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Americans, Cars and Fuel Economy (and Economists)

One striking cultural difference between Europeans and Americans involves their relationships with their cars. Europeans can't imagine commuting to work in a Hummer any more than Americans can imagine cramming themselves into a SmartCar when the kids have to be taken to soccer practice (I mean, football, but that's another cultural difference). While most vehicles on both continents come in sizes between these extremes, it is undisputed that Americans drive more, own more cars, and that those cars are much less fuel efficient. But why is that so, and what are policy makers doing about it?

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Since the turn of the century when Henry Ford developed the assembly-line method for mass-producing cars at affordable prices, Americans have become reliant on the automobile. While European cities and towns were already well established when the automobile was invented, large parts of the United States developed alongside the automobile, and this interdependence has resulted in land-use patterns that take advantage of and reinforce the need for cars. Thus, although the U.S. is twice as densely populated as Norway, Americans own 50% more passenger cars per capita, while the Norwegian car ownership rate is only slightly higher than that in much more densely populated Europe.[1]

Over the past century, passenger vehicles have evolved a great deal in terms of weight, safety and comfort features, but not in fuel economy. Henry Ford's Model T, introduced in 1908, got 13-21 miles per gallon (city-highway);[2] today, the popular Ford Explorer also sports a V8 engine, albeit an improved one, but at nearly three times the curb weight, it gets about the same mileage.[3]

Weight is a big part of the story of trans-Atlantic vehicle differences; American cars are almost 50 percent heavier on average. The rest of the difference in fuel economy can be explained by the fact that Europe relies

1: Source: World Resources Institute Earth Trends, *United Nations Statistics Division Demographic Yearbook*, and the *World Bank Group World Development Indicators 2006*.

2: Ford Motor Company. "Model T Facts," http://media.ford.com/article_display.cfm?article_id=858

3: www.edmunds.com

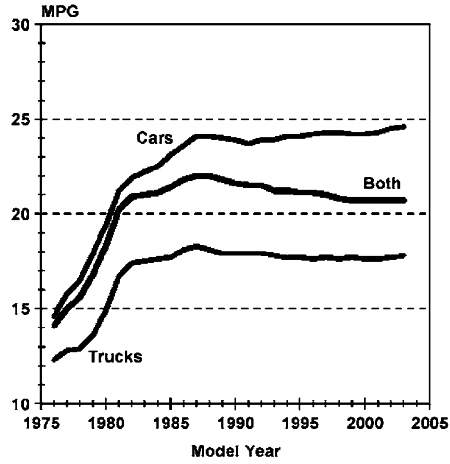
much more on diesel-powered cars, and that official test cycles differ.[4] Thus, the question does not seem to be one of differences in sophisticated technologies, but rather differences in consumer preferences.

Why are consumer preferences so different? Land-use and transit options are one issue, but economists will point to another: gasoline prices. Compared with the US, Europe imposes much heavier taxes on petrol (seven times heavier in the UK, for example), resulting in prices at the pump that are more than double those paid by their American counterparts.[5]

Still, recent increases in oil prices, concern about energy security, and apprehension over global climate change have turned attention to fuel economy policy. In the U.S., the primary mechanism is the set of Corporate Average Fuel Economy (CAFE) standards. Paralleling current concerns, Congress was worried in 1975 about increasing imports of crude oil, especially from politically and militarily unstable parts of the world. One response was the Energy Policy and Conservation Act of 1975, in which Congress mandated for the first time that passenger cars and so-called light-duty trucks (pickup trucks, minivans, and sport utility vehicles) had to meet fleetwide CAFE standards. Congress itself set the target for passenger cars at 27.5 miles per gallon (mpg), nearly double the pre-1975 average. (That translates into 8.6 liters per 100 kilometers.) The National Highway Traffic Safety Administration (NHTSA) was assigned the responsibility of setting fuel economy targets for light-duty trucks, which now stands at 20.7 mpg, nearly a 50 percent increase over 1975, and is due to increase to 22.2 mpg by 2007.

Working in concert with sharply increasing gasoline prices in the early years of the program, the CAFE standards resulted in significant improvements in fuel economy for passenger cars and light-duty trucks alike. As a consequence of conservation measures in transportation and other sectors, between 1977 and 1986, imported oil fell from 47 percent to 27 percent of total oil consumption. However, since 1986, fuel consumption rates have been rising again due to a combination of low gas prices, the plateauing of fuel economy standards, and a general shift from cars to sport utility vehicles (SUVs), which fall into the light truck category and are subject to less

Adjusted Fuel Economy by Model Year
(Three-Year Moving Average)



Source: USEPA (2005) "Light-Duty Automotive Technology and Fuel Economy Trends: 1975 Through 2004"

4: Presentation by Dr. Simon Godwin, DaimlerChrysler, to the Center for Transatlantic Relations, October 20, 2004.

5: The Automobile Association compares gasoline prices around Europe and the US: http://www.aaroadwatch.ie/eupetrolprices/default.asp (accessed October, 2006).

stringent fuel economy standards. The recent spike in gasoline prices has prompted a public call for an increase in CAFE standards—and possibly a reform of the program.

One important feature of the current CAFE program is that it requires each manufacturer separately to meet the standards for each of its own car and light truck fleets. Many economists point out that the program would be more cost-effective if manufacturers were allowed to trade CAFE compliance credits, much like in Europe companies can trade carbon permits or green certificates.

To understand the benefits of trade, we should recognize that with an alternate means of compliance, some carmakers might prefer to specialize in the large-vehicle segment of the passenger car or light-duty truck markets because of a comparative advantage they feel they have in manufacturing or marketing such vehicles. They cannot do so now; if an automaker is able to sell 1 million passenger cars that average 26 mpg, it has to sell another million such vehicles averaging 29.2 mpg in order to hit the 27.5 mpg standard. This has resulted in a situation in which at least some carmakers end up producing and selling for little or no profit (or even at a loss) significant numbers of smaller cars or light-duty trucks to enable them to produce the larger cars or trucks on which they make their money. They may also find it easier to convince consumers to buy SUVs than to increase the fuel economy of station wagons, which are subject to the car standard.

Because fuel is fuel, no matter what kind of vehicle burns it, this system makes little sense. If fuel economy credits were fully tradable, an automaker would have another option open to it. If it could not profitably compete in the small car (or light-duty truck) market, it could use any fuel economy credits that it had generated in the other segment of the new vehicle market, or it could purchase credits from another automaker that had exceeded its passenger car or light-truck targets in a previous year. Automakers purchasing credits would be those that find it difficult to manufacture and sell enough smaller vehicles to offset their large-vehicle sales. The automakers choosing to sell credits would be those for which exceeding the standard is less expensive than purchasing credits. Both companies would benefit from the exchange. Furthermore, lower manufacturing costs from better specialization and more effective allocation of technologies for fuel economy will translate into lower prices for consumers. Meanwhile, the overall fleet of passenger vehicles will meet the same fuel economy goals.[6]

While economists support making CAFE standards tradable, there is still no clear consensus on whether the benefits of raising those standards would actually outweigh the costs. Incorporating technologies to improve fuel economy entails its own costs, either in terms of the price of the vehicle or in tradeoffs with other features that consumers may value more, e.g. horsepower or acceleration. Furthermore, while fuel economy improvements would lower overall fuel consumption, they also lower the cost of driving. The resulting 'rebound effect' not only eats up some of the fuel savings, but it also generates more congestion and accidents, which

6: For more information, see Fischer, C. and P. Portney (2004) "Tradable CAFE Credits," in *New Approaches on Energy and the Environment: Policy Advice for the President*, Richard D. Morgenstern and Paul R. Portney, Ed. Washington, DC: RFF Press.

are costly. And, since tailpipe emissions are regulated on a per-mile basis, conventional air pollution increases with miles traveled, so improving fuel economy can in theory deteriorate air quality in some areas. Although the rebound effect is relatively minor, these costs all weigh against the benefits. Many economists note that if the sought-after benefits are reductions in greenhouse gas emissions or oil security costs from gasoline consumption, there is already a gasoline tax to compensate for them. Furthermore, since autos account for only 20% of US carbon emissions, and 45% of oil use, broader policies would be more cost-effective for combating these problems.

Ultimately, whether the benefits of fuel economy regulation outweigh the costs is crucially dependent on whether consumers 'value' fuel economy. If they 'rationally' recognize the fuel savings they will achieve, they will be willing to pay for improved fuel economy, making manufacturers want to offer it, and regulation is unnecessary. If, despite this recognition, other vehicle features are more important than fuel economy, then regulation can impose a significant burden on consumers in the form of less desirable cars. However, some argue that consumers do not fully value potential fuel savings when they make their auto purchase decisions, due to the difficulties of such calculations and the relative importance of other features. If consumers are not willing to pay more for fuel-saving technologies, then manufacturers will be unwilling to invest sufficiently in them. In this case, fuel economy regulations can be justified in their own right (even ignoring climate and energy security benefits), as they force manufacturers to incorporate technologies that are worthwhile from society's perspective and that would not be adopted in the absence of regulation. However, little solid evidence exists on the extent to which consumers value or undervalue fuel savings.

In general, economists on both sides of the Atlantic will argue that problems should be tackled as directly as possible, using mechanisms that signal the costs to society, but allow markets the flexibility to respond in the most cost-effective manner. The costs of greenhouse gas emissions from driving are best signaled by a carbon tax on the fuel. The costs of congestion can be signaled by tolls. Other costs, such as accidents or conventional air pollution, which accrue with miles traveled, can be addressed by a per-mile charge (indeed, some advocate making auto insurance paid by the mile). Fuel economy regulation may help curb oil consumption, but from an efficiency standpoint, it is best designed to improve the choices of consumers—assuming they need some help.[7]

7: For more information, some additional non-technical and technical papers are available at http://www.rff.org. See, e.g., Parry, Ian W.H. (2005) "Should Fuel Economy Standards Be Raised?" *Resources* 159 (Fall issue): 16–19, as well as Parry, I.W.H., C. Fischer and W. Harrington (2004) "Should Corporate Average Fuel Economy (CAFE) Standards Be Tightened?" *RFF Discussion Paper* 04–53.