



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

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## Summary

Petroleum prices rose sharply between January 2012 and April 2012, at times reaching more than \$109 per barrel of crude oil. Although this is still below the \$140 per barrel price reached in 2008, the rising cost of energy was one factor that helped to dampen the rate of growth in the economy during the second half of 2011 and the first half of 2012. As the price of oil rose, the volume of oil imports, or the amount of oil imported, decreased slightly from the comparable period in 2011. 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. In addition, sustained demand for crude oil in the face of higher prices reflected an increase in economic activity that occurred following the worst part of the economic recession in 2009. 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. Oil futures markets in February 2013 indicated that oil traders expected prices to trend downward from the average per barrel price of \$95 recorded in December 2012 to around \$90 per barrel by the fall of 2013. On average, energy import prices in 2012 were slightly higher than they were in 2011, pushing up the price of energy to consumers. At times, 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 deficit.

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## Background

According to data published by the U.S. Census Bureau of the U.S. Department of Commerce,<sup>1</sup> 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.<sup>2</sup> 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 2012 before falling to an average price of \$95 per barrel in December 2012.

Oil futures contracts in February 2013 indicate that crude oil prices are expected to average \$88 to \$90 per barrel through the end of 2013, reflecting the prospect of a slow rate of economic growth in most geographic regions. 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.<sup>3</sup> Relatively steady prices in 2012, combined with a decline in the volume of oil imported resulted in a slight decline in the role of energy imports in the nation's trade deficit. *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 2009, the slowdown in the rate of growth in the U.S. economy reduced the amount of energy the country imported and helped push down world energy prices. Economic growth improved through 2010 and into the first half of 2011, driving up energy imports and energy prices. Although the pace of economic growth in the United States and Europe slowed in the last half of 2011, petroleum prices moderated only slightly. In isolation from other events, lower energy prices tend to aid the U.S. economy, which makes 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.

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 2011 and

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<sup>1</sup> U.S. Department of Commerce, U.S. Census Bureau, Report FT900, *U.S. International Trade in Goods and Services*, Table 17, February 8, 2013. The report and supporting tables are available at [http://www.census.gov/foreign-trade/Press-Release/current\\_press\\_release/ftdpress.pdf](http://www.census.gov/foreign-trade/Press-Release/current_press_release/ftdpress.pdf).

<sup>2</sup> 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.

<sup>3</sup> 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.

2012 are presented in **Table 1**. The data indicate that during 2011, the United States imported about 4.2 billion barrels of energy-related petroleum products, valued at \$421 billion. On average, energy-related imports for 2011 were down 2.7% in volume terms from the average amount in 2010 and cost an average of 30% more than similar imports during the same period in 2010. These data demonstrate that U.S. demand for oil imports is highly resistant 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.<sup>4</sup> Data for 2012 indicate that with the average price per barrel of oil of around \$101, U.S. imported petroleum costs fell by \$24 billion in 2012 from the amount recorded in 2011 to reach \$398 billion.

**Table 1. Summary Data of U.S. Imports of Energy-Related Petroleum Products, Including Oil (not seasonally adjusted)**

	January through December					
	2011		2012			
	Quantity (millions of barrels)	Value (\$ billions)	Quantity (millions of barrels)	% change 2010 to 2011	Value (\$ billions)	% change 2010 to 2011
Total energy-related petroleum products	4,165.0	\$421.4	3,848.2	-7.6%	\$397.5	-5.7%
Crude oil	3,324.3	\$331.7	3,094.2	-6.9%	\$313.0	-5.6%

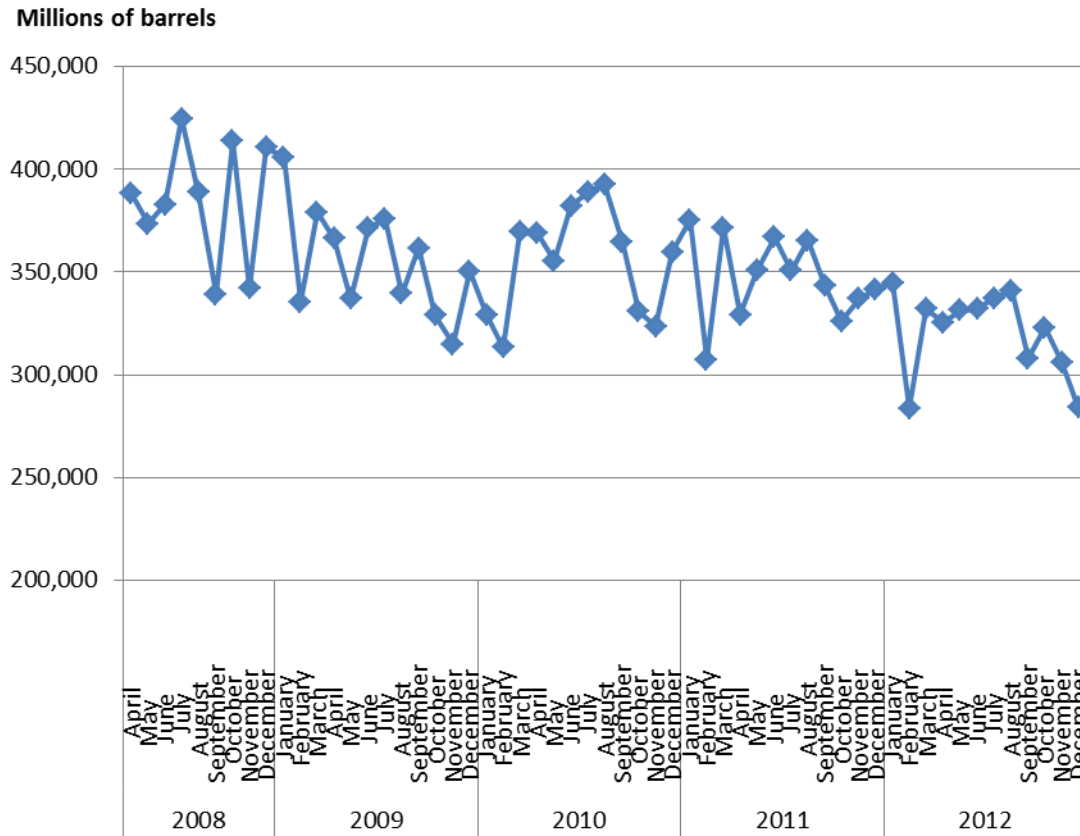
**Source:** U.S. Department of Commerce, U.S. Census Bureau, Report FT900, *U.S. International Trade in Goods and Services*, Table 17, February 8, 2013.

**Note:** Estimates for January through December 2012 were developed by CRS from data in January-July, 2012, and data through 2011 published by the Census Bureau using a straight line extrapolation.

The data also indicate that in 2011, the quantity of energy-related petroleum imports fell by 2.7% compared with the comparable period in 2010; crude oil imports fell by 1.6% from the same period in 2010. Year-over-year, the average value of energy-related petroleum products imports rose by 30% in 2011, while the average value of crude oil imports rose by 31.5%. In 2012, the quantity of energy-related petroleum imports fell 7.6% from the comparable period in 2011 as the pace of economic growth slowed. Crude oil imports fell by 6.9% from the amount imported in 2011. As **Figure 1** shows, imports of energy-related petroleum products can vary sharply on a monthly basis. In 2012, imports of energy-related petroleum products averaged about 320 million barrels per month, compared with an average of 347 barrels per month in 2011.

<sup>4</sup> 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.

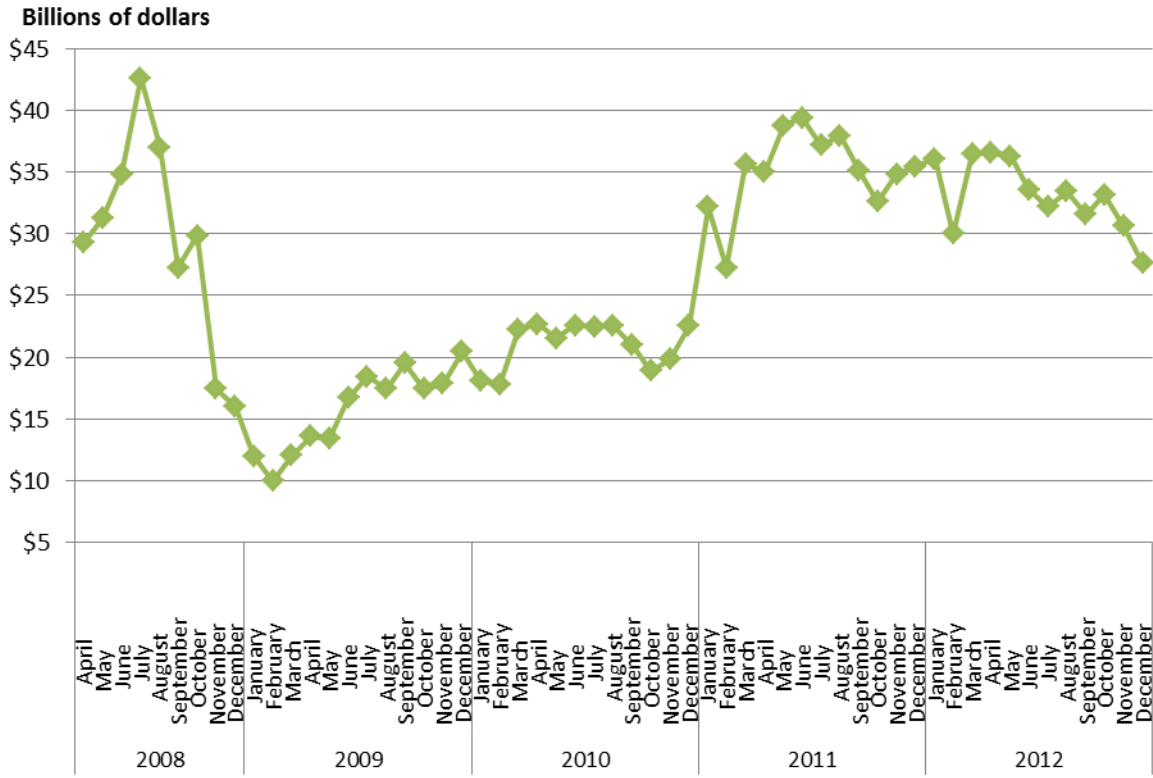
**Figure I. Quantity of U.S. Imports of Energy-Related Petroleum Products**



Source: U.S. Department of Commerce.

In value terms, energy-related imports fell from a total value of \$421 billion in 2011 to \$397 billion in 2012, or a decrease of 5.7%, to account for about 18% 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. The average price of imported oil in December 2012 was \$95.16, down 9% from an average of \$104.1 in December 2011 and down from the average price per barrel of \$103.9 in January 2012. As **Figure 2** shows, the value of total energy imports (reflecting the change in the amount of imports and the change in the price of those imports) in December 2012 fell 6% from January 2012 to about \$27 billion and down 8.6% from the value of total energy imports in December 2011, as indicated in **Table 2**.

**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 was 40%; the share in December 2012 was 33%, down from 42% recorded in December 2011.

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

Period	Total energy-related petroleum products <sup>a</sup>		Crude oil			
	Quantity (millions of barrels)	Value (\$ billions)	Quantity (millions of barrels)	Thousands of barrels per day (average)	Value (\$ billions)	Unit price (dollars)
<b>2011</b>						
Jan.-Dec.	4,165.0	421.4	3,324.3	9,108	331.7	99.78
January	375.3	32.2	290.7	9,376	24.5	84.34

Period	Total energy-related petroleum products <sup>a</sup>		Crude oil			
	Quantity (millions of barrels)	Value (\$ billions)	Quantity (millions of barrels)	Thousands of barrels per day (average)	Value (\$ billions)	Unit price (dollars)
February	307.3	27.2	242.4	8,656	21.1	87.17
March	371.4	35.7	295.1	9,520	27.7	93.76
April	329.2	35.0	252.2	8,408	26.0	103.18
May	350.7	38.8	275.3	8,879	29.9	108.70
June	366.8	39.4	296.7	9,889	31.4	106.00
July	350.9	37.2	281.1	9,067	29.5	104.27
August	365.4	38.0	302.5	9,757	31.0	102.62
September	343.6	35.1	280.1	9,338	28.3	101.02
October	325.9	32.6	263.2	8,490	26.0	98.84
November	336.9	34.8	266.2	8,874	27.3	102.50
December	341.8	35.5	278.9	8,998	29.0	104.13
<b>2012</b>						
Jan.-Dec.	3,848.2	397.5	3,094.2	8,454	313.0	101.16
January	344.8	36.1	270.7	8,733	28.1	103.81
February	283.7	30.0	225.7	7,783	23.4	103.63
March	332.1	36.5	270.9	8,738	29.2	107.95
April	325.4	36.5	270.0	9,000	29.7	109.94
May	331.3	36.3	272.3	8,784	29.4	107.91
June	331.8	33.6	263.4	8,781	26.4	100.13
July	337.2	32.2	275.1	8,875	25.8	93.83
August	341.0	33.4	273.9	8,835	25.8	94.36
September	307.9	31.6	246.7	8,222	24.4	98.88
October	323.0	33.2	259.7	8,376	25.9	99.75
November	306.1	30.6	243.0	8,100	23.7	97.45
December	284.0	27.6	222.8	7,189	21.2	95.16

**Source:** U.S. Department of Commerce, U.S. Census Bureau, Report FT900, *U.S. International Trade in Goods and Services*, Table 17, February 8, 2013.

- 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.

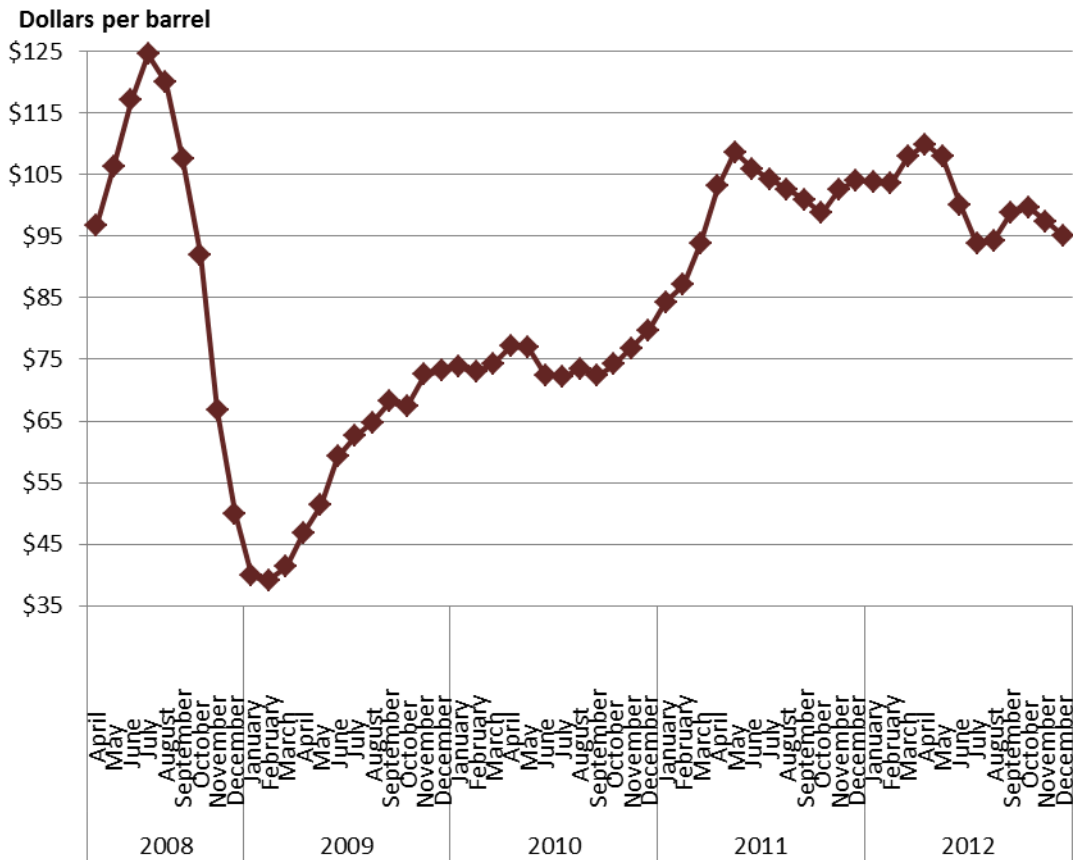
Crude oil comprises the largest share of energy-related petroleum products imports. According to Census Bureau data,<sup>5</sup> imports of crude oil fell from an average of 9.8 million barrels of crude oil imports per day in 2008 to an average of 9.1 million barrels per day in 2009, or a decrease of 7%.

<sup>5</sup> Report FT900, *U.S. International Transactions in Goods and Services*, Table 17, February 8, 2013.



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 \$103 per barrel in January to \$109.9 per barrel in May 2012, before falling to an average of \$93.8 per barrel in July 2012. By October 2012, crude oil prices had risen to nearly \$100 per barrel, before falling to \$95 per barrel in December 2012. As a result of the changes in crude oil prices, the total value of imported crude oil reached \$29.7 billion in April 2012, before falling to \$21.2 billion in December 2012.

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



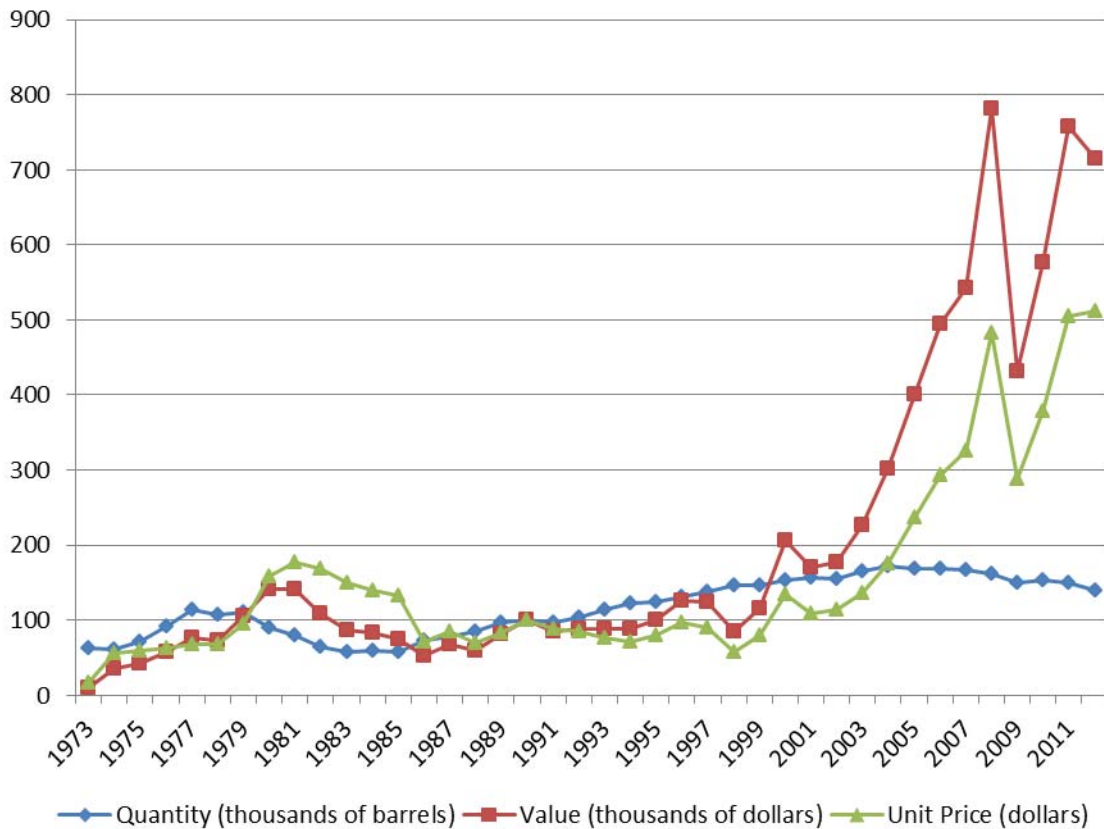
Source: U.S. Department of Commerce.

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 1973-2011, 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 40% between 1990 and 2012 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 512% between 1990 and 2012 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 700% between 1990 and 2012 on an index number basis.

**Figure 4. Quantity, Value, and Price of Imported Crude Oil by the United States, 1973-2011**

(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 2011, at an average price of imported energy

of about \$100 per barrel, the total cost of energy imports rose to \$421 billion, or about \$100 billion more than the cost of energy imports in 2010. Based on year end data, the value of energy-related imports in 2012 was \$397 billion, 5% below that recorded in 2011, thereby reducing slightly the contribution of energy-related products to the overall U.S. trade deficit.

## **Issues for Congress**

The rise in the prices of energy imports experienced from early 2012 through May 2012 likely will have a negative impact on the annual U.S. trade deficit in 2012, especially if those price run higher towards the end of the year. 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 the political turmoil in the Middle East and the rate of economic growth in Asia and other developing economies, combined in 2011 to push up the cost of energy imports. The pace of economic growth, however, stalled in the second quarter of 2012, which could have an important effect on both the levels of oil imports and on the price of such imports if economic growth remains listless. Typically, energy import prices have followed a cyclical pattern as energy prices rise in the summer 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, in 2012, the drought in the mid-Western United States reduced the production of corn and, therefore, the availability of ethanol, which put 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 oil prices. As was the case in 2008, high and sustained oil prices have a detrimental effect on the pace of economic growth in many parts of the world. It is possible for the economy to adjust over the long term to the higher prices of energy imports by improving its energy efficiency, finding alternative sources of energy, or searching out additional supplies of energy. Higher oil prices may well cause consumers to increase pressure on Congress to assist in this process. For Congress, the increase in 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 stall. 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. A sharp rise 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.

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