
Should Fuel Economy Standards Be Raised?
IAN W.H. PARRY

With every shift in the geopolitics of oil and accompanying spike in gasoline prices, the public call goes out to increase the fuel economy standards for new passenger vehicles. Domestic energy security and global climate change are the two rationales most frequently cited. A 2002 report by the National Academy of Sciences underscored the feasibility of achieving a substantial improvement in vehicle fuel economy and documented a wide array of emerging fuel-saving technologies that might pay for themselves in terms of fuel savings over the vehicle life.

But despite all the rhetoric, recent regulatory proposals have been modest. The standard that each manufacturer must meet, on average, for its sales of light-duty trucks (sport utility vehicles, minivans, and pickups) is being increased from 20.7 to 22.2 miles per gallon by 2007. And if a recent administration proposal is adopted, the standard will be further increased to 24 miles per gallon by 2011. Even so, the resulting fuel economy improvements from these changes would ultimately reduce our total oil use by only around 3 percent. Meanwhile, the standard for cars, currently 27.5 miles per gallon, has not been raised since 1990. In fact, due to the rising share of light-duty trucks, which now account for half of new vehicle sales, fuel economy averaged across all new passenger vehicles is still below its peak level achieved in 1987 (see the figure on page 19).

Does all this mean there is a solid economic case for a substantial tightening of the car and light-truck standards, if only the political will was there? The answer, surprisingly, is not at all clear cut; in fact, the debate over fuel economy standards may detract from more pressing policies to address energy security and environmental concerns.

Energy Security

The United States currently imports 57 percent of the oil it consumes, and this share is projected to grow to around 70 percent by 2025. Growing dependence on foreign suppliers is not a problem in and of itself, if it is less costly to meet additional oil needs through overseas purchases rather than by producing extra oil at home. The concerns about oil dependency really boil down to the vulnerability of our economy to energy price shocks and the possibility that oil profits earned in certain other nations may be undermining U.S. foreign policy and national security interests.

On closer inspection, it is not immediately obvious why oil price volatility warrants government regulation of private markets. Presumably some individuals and many businesses are well aware of oil price volatility and the risk that gasoline prices may rise in the future. It makes sense for them to take this risk into account when deciding how much to invest in energy-saving technologies and fuel choices, and when choosing among vehicles with different fuel economies. If markets work efficiently in terms of supplying energy-saving technologies demanded by consumers and firms, and the government is no better informed than the private sector about the risks of price volatility, there seems little basis exists for government intervention to alter private-sector decisions.

But perhaps private markets do not adequately account for the risks to the broader economy from oil price shocks. For example, a sudden jump in prices at the pump might push the economy into a recession when, to help pay for expensive gasoline, households reduce their demand for other goods causing other people to lose their jobs.

A further type of market failure has to do with market power issues rather than oil price volatility: higher demand from U.S. importers as a group may bid up the world price of oil, which in turn raises the nation's total import bill. Individual motorists and firms do not consider this price effect when deciding how much fuel to consume. However, the ability of the United States to influence world oil prices is unclear, as it depends on how the Organization

Higher fuel economy standards may fail a cost–benefit test, unless consumers greatly undervalue fuel economy, which is an open question. We are left with either rationalizing standards in other ways, for example on political rather than economic grounds, or considering alternative policy options.

of Petroleum Exporting Countries (OPEC) and other oil-producing nations respond to changes in U.S. imports.

Energy economists have attempted to estimate the cost to the nation resulting from both market power issues and the risk of macroeconomic disruptions from price volatility. Perhaps the best is a 1997 Oak Ridge National Laboratory study that put the combined costs at the equivalent of around 12 cents per gallon of gasoline. The main difficulty with these types of studies is forecasting the risk of future price shocks. These may have risen in recent years with elevated risks of terrorist attacks on oil supply infrastructure and possible regime change in Saudi Arabia (the swing oil producer) as well as pressure on the oil market from demand growth in China and other developing nations.

A broader, noneconomic concern about our thirst for oil is that it may be, inadvertently, counterproductive to the Bush administration's twin goals of furthering democracy abroad while strengthening security at home. Buoyant oil revenues may have emboldened Russia in its crackdown on democratic freedoms because they reduced the country's vulnerability to any threat of Western sanctions; similarly, surging oil profits may have encouraged Iran in its pursuit of nuclear weapons capability. In addition, oil dollars may ultimately end up funding terrorist groups. All these types of costs are especially difficult to put a price tag on.

However, we do not have as much leverage to curtail these revenue flows through regulating our automobiles as we would like. Suppose, for example, that over the next decade or two, we managed a substantial boost in passenger vehicle fuel economy from its current average of around 24 miles per gallon to 36 miles per gallon. This would reduce U.S. oil imports by roughly a quarter, which might lower the world oil price by around 3–6 percent, or $1.80–$3.60 per barrel at current prices of $60 per barrel. This reduction counts for something but is modest when set against the recent tripling of world oil prices.

Yet another issue is the expense, and human suffering, from U.S. military deployment in the Middle East, which has escalated enormously since the war in Iraq. However it is questionable how much money and how many casualties are attributable to the protection of oil supplies as opposed to other objectives, such as the promotion of stability and democracy in the region. Pacification of the Sunni triangle or a Palestinian-Israeli deal over Jerusalem and the West Bank will more likely determine when and how many troops come home than a modest reduction in U.S. oil imports.

Climate Change

Yale University economist William Nordhaus has taken on the daunting task of attempting to value the potential damages from future, human-induced global climate change, which involves assessing, among other things, the costs to agriculture, forestry, fishing, etc., as well as the costs of protecting valuable coastal regions against sea-level rise. This task also involves inferring how many resources countries might be willing to sacrifice to preserve ecosystems or avoid the spread of tropical diseases. Estimating these costs is challenging enough because of the paucity of studies for other countries, which means costs must often be extrapolated from U.S. studies. But the most contentious issue, and the one that accounts for the lion's share of Nordhaus's estimates, is the unknown

possibility of *abrupt, catastrophic* climate change, such as a disruption of the Gulf Stream that would (paradoxically) freeze northern Europe. Here, Nordhaus had to rely on the subjective views of experts on the likelihood, at different levels of warming, of a catastrophic event that would wipe out a large portion of world GDP.

Recent reviews of Nordhaus's work and other studies have put the damages from today's carbon emissions at roughly $30 per ton. This figure is equivalent to about 120 percent of the 2003 price of coal but just 7 cents per gallon of gasoline, since a gallon contains only 0.0024 tons of carbon. Not surprisingly, this $30 estimate is controversial given scientific, social, and political uncertainties, such as vulnerability of poor countries to climate change and the morality of current generations assessing the value of the environment for future generations. Nonetheless, one conclusion is unavoidable: according to economic models, most of the low-cost options for reducing carbon emissions are in other sectors, particularly substituting other fuels for coal in electricity generation, not in gasoline conservation.

Implications for Fuel Economy Policy

Summing up, the combined damages from oil dependency and carbon emissions that have been quantified seem to suggest, albeit tentatively, a ballpark estimate of around 20 cents per gallon of gasoline (the National Academy of Sciences panel assumed a larger figure of 24 cents per gallon). Now to the harsh realities of economics. The best way to address these costs would be to make fuel users pay for them through fuel taxation; that way, individuals would take these costs into account when deciding how much to drive, whether to buy a car with higher fuel economy, and so on. But we already have gasoline taxes imposed at the federal and state level that average about 40 cents per gallon—well above our estimate of oil dependency and carbon damages. Basic economic analysis shows that if people are already paying more than the full social costs of fuel use, a policy that further reduces fuel use, such as tighter fuel economy standards, will cause an overall economic loss to society, despite the climate and energy security benefits.

Many people will feel that there must be something wrong here. One possibility is that the damage estimates discussed above are missing something important, are flawed in some other way, or may turn out to be higher in the future as oil production becomes more concentrated in the Persian Gulf or if global warming occurs faster than expected. We need to keep an open mind about these possibilities, which will not be resolved until more evidence on these issues becomes available.

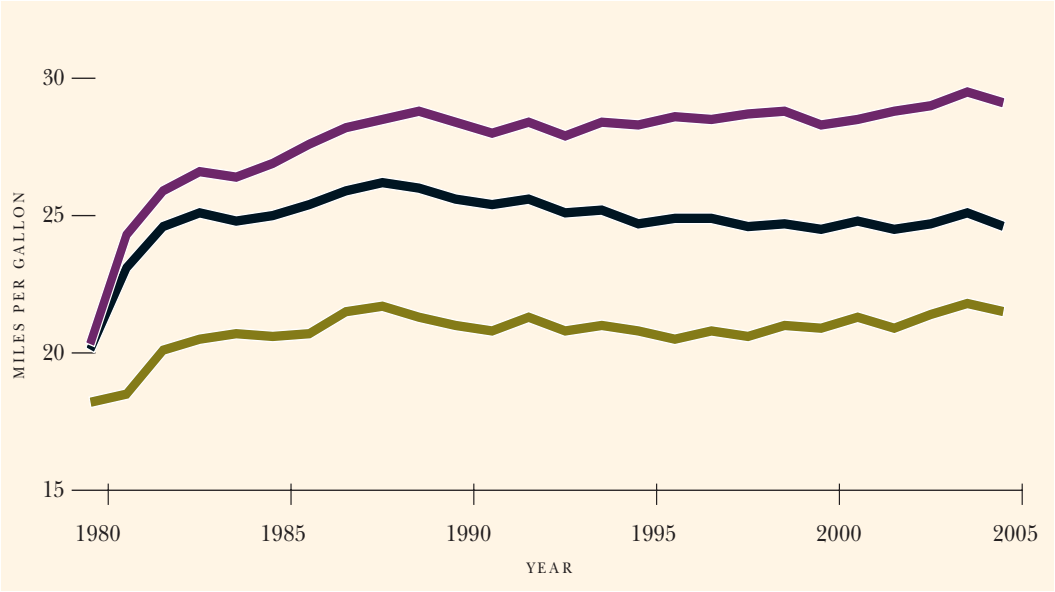
Another response might be that gasoline is under- rather than over-taxed if we take into account the other social costs of driving, such as traffic congestion and accidents. However, unlike higher gasoline taxes, higher fuel economy would slightly increase the amount vehicles are driven and add to congestion and accidents, rather than reducing driving, because it lowers fuel costs per mile (as opposed to a gasoline tax, which raises driving costs). Accounting for the perverse effect on driving further increases the net costs of higher fuel economy standards.

A third response might be that since gasoline tax revenues help pay for highway expansion and maintenance, shouldn't the benefits of this spending figure into the analysis? In principle, yes, but this does not undermine the argument. Higher fuel economy standards lead to lower gasoline demand and lower tax revenues; to the extent that this crowds out socially desirable highway spending, the net cost of reducing gasoline demand is larger not smaller.

Finally, even if we accept the above damage estimates as the best available, there is still great uncertainty surrounding them, not least the possibility of future catastrophic climate changes. But given that, according to the National Academy of Sciences study, the costs of significantly raising vehicle fuel economy are not too burdensome and perhaps could be negative when fuel savings are considered, surely we have little to lose from insuring against climate and energy security risks by boosting fuel economy?

Even this seemingly sensible argument is open to question. If it really is the case that emerging technologies exist that will pay for themselves in terms of fuel savings, then it follows that because consumers should be willing to pay higher vehicle prices for them, these technologies should be incorporated over time by vehicle manufacturers. The growing popularity of hybrid vehicles suggests that at least some households are happy to pay more for a vehicle that saves on fuel costs. If pump prices in excess of $2 per gallon persist for the foreseeable future, tighter fuel economy regulations may have little or no effect over what the market would do on its own.

Another possibility is that the true economic costs of deploying fuel-saving technologies are greater than just the added costs to vehicle manufacturers, as estimated by the National Academy. This would be the case if, by using technologies to improve fuel economy, other vehicle enhancements that might have been made with the new technologies are sacrificed. During the 1990s, for example, many new technologies were used to improve vehicle horsepower; if regulations had forced them to instead be used for improving fuel economy, significant costs would have been imposed on vehicle buyers.



Fuel Economy of New Passenger Vehicles

Cars

Average

Light Trucks/SUVs

Source: National Highway Traffic Safety Administration.

Yet another possibility is that the market simply fails because consumers don't place a high value on fuel economy and, as a result, manufacturers are unwilling to invest in fuel-saving technologies. For example, many auto industry experts believe that consumers only count the fuel savings from better fuel economy over the first 3–5 years, rather than the expected 14-year lifespan of the vehicle. If so, there is another potential justification for fuel economy regulations, as they force manufacturers to incorporate technologies that are worthwhile from society's perspective (even ignoring climate and energy security benefits) and that would not be adopted in the absence of regulation. Whether consumers do or do not undervalue fuel savings in this regard is much disputed among economists and engineers; unfortunately, there is little solid evidence on this issue either way.

To be blunt, higher fuel economy standards may fail a cost–benefit test, unless consumers greatly undervalue fuel economy, which is an open question. We are left with either rationalizing standards in other ways, for example on political rather than economic grounds, or considering alternative policy options.

Alternative Strategies

Thinking beyond the fuel economy debate, two hard truths should be recognized. First, any attempt to cut back on oil use or carbon emissions should focus on the economy as a whole. It makes no sense to focus exclusively on automobiles when the huge bulk of the low-cost opportunities for carbon reduction lie in power generation. Similarly, oil should be conserved by taxing all of its products, including aviation fuel, home-heating oil, diesel fuel, and petrochemicals, not just the 45 percent of oil that is refined into gasoline.

Although imposing moderately scaled taxes on all oil uses—and on the carbon content of all fossil fuels—makes a lot of sense, the second hard truth is that these measures by themselves will not take us very far in alleviating energy security and climate concerns. The heart of the matter is whether we are able to develop and deploy technologies in the United States and throughout the world that enable a transition away from traditional fossil fuels, or at least prevent their emissions from escaping into the atmosphere, without seriously damaging economic growth. To what extent this transition materializes over the next generation or two depends on technological possibilities and factors that motivate firms, governments, and academic institutions to explore alternatives to traditional fossil fuel technologies, particularly the level of fuel prices—including energy taxes—and government policy toward R&D. In this regard, the architects of the Energy Policy Act of 2005 deserve a little credit for providing some incentives for technological advance. ■

Further Reading

Leiby, Paul, Donald Jones, Randall Curlee and Russell Lee. 1997. *Oil Imports: An Assessment of Benefits and Costs*, Oak Ridge, TN: Oak Ridge National Laboratory, ORNL-6851.

National Academy of Sciences. 2002. *Effectiveness and Impact of Corporate Average Fuel Economy (CAFE) Standards*. Washington, DC: National Academy Press.

Nordhaus, William D., and Joseph Boyer. 2000. *Warming the World: Economic Models of Global Warming*. Cambridge, MA: MIT Press.

Parry, Ian. 2002. "Is Gasoline Undertaxed in the United States?" *Resources* 148: 28–33.

The author is grateful to Sarah Beam, Joel Darmstadter, Felicia Day, Richard Newell, Phil Sharp, and Robert Weiner for very helpful comments on an earlier draft.