

## Gasoline, Productivity And Inflation

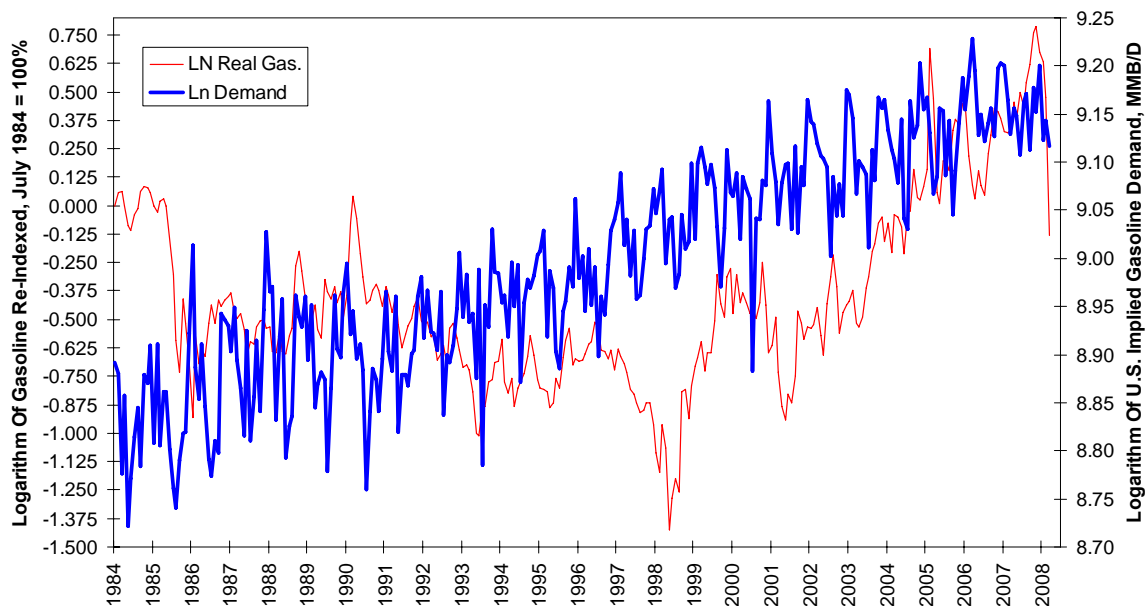
One of the things we learned, or re-learned as the case may be, during the spectacular August 2007 – July 2008 rally in petroleum is the public asked the wrong questions about how high the price could go. The question was framed in technical analysis terms, even though any and all technical resistance had been destroyed, or in fundamental analysis terms as if those had ever served anyone well in three decades of energy trading.

The answer, both here and in other cases of commodity usage, can be placed into a very simple framework: Can a buyer of gasoline add more economic value to that gasoline than its purchase cost? If the answer is yes, demand will remain stable. Moreover, if overall wealth levels continue to rise globally, global demand will continue to rise and overwhelm whatever braking effects may have existed from rising prices. In economic terms, the income elasticity of demand can exceed the price elasticity of demand.

The opposite can hold true as well, as the economic downturn in the fall of 2008 demonstrated. A weakening economy lowers demand for all fuels, regardless of any drop in price.

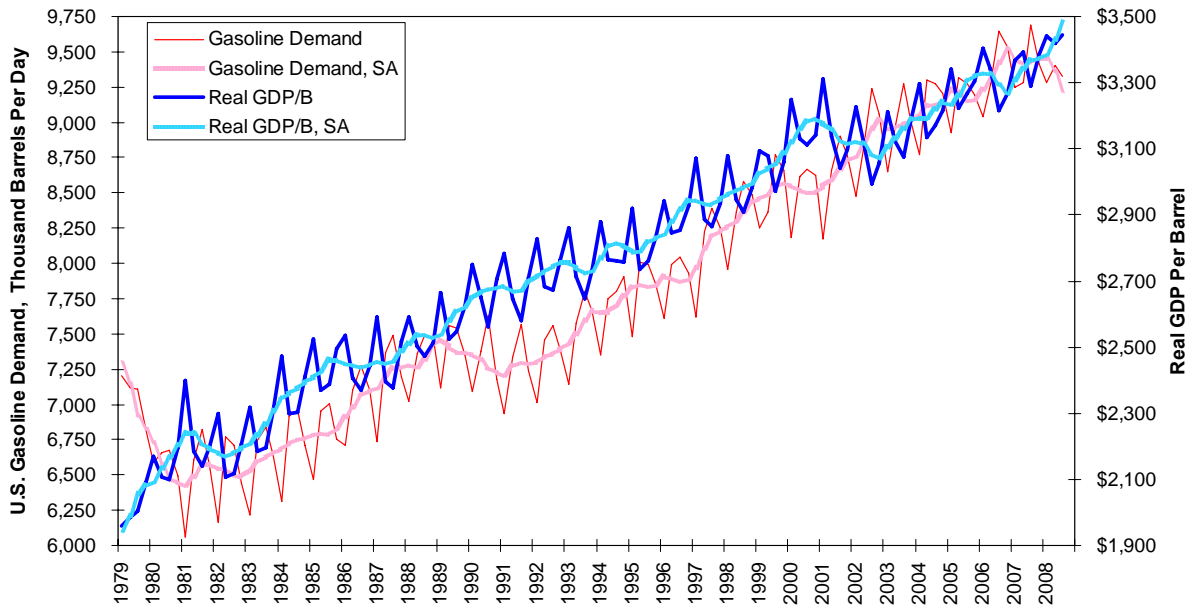
If we index constant-dollar gasoline prices to July 1984 levels and map it against total gasoline demand on a logarithmic basis to reflect growth rates, we see total gasoline demand has risen higher in an erratic fashion for almost a quarter-century independent of price. Total demand is used because this is how we are billed on a national income accounting basis and this is what affects the global price; we can play with per-capita and per-vehicle statistics until we get the answer we want, but that best is left to the masters of self-delusion at the Bureau of Labor Statistics. Quite simply, if the expected negative price elasticity of demand were operating at any lag of your choosing, we would see these lines moving in opposite directions. They have not over the past quarter-century.

### Where Is The Lead/Lag Relationship?



The reason, as alluded to above, is the American gasoline buyer keeps adding economic value to purchased fuel. If we map constant-dollar GDP per barrel of gasoline consumed against total U.S. gasoline demand, we see two lines moving together in an irregular sawtooth pattern. That pattern reflects seasonality, of course, so we can adjust the two data streams and plot their trend values. Incredible as it may seem to anyone stuck in a traffic jam, the constant-dollar productivity of gasoline consumed has increased steadily for three decades.

### Rising Productivity of U.S. Gasoline Consumption

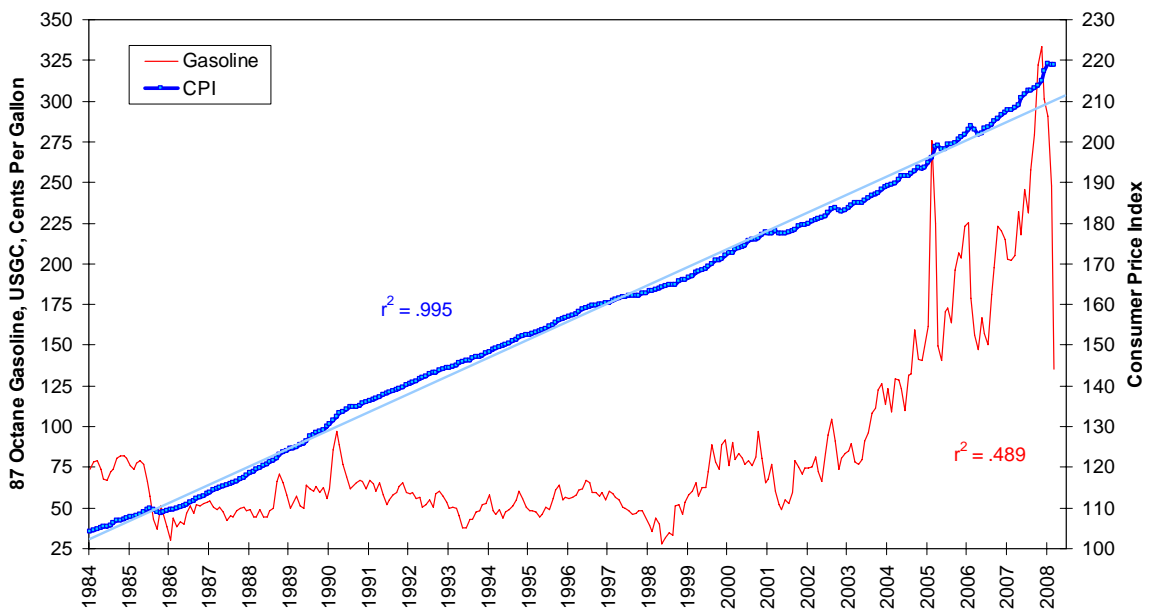


### The Inflation Non-Connection

A common instinct is to dismiss the use of inflation adjustments when speaking of anything related to gasoline on the grounds gasoline is the cause of inflation. We sniff, and this is irrespective of the whole nonsensical debate on whether food and energy costs should be stripped out of the Consumer Price index to form the “core” measure (Our answer: No).

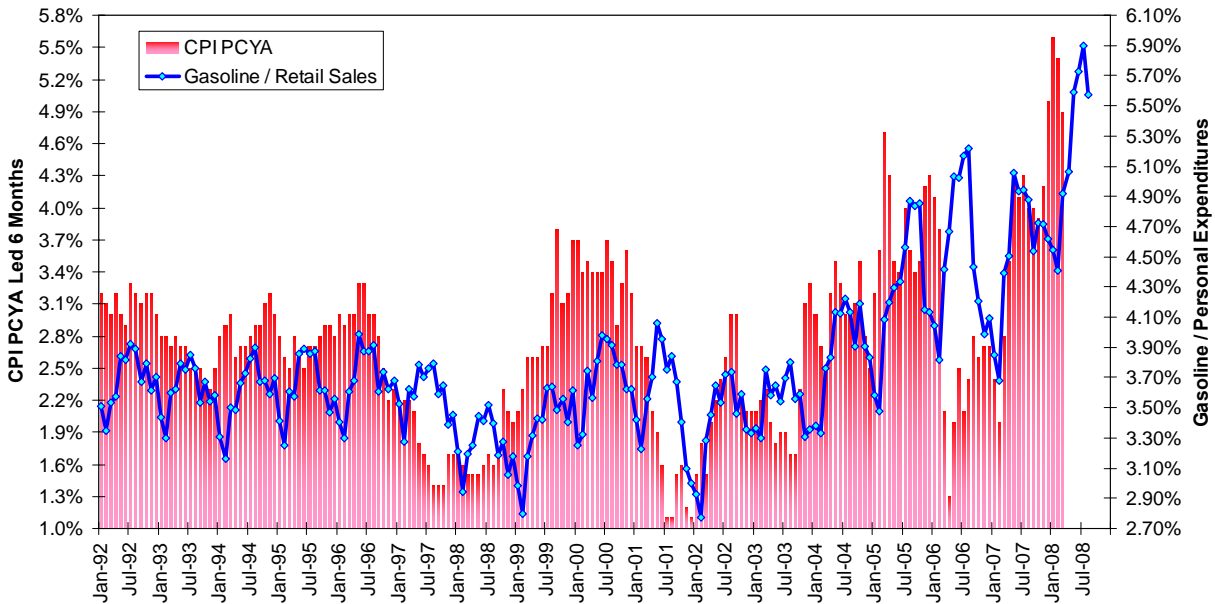
The simple fact of the matter is the CPI has risen far more as a simple function of time than of any function of gasoline prices. If we regress the CPI against time, we get an r-squared or percentage of variance explained, of .995. If we regress it against gasoline, we get an r-squared of .489. Restated, we can explain movement in the CPI more than twice as well by simply using a ruler on a chart than by using gasoline prices. Once again, we find ourselves in the position of saying, “It may be true, but we know nobody believes it.”

### Gasoline Does Not Drive Inflation



Rising gasoline prices affect other consumer prices, but not via the mechanism expected by many. They claim an ever-greater share of consumer purchases, and this share tends to be offset by an official policy of lower interest rates. If we map the share of retail sales made at gasoline service stations to all retail sales against changes in the CPI led six months, we see a definite relationship.

**Gasoline Expenditures And Consumer Inflation**



**The Global Connection**

The focus above has been on the U.S. market, which used to be sufficient. However, we need to step away from this one-market focus and look at the real issue propelling rising petroleum and gasoline consumption and prices, and that is worldwide demand. It may be a cliché you are tired of hearing, but rising income levels in China, India and in the oil-exporting regions of the Middle East have overwhelmed rising prices. Restated, someone in China who has waited all their life to get a car is going to get that car and drive it at almost any price of gasoline.

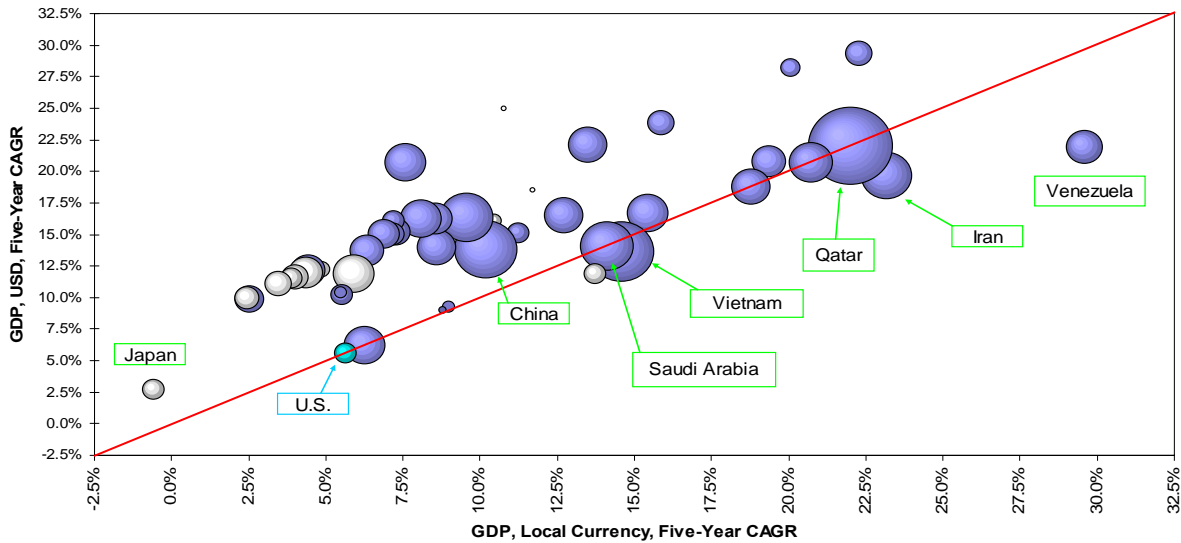
As noted above, we have two principal elasticities of demand, price and income, and these numbers vary across time. The experience of the oil shocks of the 1970s and early 1980s was short-term price inelasticity of demand, or rate of change in demand relative to the rate of change in price, was relatively minor, but it became quite significant over time.

We tend to focus on price elasticity. Income elasticity of demand, the rate of change in demand relative to the rate of change in income, was observed during the Asian crisis of 1997-1998. It produced a sharp, income-related downturn in energy consumption in that previously rapidly growing region. Income elasticities, just like price elasticities, tend to increase with the length of the response period.

If we look at a set of countries, we can see income effects after the data are rearranged from the USD price of gasoline to the local currency price of gasoline. The bubbles, several of which are labeled, depict the five-year change in gasoline consumption as a function of compound average annual nominal GDP growth rates in local currency and USD terms. The size of the bubble represents the growth rate, with white bubbles denoting negative growth rates. Values to the northwest of the red line represent countries whose currencies appreciated relative to the USD over the past five years.

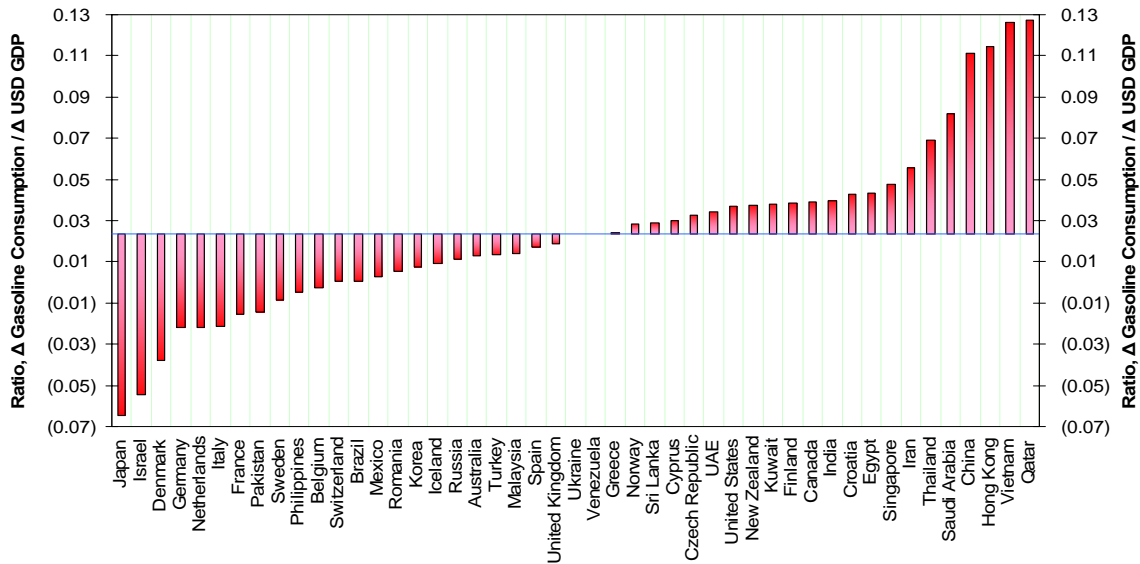
The results below are as we expect: The further northeast we move, the larger the blue bubbles. This is income elasticity of demand in operation.

**Five-Year Change In Gasoline Consumption As A Function Of GDP And Currency Change**



We can rearrange the data in the chart above to rank countries on the basis of five-year changes in gasoline consumption relative to five-year changes in their GDP expressed in dollars. We see how many of the oil exporters, particularly those who subsidize the retail price of gasoline for their citizens, have the highest rates of change. If you were a leader of an oil-exporter, what would you do in this situation? Make your own citizens pay more and subsidize consuming countries? Hardly.

**Whose GDP Growth Was Most Gasoline-Dependent?**



**The Market Worked**

Veteran market observers know there is no such thing as a one-way forecast. Higher prices can do two things, change demand behavior and induce new supply. Both of these occurred after mid-2008; until they did, the price of petroleum kept rising. That is the role of a market, as unpleasant as it may seem: Find the price that changes behavior. The answer in the case of petroleum was higher prices could be absorbed so long as economies continued growing. When that changed, income elasticity overwhelmed price elasticity; we should assume the long-term bull market in all energy commodities will resume once the global recession ends.