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The Basic Economics of a Disaster

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The Basic Economics of a Disaster

Abstract

This short paper addresses the market forces in the retail gasoline markets in the United States in the aftermath of hurricane Katrina. Although the price increases were substantial, it is argued that the markets essentially acted as a rationing agent during a time of 10% reduction in refining capacity and major national turmoil.

The Basic Economics of a Disaster

The tragic results of Hurricane Katrina have affected every American's life emotionally, spiritually and personally. Each citizen and resident of the United States has had to realize the impact of such events in our lives. As with all such events, some people have experienced the hurricane with far more consequences than others. The residents of the Gulf Coast have of course suffered the most. For them, the rest of America is deeply saddened and concerned about the future. The vast amount of private outpouring of donations and volunteering that has occurred shows this concern.

For many of the rest of America the most obvious result of the hurricane has been the impact on energy markets. Leading up to the direct impact of Katrina, gasoline prices in particular were rising. Following the impact of the she-monster from the Gulf, gasoline prices have risen drastically. As such, many representatives of elected bodies at the state, local and federal levels have pointed fingers at a whole variety of protagonists. Members of the press have hunted down scapegoats for this "debacle." Citizens have become reasonably outraged at paying \$50-60 for a tank full of gasoline.

But these prices are exactly what society needs at present. A catastrophic disruption has occurred to the gasoline market of the United States. Estimates indicate that roughly 10% of the domestic refining capacity has been at least temporarily removed from production. Some other industries, such as shrimp fishing and processing, may have received more yet undetected, damage. But everyone is aware of gasoline prices.

The Precursors to Katrina

In the year preceding Katrina, retail gasoline prices were almost continuously rising. Due to a whole variety of national and international events the basic price of crude oil has reached unprecedented levels. Refining capacity in the United States has been overwhelmed for several years due to the lack of new refining plants coming online. Globally, refining capacity is also pushed to the limit.

Although crude oil is a rather sedentary product in deep wells; gasoline is a rather volatile concoction that does not have a long shelf life. Particularly in the United States, some environmentally mandated blends have particularly short shelf lives. Thus, as refineries are working at full capacity for current consumption, stock piles of gasoline are not realistic.

As oil and gasoline prices have continuously risen in the last year, the story line has been the same: demand is rising. Domestically and globally, the demand for oil based energy sources has been increasing as America has adopted the philosophy of driving fuel inefficient vehicles and the Pacific Rim has grown in population and per capita consumption. Energy consumption is no longer guided by the American economy. Energy production is nowhere near guided by the United States. The market is global and will become increasingly more so.

These precursors to Katrina were already having a major influence on American gasoline prices in the weeks and months preceding the disaster.

The Supposed Purpose of FEMA

Following Katrina's predecessors, Hugo and Andrew, the American society realized that market economics were unable to respond to disasters of such magnitude. As the population increased in hurricane prone areas, the horrific results of major hurricanes made the American public aware that catastrophic storms were a reality. The question has become one of where will the next one hit?

Hurricanes, tornados, earthquakes and forest fires are the worst imagined events. As a society an “insurance” program was developed called FEMA. In the event of these calamities, markets are unable to satisfy the true human need of desperation and grief. FEMA was designed to fill the gap when markets fail.

Cots, medicine, food, tents, water, clothes and the like (but rarely toys) are moved into disaster areas when a catastrophic event occurs. This is the social contract Americans have. However, FEMA seems to have forgotten the energy needs. It is true, that in the immediate days and weeks following Katrina gasoline is a rather meaningless commodity since most cars are useless by being damaged and the roads are impassable. Given the volatile nature of refined gasoline, long term storage is difficult, but seasonal storage is possible without seriously disrupting markets if nothing happens.

The supposed purpose of FEMA is to alleviate the market disruptions when a catastrophic event occurs. Due to exceptional price spikes for various goods following hurricanes Hugo and Andrew, one of FEMA’s purposes is to alleviate human suffering by providing basic supplies without regard to market economics. But when FEMA is unable to do so, then the only recourse is for markets to fill the gap. Those are the only two choices given the structure of the polity and economy in the United States.

The Role of Markets

Following the devastation of Katrina to the energy infrastructure of the United States, the markets are doing exactly what they should do. Prices are rising. The production of gasoline has been severely restricted and the hurricane has made the situation even more so. For cultural and sociological causes the demand for this product has been increasing. The basic economics for the last year or more has resulted in increasing prices.

And now this.

Energy economists have often giggled or chortled about how many people get blamed for increasing energy prices. That is not the case now. The gasoline station owners, the vast majority, are not taking pleasure in this situation. The refinery workers are working as hard as they can for as many hours as they can. The production workers at the oil wells are under such pressure to get the product out of the ground. This is a moment in time of human suffering and pain. Domestically and globally, the energy industry has never worked so hard.

Adam Smith said it wasn’t for the benevolence that the candlestick maker worked, but he also didn’t argue that the young apprentice didn’t have a soul. Smith also argued that prices said those candlesticks end up where they most useful. Such is the case with gasoline, and other energy sources.

The Basics of Pricing

The amount of available gasoline, or any other product, in Anytown USA is X. Based on the demand for the product the price will be Y. If the price in Sometown USA is less than Y, then product will flow to Anytown. This lowers the price in one place and raises it in the other. The fundamental governing variable is how many people driving SUVs will pay the higher price in which town. If it is Philomath Oregon, then the product will flow there and away from Walla Walla Washington. The important question is: what is the demand? It does not matter: what is the fixed supply?

The American gasoline supply is severely restricted. It flows to where prices are highest and demand is greatest.

Price Controls?

Some states have responded to Katrina by proposing price controls on the refineries. Obviously, when prices in Newark are \$3.50 per gallon something is wrong. Only X amount of gas is available from the New England market. Given the demand for gas in Newark, the price is \$3.50. At this price, the wholesale price to the gas station owner is, say, \$3.25. The station owner sells 20,000 gallons a day. The wholesaler and the station owner have a working market relationship.

New Jersey passes an emergency law limiting the wholesale price to \$2.75. What does the wholesaler do? New York has no such law. So the refinery shifts sales to New York. The amount of gas arriving in Newark will be sharply decreased, so the prices will rise at the retail outlets. How long are those lines for \$7.00 gas? What happens to the price in NY? Now New York is receiving more supply of finished product and the street price will drop. The end result of the emergency price control in New Jersey actually hurts New Jersey residents and helps New Yorkers.

Even worse results are likely if the price cap is placed on the retail price. If the price differential between New Jersey and New York becomes too much, then absolutely no gasoline will be sold in New Jersey.

Price Spikes

The current price spike due to Katrina is not the first, nor will it be the last. The sheer magnitude of Katrina, geographically and production-wise, has made the spike substantial in size and national in scope. The gasoline refinery industry is clustered in several geographic locations, all of which are potential sites of catastrophic scenarios: earthquakes in San Francisco or Los Angeles, another hurricane on the Gulf Coast or even major winter storms on the east coast can delay delivery by supertankers such as in 1999. The pipeline distribution is also vulnerable to a variety of scenarios including terrorism.

When supply disruptions do occur the markets adjust accordingly. Of course this results in price spikes, some of which may seem backwards, but are easily explained. For example Arizona's Attorney General Goddard seemed puzzled when prices in Arizona increased to above those of California. Since Arizona's supply comes from both California and Texas, the need to hold some gas back from Texas in the aftermath of Katrina explains a more severe cutback in Arizona. (And essentially none in California.)

Investment and Profits

The billions of dollars invested in the gasoline industry are a vital part of the national infrastructure made primarily by publicly traded businesses with the aim of creating wealth for their stockholders. There is no doubt that many of these businesses will reap substantial profits during this current price hike. However, a substantial portion of this infrastructure has been damaged by the storm. Additionally, substantial damage was done to the oil drilling infrastructure – much of which is owned by the same companies. As such, the current increase in profits will be offset by the increased amount of investment to repair the infrastructure.

The added profits will also increase the wealth of the stockholders of these companies. These stockholders include many of the people who have been harmed by the events. Numerous firms have made substantial contributions to various funds aiming at relief. Additionally, the increase in profits will result in increased taxes being paid by these corporations.

The Markets are Working

The rapid increase in retail gasoline prices is a signal that the markets are working toward the equilibrium solution in the aftermath of the Nation's most horrific natural disaster. The 10% decrease in production capacity and the increasing demand for gasoline both point toward substantial price increases.

If the nation hopes to limit the effects of increasing gasoline prices in the future several steps are available. Instead of driving SUVs and other gasoline intensive vehicles, more fuel efficient ones are available. This change is likely to occur anyway, and the CAFE standards could be increased. Electric cars powered by electricity produced using wind or solar energy are a reasonable substitute. And of course public transportation is an alternative mode of useful transportation. In the meantime, the gasoline markets are properly allocating and delivering the available product to where the demand is the greatest. Even now after two weeks, with the demand-side panic diminishing and some repair of the infrastructure, prices have started to dip.