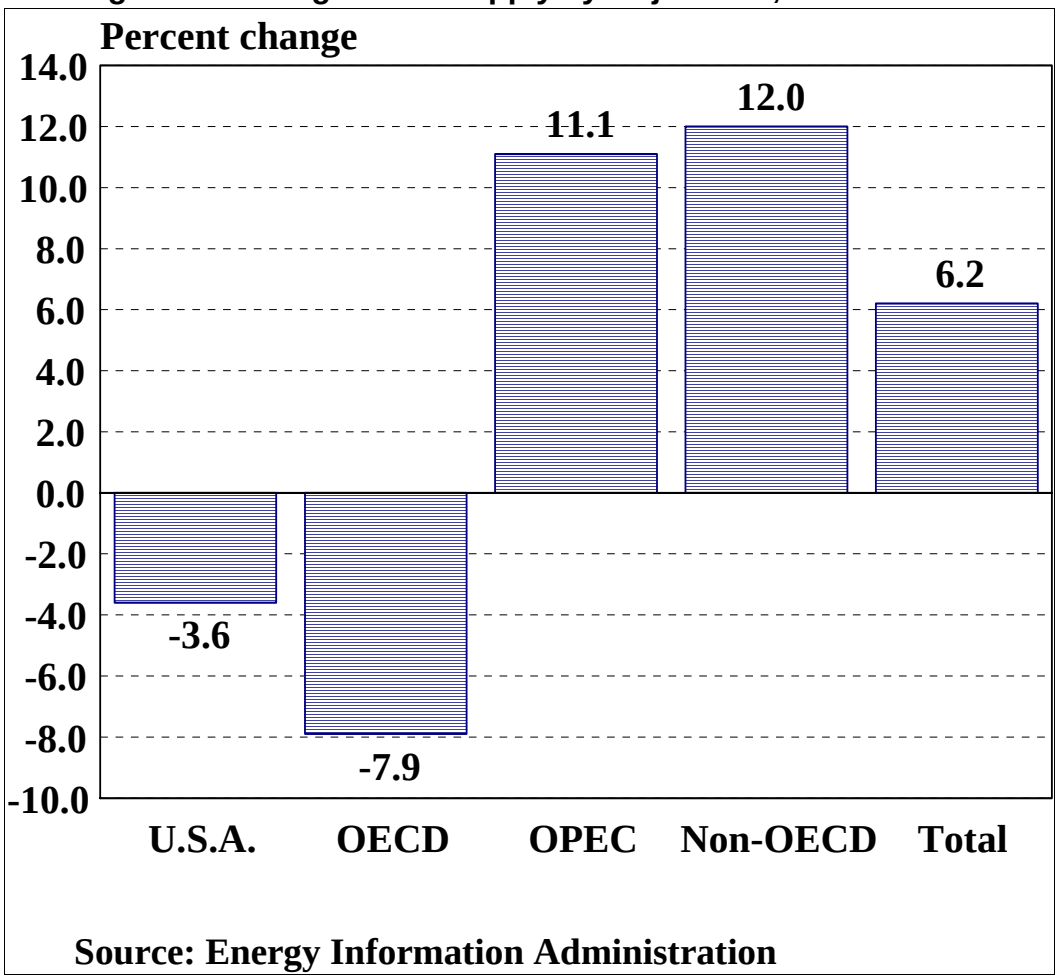


Figure 7. Change in Oil Supply by Major Area, 2003 to 2007



The International Exchange Value of the Dollar

Although attention has focused on the international exchange value of the dollar for many years, the depreciation of the dollar since 2006 has drawn particular attention. As previously stated, some observers have argued that the rise in the price of oil has occurred in part to offset the decline in the purchasing power of oil producers as a result of the depreciation of the dollar against other major currencies. According to standard economic theory, the international exchange value of the dollar is determined by a complex interplay of demand for and supply of goods and capital within the U.S. economy and the demand for and supply of dollars in international currency markets. While dollar-related transactions generally are independent of those transactions that determine the market price of oil, there may be channels through which movements in the price of oil and changes in the value of the dollar may have spillover effects. This is especially true for the price of oil, which has a far-ranging impact on the performance of the U.S. economy and on global flows of dollars. Over time, such a connection may have become more stylized in the minds of some observers who may link changes in the price of oil to changes in the value of the dollar and vice versa. Such global capital flows, in turn, are facilitated by liberalized international capital markets and floating exchange rates,

which greatly expand the amount of capital flows between countries. These flows also have sparked growth in the development and the use of financial instruments that are designed to ease the international trade of currencies and to provide investors, corporations, and financial services providers with a hedge against unpredictable changes in the value of currencies.

Capital Flows

Capital inflows also help bridge the gap in the United States between the amount of credit demanded and the domestic supply of funds. A shortfall in the domestic supply of credit relative to domestic demands for those funds tends to raise domestic interest rates and draws in capital from abroad. Those inflows, in turn, help to keep U.S. interest rates below the level they likely would have reached without the inflows. The necessity to attract capital inflows, however, has complicated the conduct of economic policy. As the Federal Reserve has lowered interest rates on credit in order to stimulate economic activity and stem a slowdown in the economy, the lower interest rates have blunted capital inflows as foreign investors have sought assets in other markets where relative interest rates are higher.

Capital inflows, however, do allow the United States to spend beyond its means, including financing its trade deficit, because foreigners have been willing to lend to the United States in the form of exchanging goods, represented by U.S. imports, for such U.S. assets as stocks, bonds, and U.S. Treasury securities. Such inflows put upward pressure on the dollar, because demand for U.S. assets, such as financial securities, translates into demand for the dollar, since U.S. securities are denominated in dollars. As demand for the dollar rises or falls according to overall demand for dollar-denominated assets, the value of the dollar changes. These exchange rate changes, in turn, have secondary effects on the prices of U.S. and foreign goods, which tend to alter the U.S. trade balance. In addition, an increase in the U.S. rate of inflation tends to undermine the value of the dollar relative to other currencies, which tends to shift demand from the dollar to other currencies. At times, foreign governments have intervened in international capital markets to acquire the dollar directly or to acquire Treasury securities in order to strengthen the value of the dollar against particular currencies.

U.S. Financial Balance

The most common way of measuring capital inflows is through the U.S. balance of payments accounts. According to standard economic theory, macroeconomic developments in the U.S. economy are the major driving forces behind the magnitudes of capital flows, because the macroeconomic factors determine the overall demand for and supply of credit in the economy. Naturally, these macroeconomic conditions can be affected by changes in the price of oil, or by changes in macroeconomic policies. To the extent that changes in the price of oil alter the basic savings-investment relationship in the economy, such price changes could have long-lasting impact on the economy and on the trade balance.

One way of viewing the interaction between capital inflows and the domestic demand and supply of funds is through the domestic flow of funds accounts. These accounts measure financial flows across sectors of the economy, tracking funds as

they move from those sectors that supply the capital through intermediaries to sectors that use the capital to acquire physical and financial assets.[22] **Table 2** shows the major accounts in the net flow of funds in the U.S. economy from 1996 to the first quarter of 2008, with the quarterly data for 2007 and 2008 representing quarterly values at annual rates. The net flows show the overall financial position by sector, whether that sector is a net supplier or a net user of financial capital in the economy. Since the demand for funds in the economy as a whole must equal the supply of funds, a deficit in one sector must be offset by a surplus in another sector.

Table 2. Flow of Funds of the U.S. Economy, 1996-2007
(in billions of dollars)

Year	Households	Businesses	Government			ROW
			Total	State and Local	Federal	
1996	175.2	19.8	-196.8	-1.2	-195.6	137.9
1997	47.4	-18.3	-116.6	-47.5	-69.1	219.6
1998	128.0	-45.7	64.8	48.8	16.0	75.0
1999	-132.7	-62.6	115.3	9.9	105.4	231.7
2000	-371.0	-82.9	252.5	54.5	198.0	476.3
2001	-494.4	-82.9	233.4	35.4	198.0	485.4
2002	-343.4	8.7	-382.6	-95.6	-287.0	501.7
2003	-101.8	30.3	-546.3	-70.4	-475.9	535.4
2004	-230.6	136.8	-468.6	-32.9	-435.7	554.4
2005	-741.0	-26.1	-413.1	-16.1	-397.9	773.3
2006	-656.9	-170.5	-338.8	-50.3	-283.0	829.3
2007	-188.0	-45.4	-353.3	-90.7	-284.0	677.4
I 2007	6.4	-57.9	-486.5	-95.7	-387.8	728.1
II 2007	-1,199.6	10.8	-130.2	-64.3	-65.9	621.4
III 2007	618.5	-86.9	-435.9	-84.8	-351.1	441.9
IV 2007	-177.8	-47.6	-449.5	-118.2	-331.3	918.2
I 2008	219.2	-90.9	-636.8	-162.7	-474.1	592.1

Note: negative values indicate a net inflow of funds, or that the demand for funds in that sector were greater than the supply of funds provided by that sector.

Source: Board of Governors of the Federal Reserve System, *Flow of Funds Accounts of the United States, Flows and Outstandings First Quarter 2008*, June 5, 2008.

Generally, the household sector, or individuals, provides funds to the economy, because individuals save part of their income, while the business sector uses those funds to invest in plant and equipment that, in turn, serve as the building blocks for

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[22] Teplin, Albert M., The U.S. Flows of Funds Accounts and Their Uses, *Federal Reserve Bulletin*, July 2001, pp. 431-441.

the production of additional goods and services. The government sector (the combination of federal, state, and local governments) can be either a net supplier of funds or a net user, depending on whether the sector is running a surplus or a deficit, respectively. The interplay within the economy between saving and investment, or the supply and uses of funds, tends to affect domestic interest rates, which move to equate the demand and supply of funds. Shifts in the interest rate also tend to attract capital from abroad, denoted by the rest of the world (ROW).

Starting in 1999, the household sector began dissaving, as individuals spent more than they earned. Part of this dissaving was offset by the government sector, which experienced a surplus from 1998 to 2001. As a result of the large household dissaving, however, the economy as a whole experienced a gap between domestic saving and investment that was filled with large capital inflows. Those inflows were particularly large in nominal terms from 2000 to 2006, as household dissaving continued and as government sector surpluses turned to historically large deficits in nominal terms. Such inflows kept interest rates below the level they would have reached without the inflows, but they put added pressure on the international exchange value of the dollar during that period.

In 2007, capital inflows fell by about $150 billion from the amount recorded in 2006. This drop in capital inflows reflected a sharp drop in household dissaving, a decrease in business sector dissaving and an increase in the deficits experienced by State and Local governments as a result of the slowing rate of growth in the U.S. economy. The decrease in capital inflows combined with the slowing rate of economic growth and concerns about the stability of the financial services sector likely placed downward pressure on the exchange value of the dollar, or a devaluation of the dollar. In the first quarter of 2008, the flow of funds data show a large drop in capital inflows on an annual basis from the rest of the world, from $918 billion in the fourth quarter of 2007 to $592 billion through the first quarter of 2008, which would put downward pressure on the value of the dollar. In addition, households turned from a dissaving of $178 billion in the fourth quarter of 2007 to a net saving of $219 billion in the first quarter of 2008, reflecting the impact of rising prices on reducing the real disposable income of households and concerns among households over the state of the economy.

Foreign Exchange Market

International factors also affect the value of the dollar. The dollar is heavily traded in financial markets around the globe and, at times, plays the role of a global currency. Disruptions in this role have important implications for the United States and for the smooth functioning of the international financial system. This prominent role means that the exchange value of the dollar often acts as a mechanism for transmitting economic and political news and events across national borders, including expectations about the performance of the economy and concerns about the impact of such supply factors as the rise in the price of oil. While such a role helps facilitate a broad range of international economic and financial activities, it also means that the dollar's exchange value can vary greatly on a daily or weekly basis as it is buffeted by international events.

A triennial survey of the world's leading central banks conducted by the Bank for International Settlements in April 2007 indicates that the **daily** trading of foreign currencies through traditional foreign exchange markets[23] totals more than $3.2 trillion, up sharply from the $1.9 trillion reported in the previous survey conducted in 2004, as indicated in **Table 3**. In addition to the traditional foreign exchange market, the over-the-counter (OTC)[24] foreign exchange derivatives market reported that daily turnover of interest rate and non-traditional foreign exchange derivatives contracts reached $2.1 trillion in April 2007. The combined amount of $5.3 trillion for daily foreign exchange trading in the traditional and OTC markets is more than three times the **annual** amount of U.S. exports of goods and services. The data also indicate that 86.3% of the global foreign exchange turnover is in U.S. dollars, slightly lower than the 88.7% share reported in a similar survey conducted in 2004.[25]

Table 3. Foreign Exchange Market Turnover

Daily averages in April 2007, in billions of U.S. dollars

	1992	1995	1998	2001	2004	2007
Foreign Exchange Market Turnover						
Instrument						
Spot transactions	$394	494	568	386	621	1,005
Outright forwards	58	97	128	130	208	362
Foreign exchange swaps	324	546	734	656	944	1,714
Reporting gaps	43	53	61	28	107	129
Total "traditional" turnover	820	1,190	1,490	1,200	1,880	3,210
Over the Counter Derivatives Market Turnover						
Foreign exchange instruments			97	87	140	291
Interest rate instruments			265	489	1,025	2,090
Reporting gaps			13	19	55	113
Total OTC turnover			375	575	1,220	2,090
Total market turnover	820	1,190	1,865	1,775	3,100	5,300
United States						
Foreign exchange turnover		244	351	254	461	664
OTC derivatives turnover			90	135	355	607
Total		244	441	389	816	1,271

Source: *Triennial Central Bank Survey: Foreign Exchange and Derivatives Market Activity in 2007*. Bank for International Settlement, September 2007.

[23] Traditional foreign exchange markets are organized exchanges which trade primarily in foreign exchange futures and options contracts where the terms and condition of the contracts are standardized.

[24] The over-the-counter foreign exchange derivatives market is an informal market consisting of dealers who custom-tailor agreements to meet the specific needs regarding maturity, payments intervals or other terms that allow the contracts to meet specific requirements for risk.

[25] *Triennial Central Bank Survey: Foreign Exchange and Derivatives Market Activity in 2007*. Bank for International Settlement, September 2007. pp. 1-2. A copy of the report is available at:[http://www.bis.org/publ/rpfx07.pdf]

The U.S. Trade Deficit

Rising oil prices add to the Nation's trade deficit and boost the rate of change in wholesale and consumer prices, as long as the oil price increases are not offset by actions by the Federal Reserve to tighten the money supply.[26] According to data published by the Census Bureau of the Department of Commerce,[27] the prices of petroleum products over the past year have risen sharply, at times rising considerably faster than the change in demand for those products. As a result, the price increases of imported energy-related petroleum products worsened the U.S. trade deficit in 2006 and 2007, and will again in 2008. This rising cost added an estimated $50 billion to the nation's trade deficit in 2006 and another $28 billion in 2007.[28]

This rise in oil prices also increases the cost of a broad range of goods, services, and economic activities and lowers the real discretionary incomes of consumers, which reduces the rate of economic growth. In turn, a lower rate of economic growth reduces demand for oil and the price of oil falls to equate supply and demand, assuming that the supply of oil remains constant. The trade deficit also represents a transfer of wealth from the United States to the oil producers. This transfer of wealth reduces the real discretionary incomes of U.S. consumers. To the extent that the additional accumulation of wealth abroad is returned to the United States as payments for additional U.S. exports or to acquire such assets as securities or U.S. businesses, some of the negative effects could be mitigated. The data in **Table 4** provide estimates of the impact different prices for imported crude oil could have on the annual U.S. trade deficit. The table also provides estimates for the increase in the trade deficit if the amount, or the volume, of imported oil declines by 3% and 6% on an annual basis, as a result of lower demand for oil.

According to the Census Bureau, the United States imported 4.81 billion barrels of energy-related petroleum products in 2007. Energy-related petroleum products is a term used by the Census Bureau that includes crude oil, petroleum preparations, and liquefied propane and butane gas. Crude oil comprises the largest share by far within this broad category of energy-related imports. At an average price of $64.28 per barrel, imported petroleum products cost $318.82 billion dollars in 2007. After subtracting U.S. exports of petroleum products, the U.S. trade deficit in petroleum products was $293 billion, or 36% of the total trade deficit in 2007 of $819 billion. At an average price of $100 per barrel and assuming that the amount, or the volume, of petroleum products the United States imports does not change, the **addition** to the U.S. trade deficit that results from a rise in the price of petroleum products would be $162 billion, At an average price of $130 per barrel, the cost of imported petroleum would add $306 billion to the annual trade deficit. Naturally, should import volumes decrease as a result of greater energy conservation, the

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[26] *Consumer Price Index: June 2008*, The Bureau of Labor Statistics. P. 1.

[27] Census Bureau, Department of Commerce. Report FT900, *U.S. International Trade in Goods and Services*, July 11, 2008. Table 17. The report and supporting tables are available at [http://www.census.gov/foreign-trade/Press-Release/current_press_release/ftdpress.pdf].

[28] For additional information, see CRS Report RS22204 *U.S. Trade Deficit and the Impact of Rising Oil Prices*, by James K. Jackson.

addition to the annual trade deficit would be less. If import volumes fell by 3% at a time when the average price of imported petroleum products was $100 per barrel, the addition to the annual trade deficit would be $147.54 billion. This amount would be reduced further to $133 billion should import volumes fall by 6%.

Table 4. Estimates of the Addition to the U.S. Trade Deficit Associated With Various Prices for Crude Oil and Changes in Oil Import Volumes

	2007 (Actual values)		2008 Estimated values			
	Quantity (billions of barrels)	Value (billions of dollars)	Price per barrel			
Price per barrel		$64.28	$100.00	$110.00	$120.00	$130.00
Crude oil imports	3.69	$237.21	$369.06	$405.96	$442.87	$479.77
Total energy-related Petroleum Products imports	4.81	$318.82	$480.78	$528.86	$576.94	$625.02
Change in trade deficit (in $billions)			$161.96	$210.04	$258.11	$306.19
With 3 percent reduction in import volumes						
Crude oil imports			$357.99	$393.78	$429.58	$465.38
Total energy-related Petroleum Products imports			$466.36	$512.99	$559.63	$606.26
Change in trade deficit (in $billions)			$147.54	$194.17	$240.81	$287.44
With 6 percent reduction in import volumes						
Crude oil imports			$346.91	$381.60	$416.30	$450.99
Total energy-related Petroleum Products imports			$451.93	$497.13	$542.32	$587.51
Change in trade deficit (in $billions)			$133.11	$178.31	$223.50	$268.69

Source: *U.S. International Trade in Goods and Services May 2008*, Census Bureau. Estimates developed by CRS.

Conclusions

Despite common perceptions that there is a direct cause and effect relationship between changes in the international exchange value of the dollar and the price of oil, an analysis of recent data indicate that the rise in the price of oil is being driven by an increase in demand that is exceeding the increase in supply. Attempts by oil producers to raise the market price of oil in order to offset the loss of purchasing power of a depreciating dollar likely would find those efforts blunted partially or in whole by the repercussions of the rise in oil prices. Increases in oil

prices tend to push up prices among a broad range of goods, services, and economic activities due to the ubiquitous presence of oil as a source of energy. In addition, higher relative inflation tends to undermine the exchange value of the dollar relative to other currencies, devaluing the dollar relative to other currencies and reducing the purchasing power of the dollar. Domestically, rising prices reduce real incomes and lower the overall level of consumption. In turn, lower consumption reduces economic growth, which would tend to reduce the demand for oil and lead ultimately to a lower market price for oil.

The relationship between the dollar and the price of oil is complicated by the impact the price of oil can have on the rate of inflation and the rate of economic growth in the United States, the rate of economic growth and the rate of inflation in other countries, and effects on foreign currencies. For instance, rising oil prices not only raise the price of energy in the United States, but in countries around the globe. Rising prices, in turn, tend to undermine the purchasing power of national currencies. Depending on the level of domestic dependency on foreign oil, the impact of changes in oil prices can vary. Concerns over rising prices in Europe and the prospect of slowing economic growth in the Euro zone countries have tended to push down the exchange value of the Euro relative to the dollar.[29]

Upward pressure on the market price of crude oil also can come from market participants and investors who are bidding up the price of oil in an effort to invest in commodities that they calculate will generate a rate of return that exceeds that of traditional financial investments. With demand for crude oil rising faster than supplies, it is difficult for the market to determine what the future price of crude oil might be, which provides a climate that is susceptible to speculation, although there is no clear evidence that such speculation has been a major factor in the rise in crude oil prices since 2006.

Over the long run, a sustained increase in the price of energy imports could permanently alter the composition of the nation's merchandise trade deficit. Some of the impact of higher oil prices, however, could be offset if some of the dollars are returned to the U.S. economy through increased purchases of U.S. goods and services or through purchases of such other assets as securities or U.S. businesses. Some of the return in dollars likely will come through sovereign wealth funds (SWFs), or funds controlled and managed by foreign governments, as foreign exchange reserves boost the dollar holdings of such funds. Such investments likely will add to concerns about the national security implications of foreign acquisitions of U.S. firms, especially by foreign governments, and to concerns about the growing share of outstanding U.S. Treasury securities that are owned by foreigners. Over the long-run it is possible for the economy to adjust to the higher prices of energy imports by improving its energy efficiency, finding alternative sources of energy, or searching out additional supplies of energy. Increased pressure is already being applied to Congress to assist in this process.

The sharp rise in prices of energy imports experienced since early 2007 is increasing the U.S. rate of inflation, likely will have a slightly negative impact on the rate of economic growth in 2008, and will pose a number of policy issues for

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[29] Dougherty, Fears of European Slowdown Weaken the Euro.

Congress. A slowdown in the rate of economic growth in the United States will lessen the demand for energy imports and could help restrain the prices of energy imports. An important factor, however, will be the impact Atlantic hurricanes have on the production of crude oil in the Gulf of Mexico. Most immediately, higher prices for energy imports will worsen the nation's merchandise trade deficit, add to inflationary pressures, and have a disproportionate impact on the energy-intensive sectors of the economy and on households on fixed incomes.

For Congress, the increase in the nation's merchandise trade deficit could add to existing inflationary pressures and complicate efforts to stimulate the economy should the rate of economic growth slow down. In particular, Congress, through its direct role in making economic policy and its oversight role over the Federal Reserve, could face the dilemma of rising inflation, which generally is treated by raising interest rates to tighten credit, and a slowing rate of economic growth, which is usually addressed by lowering interest rates to stimulate investment. A sharp rise in the trade deficit could also add to pressures for Congress to examine the causes of the deficit and to address the underlying factors that are generating that deficit. In addition, the rise in prices of energy imports could add to concerns about the nation's reliance on foreign supplies for energy imports and capital inflows and add impetus to examining the nation's energy strategy.