



An Exploration of Oil Shocks and Gasoline Prices in the US, Wisconsin, and the Eau Claire Metropolitan Statistical Area

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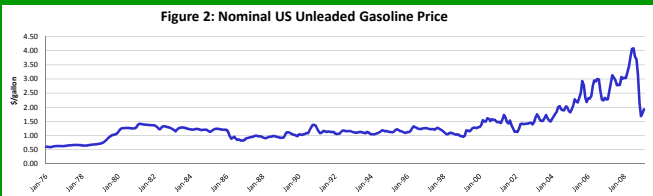
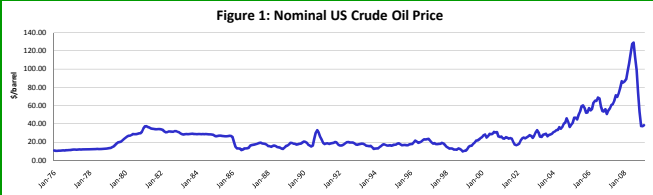
Description

In 2008 US prices for oil soared to nearly \$130 a barrel and gas prices also rose to over \$4.00 per gallon. Shortly after this dramatic event both oil and gas prices fell sharply to just under \$40 a barrel and \$2.00 per gallon respectively. Because Americans have become very dependent on both oil and gas to power their lives this major swing in prices over a relatively short time span attracted a lot of attention.

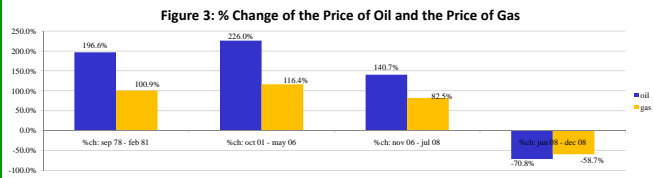
Our research poster tracks the historical prices for both oil and gas at the national level. In particular, we explore the most recent trends described above to other oil shock periods in history. We also examine the relationship between the price of oil and the price of gasoline over time. Lastly, we compare recent trends in gas prices across the US, WI and the Eau Claire Metropolitan Statistical Area (EC).

Oil and Gasoline Prices Over Time

Figures 1 and 2 present a time series look at the nominal prices for a barrel of oil and a gallon of regular unleaded gasoline from January 1976 through February 2009. The first thing to notice is that both prices move in tandem rising and falling together over the entire period. In fact, they move so closely together that the correlation coefficient between the two price series is 0.96.



Of particular interest are the periods of increasing prices during the oil shock of the late 1970s as well as the consistently rising prices of the early 2000s culminating with the most recent price spike in the summer of 2008. Certainly, we can see these price rises in Figures 1 and 2; however, Figure 3 provides a condensed look at the change occurring over the specific periods mentioned above.

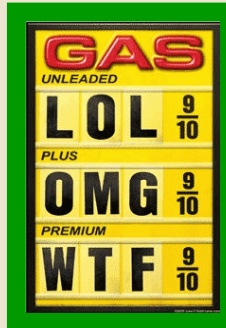


During the oil shock of the late 1970s, the price of oil jumped nearly 200% (tripled), while the price of gasoline doubled over this 2-and-a-half year period. After this shock, Figures 1 and 2 show that oil and gas prices remained relatively constant through the 1980s and 1990s, eventually entering a longer period of sustained price increases between 2001-06. Prices continued to rise to a peak in the summer of 2008 at over \$125 per barrel of oil and \$4 per gallon of gasoline.

It is interesting to note the consistent relationship between the prices of oil and gasoline during these periods of price increase. In particular, changes in the price of gasoline are typically only half as large as oil price changes in percentage terms.

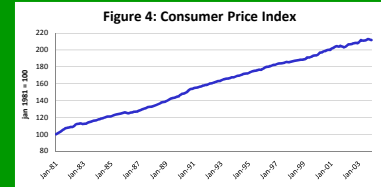
Turning our attention away from price increases, Figure 2 shows a dramatic decline in gas prices after the peak in the summer of 2008 falling more than 50% to below \$2 per gallon. Similarly, oil prices declined an even larger percentage (70.8%) to just under \$40 per barrel over the same period.

After the sustained period of rising oil and gas prices for the majority of the decade, these dramatic declines seemed unimaginable in such a short period of time. Given the importance of fossil fuels in powering our society, all eyes are on what will happen next for oil and gas prices.

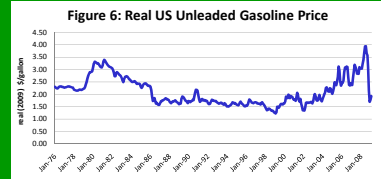
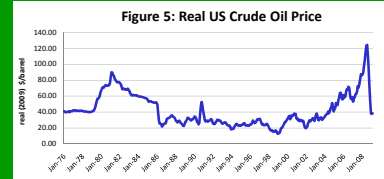


Real Prices Versus Nominal Prices

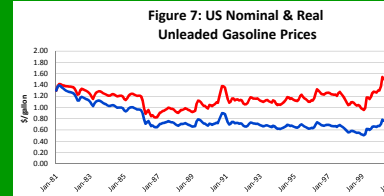
The prior analysis reported nominal prices which do not account for the increase in the overall price level for goods and services (inflation). Figure 4 shows the consumer price index, or general level of prices with January 1981 as the base. From this diagram we see that the overall price level for goods and services was continually rising through this entire period.



Figures 5 and 6 plot the real prices of oil and gasoline in 2009 dollars rather than the nominal dollar prices shown in Figures 1 and 2. It is worth noting that the relationship described earlier between nominal oil and gas prices holds when looking at real prices because each series has just been adjusted for inflation by the same factor.



As mentioned previously, nominal oil and gas prices remained relatively constant throughout the 1980s and 1990s. When the prices are adjusted for inflation, though, we see that the real price of gasoline actually fell over this 20 year period. Economists often point to this story as a perfect lesson in economic behavior. In the late 1970s and early 1980s when the real price of gas was high we saw the introduction of smaller and more fuel efficient vehicles. Despite many people talking about somewhat high gas prices in nominal terms during the later 1980s and 1990s, we actually saw people behave like gas was cheap as they moved toward larger pickup trucks and SUVs. This is largely because gas was historically cheap in real terms compared to other goods and services.



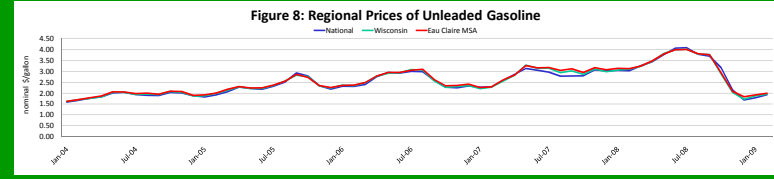
This fact can be seen in Figure 6 by the substantial decline from the peak of real gas prices in early 1981 through the 1980s and more gradually through the 1990s. Figure 7 best demonstrates the difference between nominal and real gas prices beginning in 1981. The nominal price, represented by the red line, almost never rises from 1981 almost to the turn of the century. As a result, the real price, represented by the blue line, generally fell over this period. This makes sense: if the nominal price of gasoline remains constant while the prices of all other goods and services rise, then the real price of gasoline must fall.

Comparing Regional Gasoline Prices

We now turn our attention to examining whether or not gasoline prices differ across regions in the US. People often talk in EC about how gas prices are higher here than other places in WI, and also that WI gas prices are higher than other states, in particular MN. We do not have the exact data that would allow us to address these questions because EC city gas prices are not readily available and we have not been collecting historical prices for MN.

We do however have data on monthly gasoline prices for the US, WI, and EC (the EC metro area includes Eau Claire and Chippewa Counties) from January 2004 – February 2009 allowing a comparison across these three areas.

In this case, the average price of a gallon of regular unleaded gasoline follows a strikingly similar trend in all three areas with a correlation coefficient of no less than 0.99 (between any two series). Figure 8 illustrates this point with the exception of a small period of time in mid-to-late 2007 where both EC and WI gas prices were higher than the US. This price differential reached a maximum in September 2007 with a \$0.23 gap between WI and the US, while EC was even higher with a gap of \$0.33. Shortly after this short period, gas prices in all three areas returned to being approximately equal and following the same trends.



All data was collected from the following Sources:
AAA Fuel Gauge report
US Bureau of Labor Statistics
Energy Information Administration