

How Do Low Gas Prices Affect Costs and Benefits of US New Vehicle Fuel Economy Standards?

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Executive summary

Over the next decade, US Corporate Average Fuel Economy (CAFE) and greenhouse gas (GHG) emissions standards are designed to cut new vehicle fuel use and GHG emissions in half. The new standards are controversial, and federal agencies are currently reviewing them. For this review and for the evaluation of possible new regulations in the next few years, it will be important to have an accurate approach to measuring the full costs and benefits of the policies.

The National Highway Traffic Safety Administration (NHTSA) sets standards for fuel economy and the US Environmental Protection Agency (EPA) sets standards for GHG emissions. Both agencies have evaluated the costs and benefits of the regulations, but their assessments do not include the effects on vehicle consumers and manufacturers of unexpected changes in gasoline prices. Gasoline prices can affect the vehicles consumers choose—such as the mix of cars and trucks—as well as how much people drive. These effects have complex implications for the benefits and costs of the standards.

In their initial benefit–cost analysis of the 2012–2016 passenger vehicle fuel economy standards, the US regulatory agencies estimated that the benefits of the standards would be three times greater than the costs. However, their analysis was based on the high gasoline prices forecasted at the time; after their analysis, expected gasoline prices fell by 25 percent. We augment the agencies' benefit–cost framework and use recent evidence on behavioral responses to gasoline prices to estimate the effects of low gasoline prices on the benefits and costs of the standards.

We account for both consumer and manufacturer behavioral responses to gasoline prices. On the consumer side, we account for the fact that lower gasoline prices result in more miles driven because of the lower cost-per-mile of driving. Lower prices also cause consumers to choose vehicles with lower fuel economy. On the manufacturer side, the fuel economy and GHG standards depend on vehicle size as well as class (car or light truck). Because lower gasoline prices cause consumers to buy larger vehicles and more light trucks, lower gasoline prices affect the level of fuel economy the standards require and the costs to manufacturers of meeting the

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requirements. The objective of the research is to quantify the implications of these effects for the benefits and costs of the standards.

Similar to the approach used by the agencies, we estimate benefits and costs by comparing a scenario with the new standards and a scenario that holds the standards fixed at their 2011 levels. We examine the effects of low gasoline prices by comparing benefits and costs under high and low gasoline price scenarios.

We look at how gasoline prices affect GHG emissions reductions and fuel cost savings resulting from a tightening of the standards. We account for consumer responses to lower gasoline prices in vehicle choice by drawing on evidence from a statistical model that links a vehicle’s fuel costs to its market share. We also account for the additional driving caused by lower gasoline prices, again drawing on recent estimates in the literature. We calculate fuel savings and GHG emissions reductions over the life of each vehicle, both for the high and low gas price scenarios, and with and without the tighter standards.

Lower gasoline prices also raise compliance costs for manufacturers. For reasons explained in the paper, low gasoline prices create a 0.2 mpg gap between the fuel economy consumers choose and the fuel economy manufacturers must attain. Using available data from the agencies, we estimate the cost of increasing fuel economy to close this gap. The table below summarizes our findings. The first row shows the additional costs incurred to attain the standards. The change in benefits includes two components: the decrease in the value of fuel savings and the increase in CO2 benefits. The change in fuel cost savings dominates the changes in costs and CO2 benefits, and overall, net benefits fall by about \$6 billion.

Table: Summary of Effects of Lower Gasoline Prices on Costs and Benefits of the Standards (millions of 2007\$)

	Effects of lower gas prices on 2015 cars and light trucks
Change in costs	\$555
Changes in benefits	
Change in value of fuel savings	-\$5,736
Change in CO2 benefits	\$283
Change in benefits net of costs	-\$6,008

Source: Own illustration.

Summary: We analyze the effect of a 25 percent reduction in future gasoline prices on the benefits and costs of fuel economy and GHG standards for new light duty vehicles. We extend the approach used by the agencies in their assessment of costs and benefits by accounting for the effects of gasolines prices on consumer and producer behavior. We find that these behavioral responses are small relative to the reduction in fuel savings from the gasoline price decline. But they are not insignificant. Of the behavioral responses, consumer changes in vehicle choice had

the largest effect. Lower gasoline prices raise compliance costs by about \$0.5 billion per year, or about 9 percent of the total net benefits of the program. This analysis represents important steps for incorporating consumer and manufacturer responses into analysis of the costs and benefits of fuel economy regulations.