



Higher Gasoline Prices: Temporary or Time to Buy a Hybrid?

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“The days of persistently cheap oil are over. The good news is that, in the longer run, we have options.”

—Ben S. Bernanke, then-Governor of the Federal Reserve Board, October 21, 2004

Consumers may not remember the prices of many of the goods and services they buy, but few forget what they pay for gasoline. This spring, U.S. consumers first celebrated the continual decline in gasoline prices in May and June but bemoaned another surge in prices in July. Why do gasoline prices grab so much attention? The answer is simple: Gasoline is purchased on a regular basis and its consumption accounts for a significant part of U.S. daily spending. Between 2002 and 2011, U.S. consumers spent an average of \$972 per capita per year, or \$19 per week, on fuel energy consumption—mostly gasoline—which accounts for 3.3 percent of total personal consumption expenditures.¹

As they budget for expenses, individual drivers may begin to wonder if the most recent spike in gasoline prices is temporary or whether it will be longer lasting. Are prices expected to eventually decline, perhaps to the days when gasoline prices were still below \$3 per gallon? Or is it time for drivers to alter their behavior, say by buying a hybrid car?

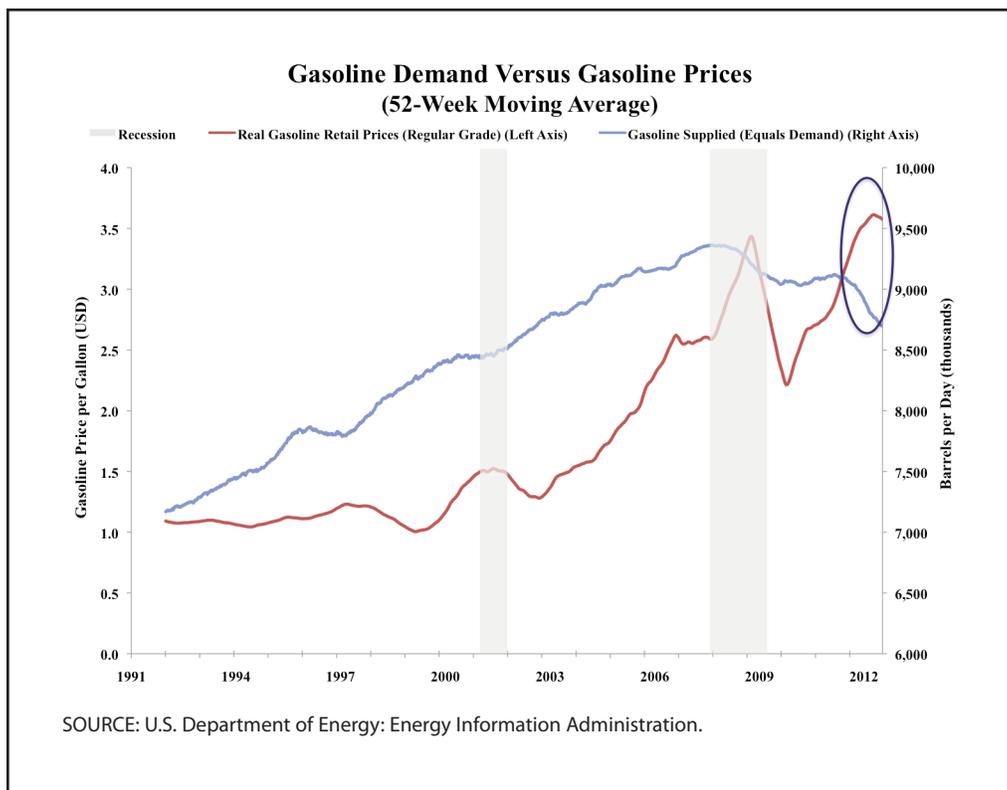
Typically, consumers buy less of a good when the price increases. In economics, this is referred to as the **law of demand**. However, the magnitude of the change is not necessarily the same for all goods. **Elasticity of demand** is a measure of how responsive consumers are to a change in the price of a good or service (see the glossary for more details). For example, it is not always easy for consumers to adjust gasoline consumption when the price of gasoline jumps unexpectedly. As a result, they continue to purchase almost the same amount of gasoline as before the price jump; this is referred to as **inelastic demand**. In contrast, it is easier for consumers to adjust the quantity of other goods consumed in the short run, such as hot dogs, when the prices of such goods increase because there are close **substitutes** for goods like hot dogs available, say cheeseburgers; this is referred to as **elastic demand**. In short, when the demand for a good or service is elastic (inelastic), a change in its price results in a proportionately larger (smaller) change in its quantity demanded.

Historically, the demand for gasoline has been relatively inelastic in the short run. For instance, as gasoline prices doubled from 2002 to 2011, the expenditures per capita on gasoline also increased by 91 percent.² The fact that people still need to commute to work or travel to other places and that there is no readily available alternative energy source for gasoline makes it difficult to reduce the quantity demanded of gasoline in the short run, even when gas prices are high. Given that consumers' budgets stay the same, this means consumers will have less to

spend on other goods. Fuel-consuming businesses (e.g., manufacturers and service delivery companies) will also find it is more costly to operate. When costs increase by a certain margin, firms tend to increase their prices or reduce production. Then, the contraction in consumer spending and production both directly and indirectly endangers the growth of the broader economy as measured by gross domestic product. As the chart shows, spikes in gasoline prices are often followed by a recession.³ Moreover, if consumers or firms expect the increases to be temporary, they may not have any incentive to change their investment decisions (e.g., buying a more fuel-efficient car) or lifestyle choices (e.g., driving less).

However, once consumers and firms realize that higher gasoline prices may not decline and are likely to continue to increase, they begin to make those changes. The chart shows that since 2008, total gasoline consumption has fallen. Most notably, gasoline consumption moved downward during the latest spike in gasoline prices (circled on the graph). This evidence suggests that consumers are finding it easier to vary their gasoline consumption when prices change.

Two possible reasons may explain the decline in gasoline consumption. First, consumers are able to adjust their gasoline consumption habits over time in response to continually rising gasoline prices. For example, instead of driving alone, more people may share rides or use public transportation. Some people may consider commuting costs when they choose where to live and thus move closer to work.⁴ In addition, household preferences have gradually shifted toward more fuel-efficient cars. A study from the University of Michigan finds that gasoline engines gained an average of 2.3 mpg in fuel economy from 2008 to 2012.⁵ Large companies and government agencies are also seeking ways to cut transportation fuel use. For instance,



FedEx plans to cut its fuel consumption by 20 percent by 2020 by adding more hybrid vehicles to its fleet.⁶

Second, the expectation of higher gasoline prices spurs incentives to develop alternative energy sources. One example is the boom in natural gas production: From 1990 to 2011, the demand for natural gas increased by about 33 percent. More school buses, trash trucks, tractor-trailers, and public transit buses are making the transition to natural gas engines.⁷ Moreover, automakers are actively designing and improving hybrid vehicles that run on both electricity and gasoline. Over the longer term, the greater the availability of substitutes in the market, the more elastic the demand for gasoline will become.

Gasoline is vital to the U.S. economy because of its widespread use by individuals and industries—it helps keep our economy moving. In turn, this strong dependence on gasoline can have a negative impact on consumers' daily lives and the economy when gasoline prices continually rise over time. Although a deep recession and a weak economic recovery have played a part, energy conservation and new technologies that have increased energy efficiency and spurred the development of new energy sources seem to be the primary reasons that consumers and businesses have changed their demand for gasoline in recent years. How consumers and businesses will continue to modify their gasoline consumption largely depends on what they expect gasoline prices to do. It is also a factor to consider when thinking about buying a hybrid. So, is it time for a hybrid? ■

NOTES

¹ Figures are adjusted for inflation.

² Figures are adjusted for inflation.

³ This does not necessarily imply that gasoline prices have caused the recessions but they may have been a contributing factor. See Hamilton (1985).

⁴ See Molloy and Shan (2010).

⁵ See Schoettle and Sivak (2012).

⁶ See Mufson (2012).

⁷ See Krauss and Lipton (2012).

REFERENCES

Hamilton, James D. "Historical Causes of Postwar Oil Shocks and Recessions." *Energy Journal*, January 1985, 6(1), pp. 97-116.

Krauss, Clifford and Lipton, Eric. "[U.S. Inches Toward Goal of Energy Independence.](#)" *New York Times*, March 23, 2012.

Molloy, Raven and Shan, Hui. "[The Effect of Gasoline Prices on Household Locations.](#)" Working Paper No. 2010-36, Federal Reserve Board Finance and Economics Discussion Series, June 2010.

Mufson, Steven. "[\\$4 Gas Reinforces Trend Toward Lower U.S. Fuel Consumption.](#)" *Washington Post*, April 17, 2012.

Schoettle, Brandon and Sivak, Michael. "[Recent Fuel Economy Trends for New Vehicles in the U.S.](#)" University of Michigan Transportation Research Institute, Report No. UMTRI-2012-2, January 2012.

GLOSSARY

Elasticity of demand: The ratio of the percentage change in quantity demanded of a good or service to the percentage change in its price; a measure of the responsiveness of buyers to a change in the price of a good or service. Many factors influence demand elasticity. The typical ones are the availability of close substitutes, whether the good is a necessity or a luxury, the definition of a market, the relative purchase size, and the time horizon.

Elastic demand: The type of demand that exists when the percentage change in quantity demanded is greater than the percentage change in price.

Inelastic demand: The type of demand that exists when the percentage change in quantity demanded is less than the percentage change in price.

Law of demand: As the price of a good or service rises, the quantity demanded of that good or service falls. Likewise, as the price of a good or service falls, the quantity demanded of that good or service rises.

Substitute: A similar good. With substitutes, the price of one and the demand for the other tend to move in the same direction.

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