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U.S. Trade Deficit and the Impact of Changing Oil Prices

James K. Jackson

Specialist in International Trade and Finance

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Summary

Imported petroleum prices fell from an average price of \$102 per barrel of crude oil in September 2013 to an average price of \$91 per barrel in December 2013 and \$90 per barrel in January 2014. Although this is far below the \$140 per barrel price reached in 2008, the cost of energy is one among a number of factors that likely restrained the rate of growth in the economy through much of 2013. The average price of an imported barrel of crude oil in the September-December 2013 period fell 10% during the period and average prices for the year were 4% below the average price per barrel in 2012. Similarly, the volume of oil imports in 2013, or the amount of oil imported, decreased by 10% from 2012. As a result, the value of imported crude oil in 2013 fell nearly 13% from the value in 2012.

In general, market demand for oil remains highly resistant to changes in oil prices and reflects the unique nature of the demand for energy-related imports. Turmoil in the Middle East was an important factor that caused petroleum prices to rise sharply in early 2011 and in 2012. Although prices for imported crude oil fluctuated somewhat throughout 2011, they averaged 30% higher than in 2010 and added about \$100 billion to the total U.S. trade deficit in 2011. Energy import prices in 2013 averaged 4% lower than they were in 2012, pushing down the price of energy to consumers by the end of the year. During the same period, the total volume of petroleum products imported by the United States in 2013 fell below that imported in 2012, reducing the overall cost of imported energy to the economy and the overall trade deficit. Oil futures markets in March 2014 indicated that oil traders expect crude oil prices to trend around \$85 per barrel by August 2014. During periods when oil prices have spiked above \$100 per barrel, some elements of the public pressured Congress to provide relief to households that are struggling to meet their current expenses. This report provides an estimate of the initial impact of the changing oil prices on the nation's merchandise trade balance.

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Background

According to data published by the U.S. Census Bureau of the U.S. Department of Commerce,¹ the average price of imported petroleum products in 2012 rose 1% over the same period in 2011 to reach an average price of \$101.07 per barrel. In 2008, petroleum prices reached nearly \$140 per barrel, before falling at a historic rate.² Generally, petroleum prices rise during the winter and spring months and then decline in the fall. Following the economic recession in 2009, however, average petroleum prices fell each month between August 2008 and February 2009, but then reversed course and rose by 85% between February and December 2009, climbing to nearly \$80 per barrel at times. In 2010, petroleum prices reached a peak average price of about \$77 per barrel in April before falling to around \$72 per barrel in July 2010. In December 2010, as the pace of economic growth increased, imported petroleum prices averaged nearly \$80 per barrel and continued to increase, reaching over \$112 per barrel at times in March, April, and May 2011. Petroleum import prices rose in 2012 to peak at an average monthly price of \$110 per barrel in April before falling to an average price of \$95 per barrel in December 2012. In 2013, oil prices averaged around \$97 per barrel, about 4% below the average price in 2012. In January 2014, imported oil prices averaged \$90 per barrel. Imported energy products, primarily crude oil, account for about one-fourth of the total annual U.S. energy consumption, measured in btus.³

Oil futures markets in March 2014 indicated that oil traders expected crude oil prices to trend around \$85 per barrel by August 2014. Turmoil in the Middle East, natural disasters, hurricanes, and droughts, however, could have a significant impact on the course of oil prices for the foreseeable future. As a result of changing petroleum prices, the price changes in imported energy-related petroleum products worsened the U.S. trade deficit in 2006-2008 and 2010-2011.⁴ Oil prices in 2013 averaged less than those in 2012; combined with a decline in the volume of oil imported, resulted in a decline in the role of energy imports in the nation's trade deficit from 40% of the overall deficit in 2012 to 33% in 2013. If the trends set in 2013 and January 2014 continue through 2014, lower crude oil prices combined with a lower quantity of imported crude oil could reduce the overall U.S. trade deficit by \$50 billion in 2014 from that recorded in 2013. *Energy-related petroleum products* is a term used by the U.S. 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.

In isolation from other events, lower energy prices tend to aid the U.S. economy by making it a more attractive destination for foreign investment. Such capital inflows, however, place upward pressure on the dollar against a broad range of other currencies. To the extent that the additions to the merchandise trade deficit are returned to the U.S. economy as payment for additional U.S. exports or to acquire such assets as securities or U.S. businesses, the U.S. trade deficit could be mitigated further.

¹ U.S. Department of Commerce, U.S. Census Bureau, Report FT900, *U.S. International Trade in Goods and Services*, Table 17, March 7, 2014. The report and supporting tables are available at http://www.census.gov/foreign-trade/Press-Release/current_press_release/ftdpress.pdf.

² For information about the causes of the run up in oil prices, see Hamilton, James, *Causes and Consequences of the Oil Shock of 2007-2008*, *Brookings Papers on Economic Activity*, Spring 2009.

³ *Monthly Energy Review*, U.S. Energy Information Administration, February 2014, p. 3.

⁴ For additional information about U.S. oil imports, see out-of-print CRS Report R41765, *U.S. Oil Imports: Context and Considerations*, by Neelesh Nerurkar, available upon request.

Summary data from the Census Bureau for the change in the volume, or quantity, of energy-related petroleum imports and the change in the price, or the value, of those imports for 2013 and 2014 are presented in **Table 1**. The data indicate that during 2013, the United States imported about 3.5 billion barrels of energy-related petroleum products, valued at \$352 billion. On average, energy-related imports for 2013 were down 7.7% in volume terms from the average amount in 2012 and cost 11% less than similar imports during 2012. These data demonstrate that U.S. demand for oil imports responds slowly to changes in oil prices. According to various studies, U.S. demand for oil is correlated more closely to U.S. per capita income than to changes in oil prices.⁵ Data for 2013 indicate that with the average price per barrel of oil of around \$101, U.S. imported petroleum costs fell by \$46 billion in 2013 from the amount recorded in 2012.

The data also indicate that in January 2014, the quantity of energy-related petroleum imports fell by 4.7% compared with the comparable period in 2013; crude oil imports in January 2014 fell by 1.6% from January 2013. Compared with January 2013, the average value of energy-related petroleum products imports fell by 8.2% in 2014, while the average value of crude oil imports fell by 5.7%.

As **Figure 1** shows, imports of energy-related petroleum products can vary sharply on a monthly basis. In January 2014, imports of energy-related petroleum products averaged about 256 million barrels per month, compared with an average of 261 million barrels per month in January 2013, or a decrease of 1.6%.

⁵ Hamilton, Causes and Consequences of the Oil Shock of 2007-2008; *World Economic Outlook*, Chapter 3, International Monetary Fund, April 2011. According to the IMF, for developed economies, a 10% increase in oil prices is estimated to result in a 0.2% decrease in oil consumption, but a 10% increase in income leads to a 6.8% increase in oil consumption.

Table I. Summary Data of U.S. Imports of Energy-Related Petroleum Products, Including Oil (not seasonally adjusted)

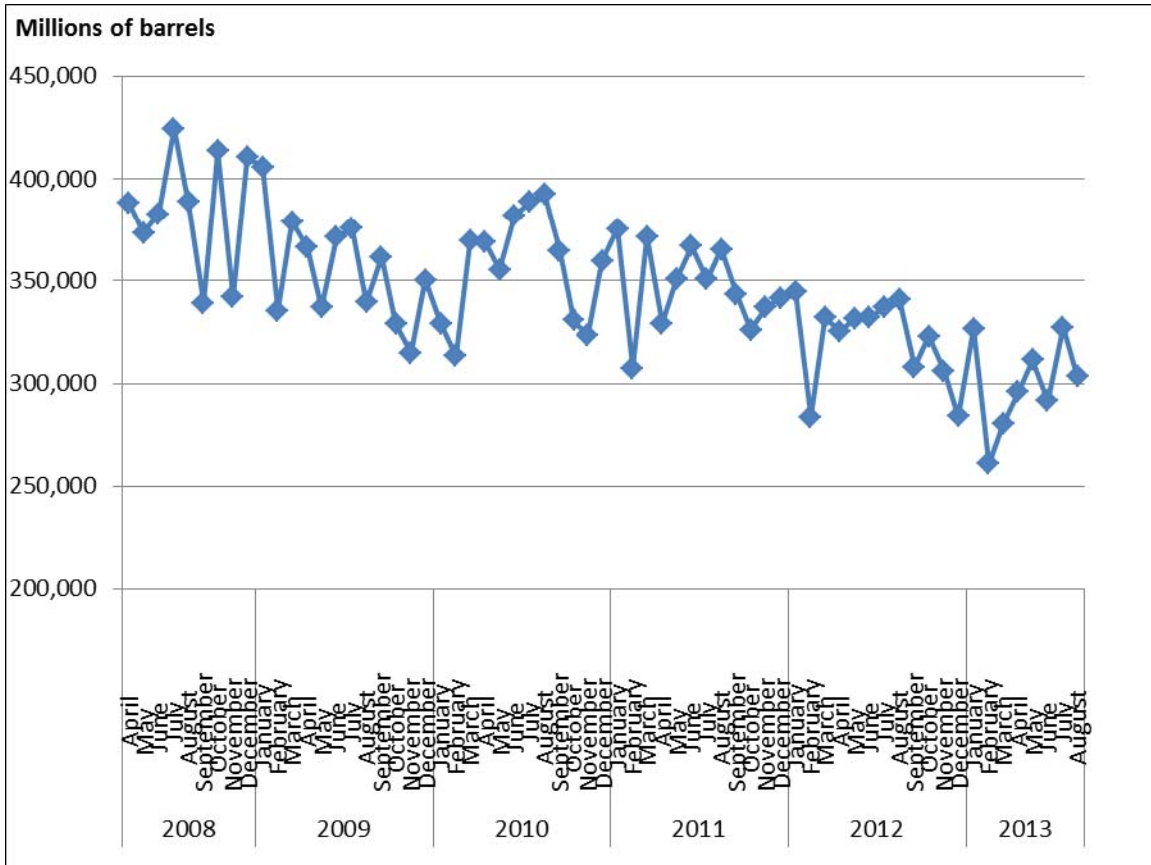
	January					
	2013		2014			
	Quantity (millions of barrels)	Value (\$ billions)	Quantity (millions of barrels)	% change 2011 to 2012	Value (\$ billions)	% change 2013 to 2014
Total energy-related petroleum products	326.8	\$31.7	311.6	-4.7%	\$29.1	-8.2%
Crude oil	260.7	\$24.5	256.5	-1.6%	\$23.1	-5.7%

	January through December					
	2013		2014			
	(Actual values)		(Estimated values)			
	Quantity (millions of barrels)	Value (\$ billions)	Quantity (millions of barrels)	% change 2013 to 2014	Value (\$ billions)	% change 2012 to 2013
Total energy-related petroleum products	3,544.6	\$351.7	3,379.5	-4.7%	\$322.7	-8.2%
Crude oil	2,808.7	\$272.5	2,763.2	-1.6%	\$257.1	-5.7%

Source: U.S. Department of Commerce, U.S. Census Bureau, Report FT900, *U.S. International Trade in Goods and Services*, Table 17, March 7, 2014.

Note: Estimates for January through December 2013 were developed by CRS from data in January, 2014, and data for 2013 published by the Census Bureau using a straight line extrapolation.

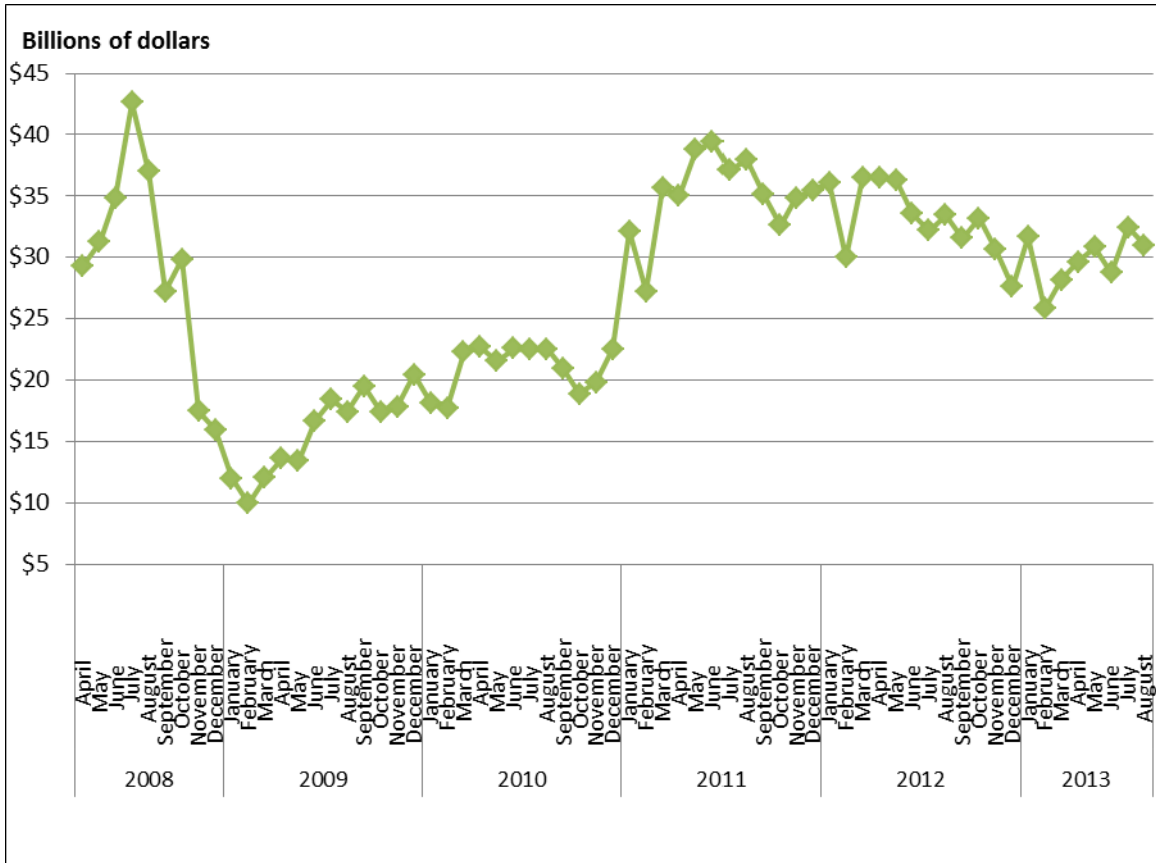
Figure I. Quantity of U.S. Imports of Energy-Related Petroleum Products



Source: U.S. Department of Commerce.

As indicated in **Table 2**, the dollar value of energy-related imports fell from a total value of \$397 billion in 2012 to \$352 billion in 2013, or a decrease of 11.4%, to account for about 16% of the value of total U.S. merchandise imports. In previous periods, energy prices rose sharply in 2007 and continued rising from January through July 2008, not following previous trends of falling during the winter months. The cost of U.S. imports of energy-related petroleum products rose from about \$17 billion per month in early 2007 to \$53 billion a month in July 2008, but fell to \$13.6 billion a month in February 2009, reflecting a drop in the price and in the volume of imported oil. As **Figure 2** shows, the average price of imported oil in January 2014 was \$90.21, down 4% from an average of \$94.08 in January 2013, and stands as the lowest average monthly value recorded since February 2011.

Figure 2. Value of U.S. Imports of Energy-Related Petroleum Products



Source: U.S. Department of Commerce.

As a result of the drop in the overall value of energy-related imports in 2009, the trade deficit in energy-related imports amounted to \$204 billion, down by nearly half from the \$386 billion recorded in 2008, and accounted for 40% of the total U.S. trade deficit of \$517 billion for the year. In 2011, the rise in oil prices, year over year, combined with a slight decrease in energy imports, pushed up the overall value of energy imports, which accounted for 44% of the total merchandise trade deficit. In 2012, the share of the U.S. trade deficit attributed to energy imports on an annual basis was 40%; the share in December 2012 was 33%, down from 42% recorded in December 2011. In 2013, the share of the U.S. trade deficit attributable to energy imports was at 33%, down from 40% in 2012.

Table 2. U.S. Imports of Energy-Related Petroleum Products, Including Crude Oil (not seasonally adjusted)

Period	Total energy-related petroleum products ^a		Crude oil			
	Quantity (millions of barrels)	Value (\$ billions)	Quantity (millions of barrels)	Thousands of barrels per day (average)	Value (\$ billions)	Unit price (dollars)
2013						
Jan.-Dec.	3,544.6	\$351.7	2,808.7	7,691	\$272.5	\$97.01

Period	Total energy-related petroleum products ^a		Crude oil			
	Quantity (millions of barrels)	Value (\$ billions)	Quantity (millions of barrels)	Thousands of barrels per day (average)	Value (\$ billions)	Unit price (dollars)
January	326.8	31.7	260.7	8,411	24.5	94.08
February	261.0	25.8	204.8	7,313	19.6	95.96
March	280.3	28.2	215.7	6,959	20.9	96.95
April	295.9	29.7	233.2	7,774	22.8	97.82
May	311.4	30.8	240.5	7,759	23.3	96.84
June	291.4	28.7	234.3	7,811	22.7	96.93
July	327.2	32.5	264.2	8,523	25.6	97.07
August	303.2	31.0	239.9	7,739	24.1	100.26
September	289.9	30.0	229.8	7,661	23.4	102.00
October	306.4	31.0	242.4	7,820	24.2	99.96
November	265.9	25.6	212.7	7,091	20.1	94.69
December	286.1	26.7	230.3	7,428	21.0	91.34
2014						
January	311.6	29.1	256.5	8,275	23.1	90.21

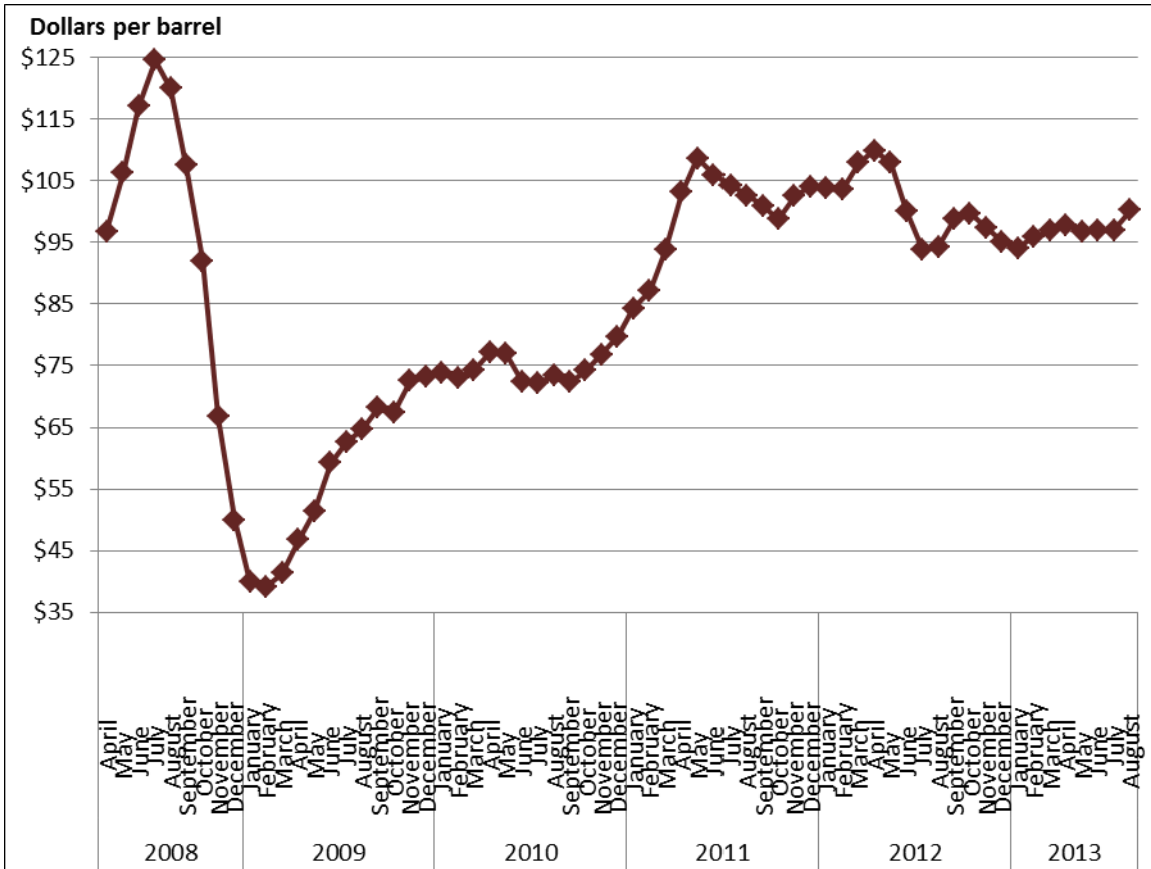
Source: U.S. Department of Commerce, U.S. Census Bureau, Report FT900, *U.S. International Trade in Goods and Services*, Table 17, March 7, 2014.

- a. "Energy-related petroleum products" is a term used by the Census Bureau and includes crude oil, petroleum preparations, and liquefied propane and butane gas.

Crude oil comprises the largest share of energy-related petroleum products imports. According to Census Bureau data,⁶ imports of crude oil fell from an average of 9.8 million barrels of crude oil imports per day in 2008 to an average of 9.1 million barrels per day in 2009, or a decrease of 7%, mirroring the sharp drop in economic activity. From January 2008 to June 2008, the average price of crude oil increased from \$84 per barrel to \$117 per barrel, or an increase of 39%. As a result, the value of U.S. crude oil imports rose from about \$27 billion a month in January 2008 to \$35 billion a month in June 2008. In 2011, crude oil imports averaged 277 million barrels per month at an average value of \$27.6 billion a month. Oil import prices in 2011 rose from about \$84 per barrel in January 2011 to an average of \$104.1 in December 2011. As shown in **Figure 3**, oil import prices rose steadily between September 2010 and May 2011, fell from June 2011 to October 2011, and then rose again through December 2011. In December 2012, imports of crude oil averaged 7.2 million barrels per day, or a decrease of 20% from the volume of such imports recorded in December 2011, and an increase of 1% over June 2012. Crude oil prices rose from an average of \$94 per barrel in January 2013 to \$102 per barrel in September 2013, the highest average monthly value recorded up to that point in 2013, but fell to an average imported price of \$91.34 in December 2013.

⁶ Report FT900, *U.S. International Transactions in Goods and Services*, Table 17, March 7, 2014.

Figure 3. U.S. Import Price of Crude Oil

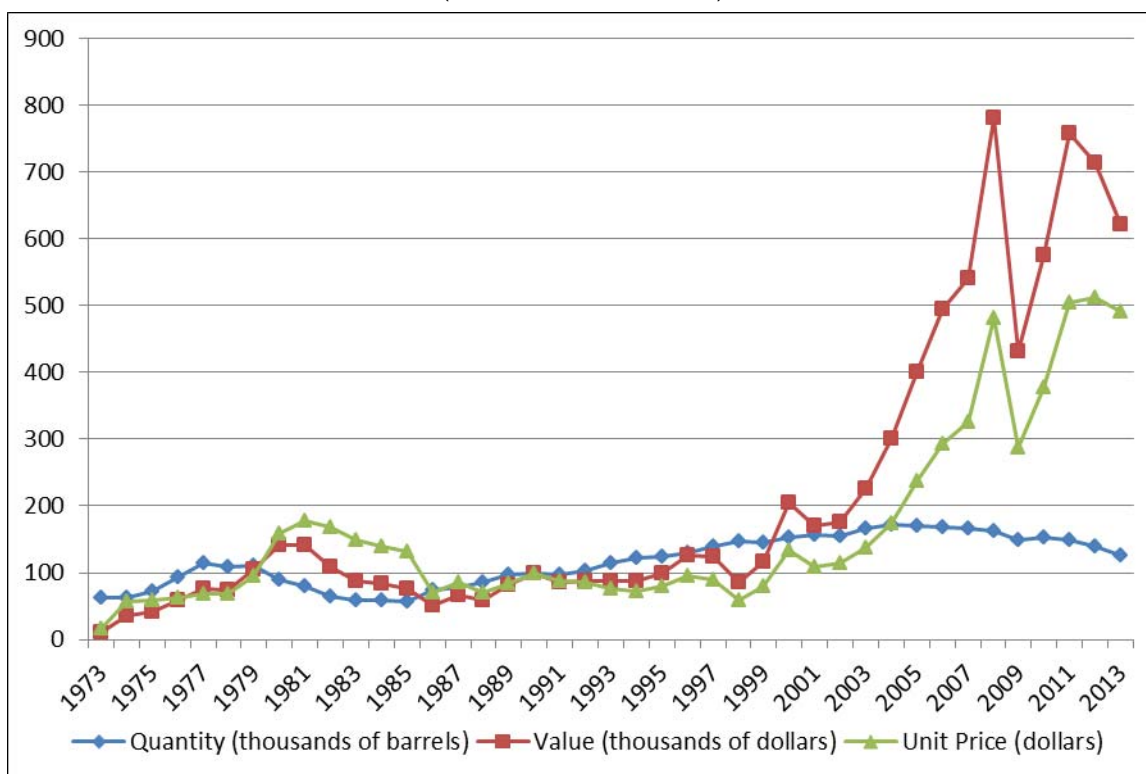


Source: U.S. Department of Commerce.

As previously indicated, the combination of changes in the volume, value, and prices of crude oil can have a large impact on the total value of U.S. imports and on the size of the U.S. trade deficit. **Figure 4** shows the annual amounts of the volume, value, and price of U.S. crude oil imports from 1973 to 2013, represented in index terms with 1990 as the base year. The data indicate that the overall volume of U.S. imports of crude oil increased by about 27% between 1990 and 2013 in index terms. The price of crude oil, represented by the average price of a barrel of crude oil on an annual basis, rose by five times between 1990 and 2013 in index terms. As a result, the total value of U.S. crude oil imports, representing the price per barrel times the number of barrels of crude oil on an annual basis, rose by over six times between 1990 and 2013 on an index number basis.

Figure 4. Quantity, Value, and Price of Imported Crude Oil by the United States, 1973-2013

(Index terms; 1990 = 100)



Source: U.S. Department of Commerce.

Data for 2008 and 2009 indicate that a number of factors, primarily the economic recession, had a large impact on pushing down oil prices in the first three months of 2009. As economic growth picked up, the higher demand for oil tended to raise pressure on oil prices, which rose through the end of the year. The rise in oil prices and an increase in the volumes of oil imports during the period combined to raise the overall cost of imported energy. At times, crude oil traded for nearly \$148 per barrel in July 2008, translating into higher imported energy costs that had a significant impact on the overall costs of U.S. imports and on the size of the U.S. trade deficit. Since those record prices, the price of imported crude oil fell to under \$40 per barrel at times in January and February 2009. For the year 2009, the imported volume of energy-related petroleum products fell by 44% compared with 2008, due in large part to a slowdown in economic activity. At an average price of \$56 per barrel in 2009, compared with an average price of \$95 per barrel in 2008, energy-related imports fell by nearly \$130 billion as a component in the overall U.S. trade deficit. For 2010, the total cost of energy imports rose to \$323 billion at an average price of \$75 per barrel and accounted for 41% of the annual trade deficit.

In 2012, at an average price of imported energy of about \$101 per barrel, the total cost of energy imports was \$397 billion, or about \$25 billion (5.8%) less than the cost of energy imports in 2011, thereby reducing slightly the contribution of energy-related products to the overall U.S. trade deficit. At the average price through January 2014, the contribution of energy imports to the overall trade deficit in 2014 could fall by \$50 billion from that recorded in 2013.

Issues for Congress

The fall in the prices of energy imports in 2013 compared with 2012, combined with a decrease in the total volume of energy imports resulted in a smaller contribution to the overall U.S. trade deficit in 2013. If the trend set in 2013 and January 2014, the contribution of energy imports to the overall U.S. trade deficit will fall by year-end 2014. The ubiquitous nature of oil in the economy generally means that changes in energy prices will affect the U.S. rate of inflation and the rate of economic growth. Various factors, dominated by events in the Middle East, a slowdown in the rate of economic growth in Asia and other developing economies, and increase in natural gas production in the United States combined in 2013 to push the cost of energy imports slightly lower than in 2012. The pace of economic growth was a bit erratic in 2013, which had an important effect on both the levels of oil imports and on the price of such imports. Typically, energy import prices have followed a cyclical pattern as energy prices rise in the summer months and fall in the winter. The slowdown in the rate of economic growth in the United States and elsewhere in 2009 sharply reduced the demand for energy imports and caused oil prices to tumble from the heights they reached in July 2008. An important factor that often affects crude oil prices is the impact Atlantic hurricanes have on the production of crude oil in the Gulf of Mexico and droughts in the mid-Western United States that can reduce the production of corn and, therefore, the availability of ethanol, which puts upward pressure on gasoline prices.

The return to a positive rate of economic growth in 2010 placed upward pressure on the prices of energy imports and contributed to the nation's merchandise trade deficit. Some of the impact of this deficit could be offset if some of the dollars that accrue abroad are returned to the U.S. economy through increased purchases of U.S. goods and services or through purchases of such other assets as corporate securities or acquisitions of U.S. businesses. Some of the return in dollars likely will come through sovereign wealth funds, 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.

Social turmoil in the Middle East created uncertainty in the oil markets in 2011 and into 2012 and was an important factor driving up oil prices. In 2013, slower-than-expected economic growth in various regions of the world reduced slightly the demand for oil and pushed down the average price of energy imports. Increased energy production in the United States also reduced the amount of energy imports, which may well have contributed to the forces that tended to draw down the price of energy on world markets. Higher prices for energy imports may have been one contributing factor in spurring the economy to improve its energy efficiency, find alternative sources of energy, or search out additional supplies of energy. For Congress, the nation's merchandise trade deficit could add to existing inflationary pressures and complicate efforts to reduce the government's budget deficit and to stimulate the economy should the rate of economic growth continue at a pace that is below its long-run potential. 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 slow rate of economic growth, which is usually addressed by lowering interest rates to stimulate investment. An increase in the trade deficit may 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 add impetus to examining the nation's energy strategy.

Author Contact Information

James K. Jackson
Specialist in International Trade and Finance
jjackson@crs.loc.gov, 7-7751