

Prepared Testimony of
W. David Montgomery, Vice President
CRA International

Gasoline Prices, Oil Company Profits, and the American Consumer

Subcommittee on Oversight and Investigations
Committee on Energy and Commerce
U. S. House of Representatives

May 22, 2007

Mr. Chairman and Members of the Committee

I am honored by your invitation to appear today, as the Committee addresses questions about gasoline prices and the American consumer. I am Vice President of CRA International, co-head of CRA's global energy and environment practice, and an economist by profession and training. I have conducted research, published books and papers, and testified on oil markets, gasoline price controls and related subjects for the past 30 years. This testimony is based on a recent study that I conducted at the request of the American Council for Capital Formation. It is available for download at http://www.crai.com/pubs/pub_7024.pdf and has been accepted for publication in the *Journal of Competition Law and Economics*. My statements today are my personal conclusions and opinions, and do not necessarily represent positions of CRA International or any of our clients.

I would like to make 4 points:

Prices set by a competitive market serve a useful purpose. They provide the incentives for new supplies to meet rising demand, and they allocate available supplies most efficiently among competing uses.

In all our experience with gasoline price increases, there has never been evidence that those increases were caused by anything but the normal operation of a competitive market.

Price increases are far from the worst thing that can happen to consumers when there is a shortage.

The refining industry has swung from glut to shortage to glut, and overall has been losing money for decades, and in a volatile market like gasoline it is only during the peaks that returns adequate to motivate investment are earned.

The Function of Rising Prices

When demand exceeds available supply, rising prices serve to allocate limited supplies to their most highly valued uses. In an open competitive market, users for whom the scarce supply has the highest value are willing to pay the most. The market price is bid up until

consumers who place a lower value on using gasoline than the market price drop out, and prices rise until demand is driven down to a level equal to available supply.

At the same time that rising prices motivate consumers to conserve and forego uses of gasoline for which it is no longer worth paying the higher price, rising prices also motivate suppliers to take increasingly costly steps to increase supply.

We saw all these responses to higher prices in the aftermath of Hurricanes Rita and Katrina. Prices rose not only in the region where the hurricanes made landfall, but throughout the Eastern United States. These price increases caused drivers in areas not affected by the hurricanes to reduce their use of gasoline, and the fuel thus freed up flowed south to serve those in need. At the same time, suppliers drew down inventories and purchased more costly supplies from overseas markets to serve the need in the Gulf region. Finally, refiners rushed repairs on damaged facilities and increased utilization of operable refineries to extraordinarily high levels, in both cases incurring additional costs that were justified by the higher prices in the market.

The FTC's findings about the price increases after Rita and Katrina provide a good illustration of how higher prices work when there is a mismatch between supply and demand.

“Nationally, gasoline supply (including domestic refining production and imports) decreased by 3.9% for the four weeks ending September 30 relative to refinery production and imports for the four weeks ending August 26, 2005. Using well-established estimates of consumer sensitivity to price, staff calculated the likely price effect of such a reduction in supply. This analysis suggests that, in the short-run and assuming no anticompetitive behavior or price manipulation, prices would have risen on average by about 19.7% in September. The actual average price of a gallon of regular grade gasoline in the month of September 2005 was \$2.95, a 16.7% increase over the August average price. In the short-run, given the size of the supply disruption, prices should have risen on average more than they actually did. The likely reasons for the somewhat lower than expected price increase were increased imports, the seasonal decline in gasoline demand, and the drawing down of gasoline inventories.”¹

There is no need to take the FTC on faith. This is transparent economic analysis in which the facts and theory are clearly stated and abundantly support the conclusion.

The Record On Claims Of Price Manipulation

There have been numerous instances of regional price spikes in the past decade, all of which have been investigated extensively by the U.S. Department of Energy (DOE) and by the FTC. These studies include:

- An Analysis of Gasoline Markets Spring 1996, U.S. Department of Energy, June 1996

¹ Federal Trade Commission. (Spring 2006). Investigation of Gasoline Price Manipulation and Post-Katrina Gasoline Price Increases, p. 67. The 19.7% expected price increase is a function of a 3.9% reduction in gasoline output combined with a short-run price elasticity of gasoline of -0.2 (3.9% divided by -0.2). See Energy Info. Admin., U.S. Dep't of Energy, Petroleum Navigator: Weekly Retail Gasoline and Diesel Prices, at http://tonto.eia.doe.gov/dnav/pet/pet_pri_gnd_dcus_nus_w.htm (last modified May 1, 2006) (shows weekly retail prices of regular gasoline).

- EIA's Assessment of Summer 1997 Motor Gasoline Price Increase
- EIA's 2003 California Gasoline Price Study November 2003
- EIA's Inquiry into August 2003 Gasoline Price Spike
- The FTC's Midwest Gasoline Price Investigation
- The FTC's Study of Katrina and Rita Hurricanes

Their conclusions **in every case** have been that gasoline price increases were due to the operation of supply and demand in light of an interruption of supply, and that the magnitude of price increases was consistent with the magnitude of the loss in supply. There has never been a finding that gasoline price increases were caused by any manipulation of the markets.

There Are Worse Things Than Price Increases

Consumers don't win when prices are not allowed to rise. Shortages are made worse and those who need fuel most are least likely to get it. These points are made eloquently by one of the most distinguished practitioners in the field of law and economics, Judge Richard Posner. He recently wrote that:

In times of catastrophe, with consumers hurting, the spectacle of sellers benefiting from consumers' distress, while (it seems) deepening that distress by charging them high prices, is a source of profound resentment, and in a democratic society profound resentments trigger government intervention.

Such intervention is nevertheless a profound mistake, and not only from some narrow "economic" perspective that disregards human suffering and distributive justice. If "price gouging" laws or even merely public opinion deters refiners and dealers from charging the high prices necessary to equilibrate demand and (reduced) supply, there will be shortages. Consumers will still be paying a higher price than before the shortage, but they will be paying the higher "price" in the cost of time spent waiting on line at gasoline stations, or (if they drive less because of the shortage) in the form of restricted mobility. And those who need the gasoline the most, not being able to express their need by outbidding other consumers for the limited supply, will suffer the most from the shortages. The only beneficiaries will be people with low costs of time and non-urgent demand.²

Consumers Suffer More When Prices Do Not Increase

It seems paradoxical that consumers are not better off when prices are kept low by some form of government intervention. But when supplies are not available, something has to bring demand down to equal available supply. If its not prices, then it must be something else that raises the cost of obtaining a gallon of gasoline. In previous shortage situations in which price controls were imposed, waiting caused the higher cost. And we have had sufficient experience with price controls to conclude confidently that the lost value of time spent in line exceeds the out-of-pocket saving from lower prices.

² The Becker-Posner Blog, October 23, 2005 Should Price Gouging in the Aftermath of Catastrophes Be Punished?—Posner
<http://www.becker-posner-blog.com/>

For example, California created an experiment in what will happen when prices are kept artificially low. The State of California ordered Chevron to refund alleged overcharges by reducing the price it charged for gasoline at the pump. The result was a period of several months in which there were long lines at Chevron stations, and no lines at other stations that continued charging normal prices. This experience provided data for understanding how the decision of whether and how long to sit in line was made, and to quantify the cost of the time lost in waiting for gasoline and the amount of time cost that was required to ration available supply to meet demand. Two economists who studied this event³ found that the added costs associated with price controls were 116 percent of the monetary saving provided by price controls.

Thus, in the most simplified form, price controls convert the transfer of income between buyers and sellers that normally occurs when prices rise into a pure waste of time. The higher payments that would be received by sellers remain in the economy, and in turn flow into higher corporate tax payments, additional investment, and higher returns to shareholders. Thus payments by consumers flow back to households through higher returns on capital and lower taxes. Time wasted can never be recovered.

While the historical record suggests that U.S. gasoline markets respond efficiently to supply shortfalls, the same cannot be said of efforts to control prices and allocate supplies through rules set by governments. History teaches us that price controls on gasoline have had unintended and undesirable consequences, even when they were designed with care and included very specific rules defining legal prices and mechanisms to allocate shortages.

Shortages made are made worse by effects on both the demand and supply side.

On the demand side, price controls make shortages worse by the reaction of consumers to the discovery that they cannot count on gasoline being available when they pull up to a pump. Thus price controls induce behavior that makes lines longer. More frequent fill ups due to fear of running out put more people in line, thus lengthening queues. Pump capacity at each individual retail station becomes an issue with the higher volume of customers resulting from more frequent fill ups; more pump capacity is needed for the same amount of total sales, which further compounds the slowing rate at which tanks can be filled.

On the supply side, price controls dissipate the motivation for producers to incur additional cost to relieve a shortage. In the case of Rita and Katrina, lost supplies were replaced with higher priced imports and refiners made extraordinary efforts to increase output and repair damage. Significantly greater harm would have been done by the hurricanes without these responses.

Those Most In Need May Suffer Most If Prices Cant Rise

Waiting does not allocate gasoline to the customers who put the greatest value on gasoline, but to those that have the combined highest value and lowest cost of waiting. Oil shortages and subsequent pricing restrictions in the 1970s revealed that regulations

³ Robert T. Deacon and Jon Sonstelie. "Rationing by Waiting and the Value of Time: Results from a Natural Experiment." *Journal of Political Economy*. 93.4 (1985).

cause markets to malfunction and created allocative inefficiencies. Indeed, loss of consumer satisfaction, a higher level of inflation, and increased unemployment resulted from the conditions.⁴ Lower income families were disproportionately affected by these outcomes. While intuition tells us that lower prices might benefit lower income families, empirical evidence shows that choosing between a significantly cheaper gasoline station with wait time and a more expensive no-wait station is not highly sensitive to variations in income.⁵ Rather, price caps in effect give individuals with more resources at their disposal, i.e. higher income, the advantage of using their resources to obtain the scarce good. Those with high values of time have an incentive to hire other with lower values of time to wait in line on their behalf.

In the case of Katrina and Rita, those in the region hit by the hurricane would have been most severely hurt by price controls. Evacuees did not have time to sit in the lines that would have been caused by prices below market clearing levels, and the entire region would have been short even further because supplies would not have been diverted from the North. Paradoxically, it was consumers in the North who would have benefited if gasoline prices had not risen after Rita and Katrina, and they would have done so at the direct expense of those trying to escape the storms and rebuild their homes.

It also appears that price controls in the past have had their most grievous effects on rural area. A study of the U.S. gasoline crises of 1973-1974 and 1979 revealed that the allocation program reduced supply most drastically in rural markets—imposing costs 75% higher than in urban areas.⁶ Indeed, areas with extraordinarily low population densities are where gasoline is needed most since travel is necessary to obtain even the most basic of goods. Urban areas, on the other hand, provide easy substitutes to automobiles with well-developed public transportation systems and a higher density of commercial areas within walking distance. Price caps hurt rural areas even more by lowering incentives for petroleum distributors to incur additional costs needed to get gasoline to remote areas. Were markets able to determine the prices, rural areas would be willing to pay higher prices to induce distributors into driving the extra distance.

Who does get gasoline when prices do not rise? Those who don't have to get somewhere right away; who can send someone for them; who know something others do not.

Periods of Elevated Prices Provide The Only Incentive for Long Term Investment in Refining Capacity and Thereby Lead to Future Price Reductions

Capital intensive industries such as refining commonly experience fluctuations in supply, demand and prices, and are only able to recover their long term capital investment because of profits earned during periods of relatively high prices. Refining is one of many capital-intensive industries. This type of industry is characterized by large dollar expenditures in capital equipment and relatively small dollar expenditures in operating costs. These capital investments take long periods of time to implement and the resulting

⁴ George Horwich and David Leo Weimer. *Oil Price Shocks, Market Responses, and Contingency Planning*. Washington, D.C.: American Enterprise Institute, 1984, 101.

⁵ Robert T. Deacon and Jon Sonstelie. "Rationing by Waiting and the Value of Time: Results from a Natural Experiment." *Journal of Political Economy*. 93.4 (1985) : 639.

⁶ H.E. French III and William C. Lee. "The Welfare Cost of Rationing-by-Queuing Across Markets: Theory and Estimates from the U.S. Gasoline Crises." *The Quarterly Journal of Economics* February 1987: 107.

capacity can remain active for many decades. As such, firms must plan investments a long time in advance of their actual implementation and they frequently cannot know whether their competitors are going to make similar investments at the same point in time. These long lead times often cause an industry to cycle between periods of capacity constraints where profit margins may be high and thus encourage investment to periods of excess capacity where investors are unable to recoup their capital. The risk that accompanies cyclical profits means a higher cost of financing these large capital projects for the refineries.

The ability to recover capital investment at any point in time is highly dependent upon the real time level of excess capacity in the market. During periods of large excess capacity, refiners will bid down margins close to operating costs, recovering only part of their fixed costs and thus realizing relatively small margins and contributions towards capital recovery. Therefore, the long term profitability of the industry is dependent upon relatively short periods of time when capacity is tight and margins are robust in order to offset the long periods of excess capacity with low or negative margins.

Figure 1 shows that the major oil companies, which comprise the Financial Reporting System Survey (FRS)⁷, had lower returns than the average for U.S. manufacturing through the 80s and 90s.⁸ This lack of profitability has led to concerns about whether there will be sufficient investment to provide adequate capacity to meet product demand, cover occasional refinery outages and regional supply interruptions, and avoid increasing dependence on product imports.

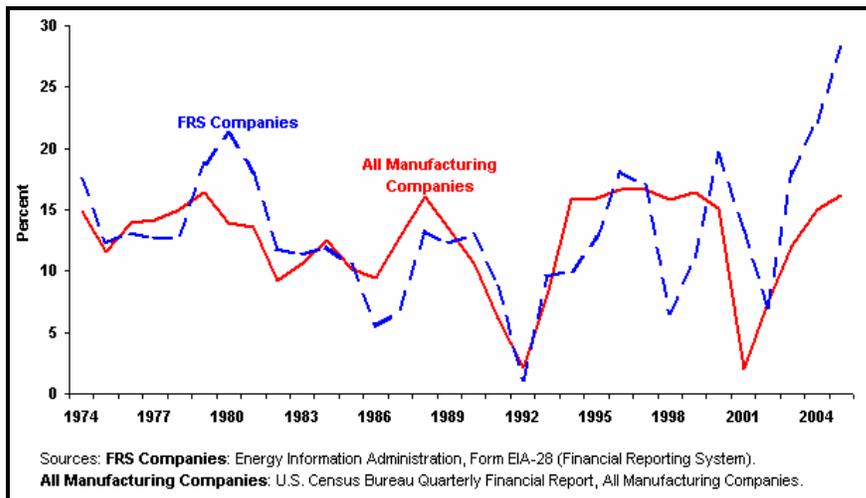


Figure 1. Return on Stockholders' Equity for FRS Companies and All Manufacturing Companies, 1974-2005⁹

Figure 2 shows that U.S. refinery return on investment (ROI) has historically been lower than other FRS companies lines of business, and thus even further below other U.S. industries.

⁷ List of 2005 FRS companies: http://www.eia.doe.gov/emeu/perfpro/about_frs.htm

⁸ FRS companies' return on stockholder's equity was on average 0.8 percentage points less than all manufacturing companies during the 80s and 90s.

⁹ <http://www.eia.doe.gov/emeu/perfpro/fig06.htm>

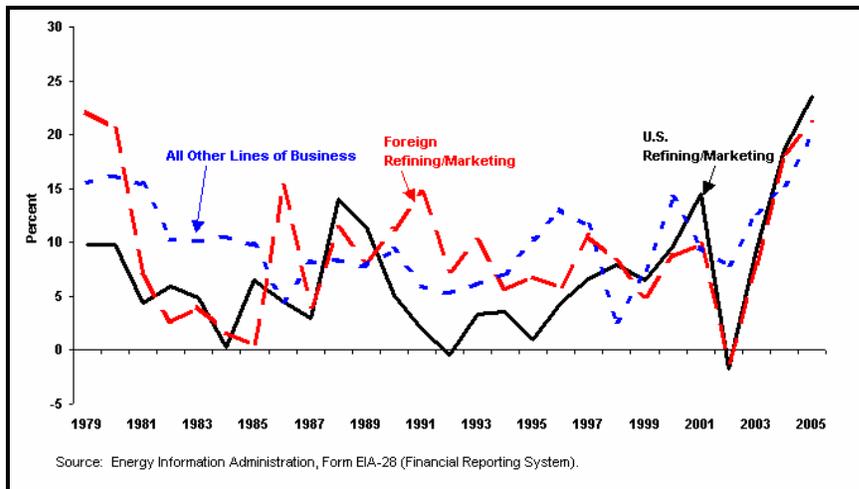


Figure 2. Return on Investment in U.S. Refining/Marketing and all Other Lines of Business for FRS Companies¹⁰

Low profitability has been caused by the cyclical character of the refining industry (Figure 1), with long periods of excess capacity and depressed margins alternating with occasional periods of tightness and elevated margins (Figure 3). Note that in Figure 3, the net margin, equal to the difference between gross margin and operating costs, is very small. It is this margin that must provide a return on investment. More recent data indicate that the net margin fell close to zero as recently as September – October 2006 and February – March 2007.¹¹

Only recently has refining capacity become tight, largely due to six factors:

- Growing demand
- Regulations on fuel quality and sulfur content that require additional processing and eat up capacity
- Elimination, due to product liability lawsuits and bans in some states, of use of an additive, MTBE, that helped to stretch capacity
- Difficulties of siting and licensing new facilities due to environmental restrictions
- Tighter world gasoline markets, raising the cost of gasoline imports
- Restrictions on ethanol imports that prevent access to economic supplies

¹⁰ <http://www.eia.doe.gov/emeu/perfpro/fig22.htm>

¹¹ Ana Campoy, "Refiners Cash In on High Gasoline Prices --- In Shift, Processors See More of Profit Windfall Than Producers of Oil," The Wall Street Journal, 18 May 2007

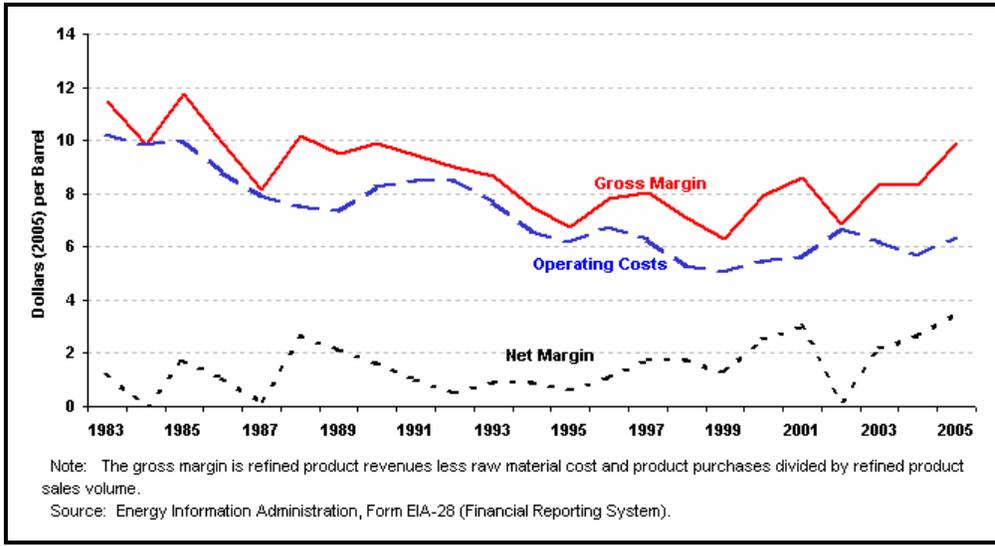


Figure 3. U.S. Refined Product Margins and Costs per Barrel of Petroleum Product Sold for FRS Companies, 1983-2005

The incentive for expansion in a cyclical industry like refining comes from profits earned during the periods of tight capacity, which provide almost all of the return on capital that justify investment. During periods of depressed prices, which have followed surges of investment, refiners’ margins may only be sufficient to cover variable operating costs and contribute little to recover of the investments made earlier. The overall return on investment can only recover if margins during the isolated periods of profitability rise above the level that would be required on a sustained basis.

This is illustrated in Figure 4, which compares the margins required during intermittent periods of elevated prices to the margins that would be sufficient if there were no cycles in profitability. The cross-hatched area between the lines labeled “variable cost” and “long run marginal cost” represents the margin that would be required if prices and costs were constant to provide the required return on investment. The irregular line labeled “cyclical price” shows a typical pattern of prices. When the cyclical price exceeds long run marginal cost, the shaded area provides a margin greater than required to achieve a normal return to capital, and when the cyclical price is below the line the shaded area represents a margin less than required for full recovery of capital investment.

For illustration, assume that the entire cross-hatched area represents the margin that must be collected over the life of a refinery to provide its required return on investment. The “cyclical price” line is constructed so that the difference between the positive and negative shaded areas provides exactly the same net revenue. The areas labeled “windfall profits” would not be earned if there were a price cap set at “long run marginal cost.” These so-called windfall profits (areas labeled with a “+”) are in fact required if refiners are to receive a normal return on their investments, because they make up for lack of return to capital during periods when prices fall to variable cost (areas labeled with a “-”). Even a price cap set a long run marginal cost, which would be relatively generous by the

standards of actual proposals, would still prevent refiners from expecting to earn, over the life of the refinery, margins large enough to justify new investment.

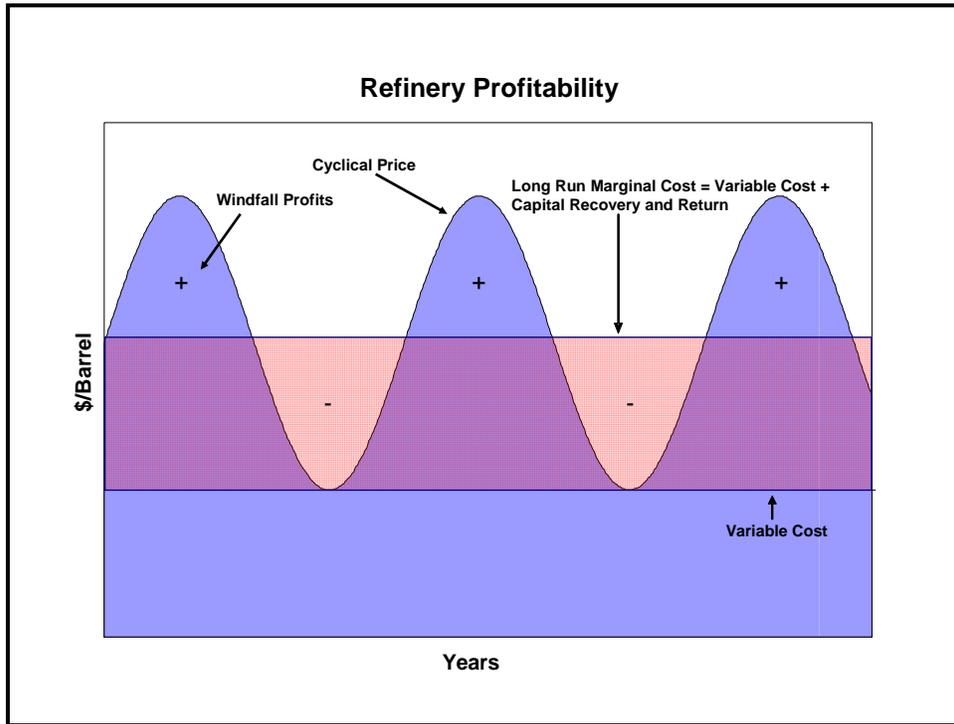


Figure 4. Refinery Profitability Depends On “Windfalls”

It is only if they expect to receive prices (net of taxes) above cost during periods of tightness that refiners can rationally expect to earn an adequate return on refining investments. It is the nature of a capital intensive; commodity industry like refining that there will be slack periods when excess capacity drives prices down to variable cost. Cumulative margins earned during slack periods are insufficient to provide normal returns on investment, because those margins rarely contain any recovery of capital at all. Policies toward refined product markets that cut off the upside for margins, even if they are cost based and allow recovery of capital charges as well as operating costs, thereby eliminate the prospect of earning sufficient margins to compensate for periods when there was no return to capital. Refiners have no safety net to avoid losses (relative to margins sufficient to provide a return on capital) during slack periods, and limits to cost-based prices would prevent them from recovering during tight periods. The result of policies that prevent free movement of prices for refined products would therefore be to lower the expected return on refining to levels too low to justify additional investment.

The long term consequences of this policy shift would be to bring about exactly the problems outlined above:

- Growing dependence on product imports from overseas.
- Lack of sufficient capacity to avoid periodic shortages when refinery outages occur.
- Lack of sufficient capacity to respond to regional supply interruptions.

Since gasoline price controls were removed, the market system has worked extremely well to move gasoline supplies to where they were needed and avoid gasoline lines and serious economic disruptions. That market response required more than price signals that revealed where products were needed; it also required sufficient capacity to respond at relatively low cost. Reducing incentives for refinery investment could tighten that capacity permanently, reducing the alternatives for alleviating shortages and raising costs. If there is no excess capacity, additional supplies can be found for a disrupted region only by prices high enough to discourage consumption. Policies that discourage the investment to create some excess refinery capacity would thereby force prices even higher when interruptions do occur.