

Response to questions to W. David Montgomery from the Honorable Gene Green

Question 1: Dr. Montgomery, you mention in your testimony an experiment California recently undertook to refund to consumers alleged overcharges for gasoline at the pump. Can you further elaborate on this experience and lessons learned?:

Answer: In 1980, due to price controls in effect at the time, Chevron gasoline stations in California were required to sell gasoline at prices \$.16 to \$.21 lower than other stations. As a result, gasoline lines developed at those stations. Two economists, Professors Deacon and Sonstelle, interviewed the motorists to determine the average time they waited and amounts purchased, in order to estimate the value of time that they spent in line to obtain the lower priced gasoline. Deacon and Sonstelle concluded that just the value of time spent in line wasted about half of the cost savings available from the cheaper gasoline.¹

Question 2: You mention a study by two economists on this event that found the added costs associated with price controls were 116 percent of the monetary savings provided by price control. How did this study come to this conclusion, and what does this teach us about interfering in the pricing of gas?

Answer: In a later paper, Deacon and Sonstelle applied these findings to estimate how the added cost due to non-market allocation measures compares to the savings to consumers from lower prices. They developed a theoretical model of the kinds of behavioral responses that are caused by price controls, and concluded that several forms of wasteful behavior would be expected. Using data from the California study described in my response to Question 1, they found that in addition to waiting in line consumers increased the amounts purchased on each trip. These wasteful forms of behavior induced by price controls imposed time costs on consumers that were approximately equal to the benefits of lower prices.

The Deacon and Sonstelle model makes the realistic assumption that any purchase requires an expenditure of both time and money. The authors demonstrate that if the market price is controlled below the level that would equate supply and demand, the waiting time for a purchase will increase. If consumers are able to adjust the quantity that they purchase on each shopping trip, the theory further predicts that lines will be longer than if they continued purchasing the same quantity per trip.

Deacon and Sonstelle also develop a method for estimating the impact of price controls on consumers. It is composed of four elements: the additional time expended for waiting, the cost of increasing the amount purchased, the cost of misallocation among consumers who put different values on time, and the saving from the lower monetary price. Using data on willingness to wait in line and other costs derived from their analysis of the gasoline lines that developed when California ordered Chevron to sell gasoline at a discount, they estimated that the added costs associated with price controls were 116 percent of the monetary saving provided by price controls. Thus, in the most

¹ Robert T. Deacon and Jon Sonstelle. "Rationing by Waiting and the Value of Time: Results from a Natural Experiment." *Journal of Political Economy*. 93.4 (1985).

simplified form, price controls convert the transfer of income between buyers and sellers that occurs when price rises into a pure waste of time. The higher payments received by sellers remain in the economy, and flow back to households through higher returns on capital and lower taxes. Time wasted can never be recovered.

Deacon and Sonstelie assume that price controls have no effect on the quantity supplied. When price controls do reduce supply, as would normally be the case with a supply interruption when replacement supplies can be obtained at a cost, there is additional loss to the economy. Moreover, the time cost of buying gasoline must not just be enough to bring down to the level of supply observed in the market during the disruption. It must be enough to bring the level of supply down to the lower level of supply available when price controls prevent economic replacement supplies from being obtained.²

What this paper teaches us is that price controls do not benefit consumers. When there is a limit on available supplies, some mechanism must allocate those supplies among the consumers that want them. Price increases serve this function efficiently, by leading those who value the use of gasoline to reduce their use until demand equals available supply. With price controls, something else must reduce demand to equal available supply. That something else is the time wasted sitting in line. To reduce demand to equal available supply, the time cost of waiting must be high enough to reduce demand by the same amount that increases

Question 3: In Mr. Slocum's testimony (from Public Citizen), he states that "major oil companies are not building new refineries because it is in their financial self-interest to keep refining margins as tight as possible." He goes on to ask the question, why can't major oil companies build a new refinery today to meet demand? How would you respond to his question?

Answer: There is no evidence that refiners will show any restraint in building new capacity in order to sustain high prices. Historically, there have been repeated surges of investment in U.S. refining that competed away any increase in margins (see chart). As Mr. Kovacic testified, structurally the refining industry in the United States is highly competitive. Market shares in refining are so small that it would be impossible for any refiner to think that its unilateral decision to refrain from building an otherwise profitable refinery could have a material effect on national gasoline prices.

There are several reasons why we are not seeing additional expansion of refineries. Recently, refiners have had to allocate significant portions of their capital budgets to investments to repair damage from Hurricane Katrina and Rita and meet tighter product quality and emissions regulations. Additional discretionary investments to expand capacity take time to plan and execute, and a temporary spike in prices is not a sufficient economic reason to make those investments. What is required is the confident expectation of continued high demand and at least occasional periods of high margins. Another reason for lack of investment therefore would be the expectation that rising gasoline prices and proposed policies such as caps on greenhouse gas emissions and tight fuel economy standards will reduce demand for gasoline and make additions to capacity

² Robert T. Deacon and Jon Sonstelie. "The Welfare Costs of Rationing by Waiting." *Economic Inquiry*. 27.2 (1989).

unprofitable. Another reason is the tight environmental regulations that raise costs of increasing capacity and severely limit available sites.

The most important reason why no rational refiner would invest in additional capacity is likely to be the current threat of price controls. Price controls eliminate the upside on prices that has been only source of a return on capital investment in U.S. refining in the past 30 years. Passage of price-gouging legislation will therefore virtually guarantee that there will be no additional refining capacity built in the United States.

It is only if they expect to receive prices 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. Price controls 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 cost-based controls would prevent them from recovering during tight periods. The result of creating an expectation of price controls would therefore be to lower the expected return on refining to levels too low to justify additional investment.