7 The hidden American tax on imported cars: Fuel economy standards instead of tariffs

Arik Levinson
Georgetown University

As a presidential candidate, Donald Trump proposed a tariff on imported cars.[1] A year later, President Trump has announced plans to re-evaluate fuel economy standards set by the previous administration, presumably to loosen their stringency.[2] Though seemingly unrelated, those two policy proposals are contradictory. The fuel economy standards themselves have a built-in bias equivalent to a tariff on imports ranging from $80 to $200 per car. Loosening the standards would lower those implicit tariffs.

To see why, it is necessary to first understand how the US Corporate Average Fuel Economy (CAFE) regulations work. Since 1978, the Department of Transportation (DOT) has set average miles-per-gallon (mpg) targets for all new vehicles sold in the United States. For most of the 1990s and 2000s, that target was 27.5 mpg. Carmakers could sell lower-performing cars, but their sales would have to be matched by sales of cars achieving higher fuel economy.

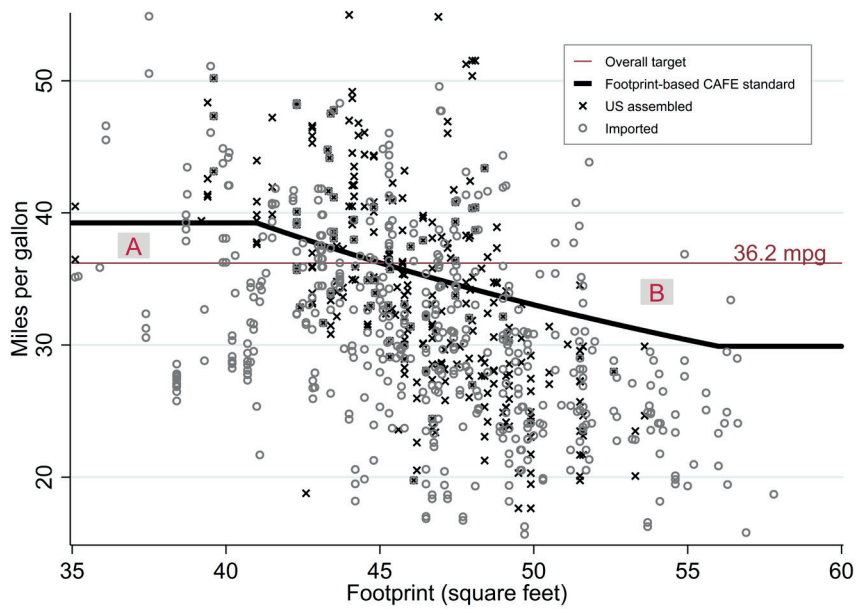
In 2007, Congress directed the DOT to tighten the mpg targets and allow carmakers that fail to meet the tighter targets to buy credits from carmakers that exceed them. And, key to this story, the law required DOT to set the new standards 'based on 1 or more vehicle attributes related to fuel economy and express each standard in the form of a mathematical function.'

1 "Trump proposes 35 percent tax on foreign-produced cars", The Hill September 15, 2016.

2 "Trump Starts Review of Obama-Era Fuel-Economy Rules, Putting Electric Cars in Doubt", Fox Business March 15, 2017.

To comply with that 2007 legislation, starting with model-year 2011, the DOT has been setting targets that differ based on vehicles' 'footprints'– cars' sizes as measured by the area under their four tyres. The mathematical function that DOT chose is complex, but its effect can be seen in Figure 1, drawn for model-year 2015 cars.[3] The left axis reports fuel economy, and the horizontal line at 36.2 mpg represents the overall average fuel economy DOT expects the regulation to achieve. But the actual target carmakers face depends on the footprints of the cars they sell, listed on the bottom axis. The target follows the thick segmented line. New small cars sold in 2015, with footprints smaller than 41 square feet, were required to get 39.24 mpg. But large cars, over 56 square feet, needed to get only 29.9 mpg.

Figure 1. Car models by fuel economy and footprint; model year 2015.



Source: EPA Trends and Auto-News.com. US-assembled refers to cars produced domestically, according to Auto-News.com.

3 The actual formula is: $\text{Target mpg} = 1 \div \left(min\left[max\left(c \times Footprint + d, \frac{1}{a}\right), \frac{1}{b}\right]\right)$ where, for model-year 2015 cars, a=39.24, b=29.90, c=0.0005308, and d=0.003719. The standard gets more stringent each year by raising a and b, and lowering d.

That 2011 change from a flat overall target to a footprint-based standard has resulted in an implicit tariff on imported cars. To show that, Figure 1 plots each make and model car as a point on the graph. Crosses denote domestically assembled cars; circles denote imports. The cars most clearly disadvantaged by the change lie in region 'A' of the graph. Those models would have met an overall mpg target, but fail to meet the footprint-based target. Under a flat target those models could have sold credits to underperforming models. Under the footprint-based target they must buy credits. Most of those newly disadvantaged cars are imports, represented by circles.

Car models most clearly advantaged by the footprint-based CAFE standards are in region 'B'. Those would have failed an overall target and needed to buy credits, but they exceeded the footprint-based standard and could instead sell credits. More of those are US-made.

The change affects all cars, not just those in regions A and B. Each car model's compliance depends on how far above or below the target line it falls. Thanks to the footprint-based formula, US-made cars are closer to meeting their mpg targets, while imports are farther from meeting them. The formula *adds* 0.70 mpg to the average US-assembled car in 2015, relative to the flat fleetwide average at 36.2 mpg. It *subtracts* 0.75 mpg from the average imported car.

How much is this worth? The fine DOT levies on carmakers currently stands at $55 per mpg per vehicle. If we take that as the compliance cost (or, alternatively, as the price of a one-mpg credit), the footprint formula adds $39 worth of extra mpg credits to the average US-made car and subtracts $41 worth of credits from the average import, for a total difference of $80 per car. That's an $80-per-car advantage to American cars provided by the footprint-based CAFE standards.[4]

That US advantage was scheduled to increase steeply in coming years, but the Trump Administration looks ready to reverse that. In July of 2016, before the election, the DOT announced it was raising the fines from $55 to $140 per mpg, mostly as an overdue adjustment for price inflation.

4 In Levinson (2017) I show that this footprint-based advantage applies to all model years, and for alternative definitions of imported cars.

But in December the Agency delayed that increase until the 2019 model year. An increase in the penalties to $140 would increase the footprint-based US advantage to over $200 per car.

Similarly, the Trump Administration's recent steps to delay implementation of stricter standards for model years 2022 to 2025 affects all carmakers. But under the footprint-based formula, US carmakers have less far to go to meet those standards. Taking the 2015 fleet pictured in Figure 1 as a baseline, tighter standards would mean US carmakers have fewer credits to sell, but makers of imported cars would have more to buy.

Though small, the advantage afforded to domestic carmakers by the footprint-based CAFE standards amounts to a form of 'environmental protectionism'. In theory, that's prohibited by international trade agreements like NAFTA and the World Trade Organization. Those agreements have environmental provisions that explicitly forbid countries from weakening environmental rules to favour domestic producers, or designing rules that target foreign producers.

For example, the NAFTA agreement outlaws any environmental regulation that constitutes a 'disguised restriction on trade'. That 'disguised restriction' language parallels text from the earlier General Agreement on Trade and Tariffs, and it appears again in the proposed Trans Pacific Partnership recently abandoned by the US.[5]

Of course, none of this language clearly delineates what constitutes environmental protectionism. Well-disguised trade restrictions might well evade scrutiny. Ederington and Minier (2003) document that US industries with more import competition face less strict environmental regulations. Miravate *et al.* (2016) and Klier and Linn (2016) show that European automobile emissions regulations favour diesel engines, which are primarily manufactured in EU countries, while American regulations favour gasoline engines. If those cases represent trade restrictions, their disguises appear to be working.

The 2011 switch to footprint-based CAFE standards in the US was rationalised (or 'disguised') as improving vehicle safety. Prior to 2011, the uniform standard (the flat 36.2 mpg line in Figure 1) incentivised car companies to sell smaller cars (Kwoka 1983).

5 Articles 1113 and 1703 of the NAFTA, Article XX of the GATT, and Article 20.2 of the TPP.

And a National Academy of Sciences report (2002) found that in collisions, passengers in smaller cars sustain worse injuries.

But that safety justification for the switch has come under scrutiny. In collisions between unequal-sized cars, it's not clear whether more passengers would be saved if the smaller car were larger or the larger car smaller. Furthermore, the National Academy study did not account for the fact that more safety-conscious drivers might select larger cars, making the larger cars appear safer. Most recently, Jacobsen (2013) compared a variety of potential CAFE standards, including the flat standard and the footprint-based one, accounting for all fatalities including pedestrians and bicyclists, and controlling for selection by cautious drivers of larger cars. He finds that the footprint-based standard provides almost no safety benefits, but comes at large cost. The least expensive way to reduce fuel use is to drive smaller cars, and the footprint-based standard eliminates that path to compliance.

In 2017, on the eve of President Trump's inauguration, the US federal agencies finalised their review of the CAFE standards scheduled for model years 2022 through 2025.[6] In preserving the footprint-based standard, the review cites an analysis by Puckett and Kindelberger (2016) that estimates fatality risk as a function of vehicle weight and size. The two are correlated, making inference difficult, and, in general, reducing mass or footprint alone without changing the other, results in no more casualties. But a uniform CAFE standard, as existed before 2011, incentivised reductions in both simultaneously. In general, the safety justification for the switch to footprint-based CAFE standards continues to rely on disputed evidence.

That decision to leave in place the scheduled tightening of the CAFE standards is now being challenged by the Trump Administration. Ironically, while those upcoming strict targets –54.5 mpg by 2023 – will be difficult for all carmakers to meet, their footprint-based formula means they confer an extra advantage on US carmakers.

6 US EPA (2017).

References

Ederington, J. and J. Minier (2003), "Is environmental policy a secondary trade barrier? An empirical analysis", *Canadian Journal of Economics* 36(1): 137-154.

Klier, T. and J. Linn (2016), "Comparing US and EU Approaches to Regulating Automotive Emissions and Fuel Economy", Resources for the Future Policy Brief 160-16.

Kwoka, J. (1983), "The limits of market-oriented regulatory techniques: the case of automotive fuel economy", *Quarterly Journal of Economics* 98(4): 695–704.

Jacobsen, M. (2013), "Fuel Economy and Safety: The Influences of Vehicle Class and Driver Behavior", *American Economic Journal: Applied Economics* 5(3): 1–26.

Levinson, A. (2017), "Environmental Protectionism", Working Paper, [available at: faculty.georgetown.edu/aml6/papers/EnvProtect.pdf].

Miravete, E.J., M.J. Moral, and J. Thurk (2016), "Innovation, Emissions Policy, and Competitive Advantage in the Diffusion of European Diesel Automobiles", mimeo.

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

Puckett, S.M. and J.C. Kindelberger (2016), *Relationships between Fatality Risk, Mass, and Footprint in Model Year 2003-2010 Passenger Cars and LTVs – Preliminary Report,* Washington, DC: National Highway Traffic Safety Administration.

US Environmental Protection Agency (2017), *Final Determination on the Appropriateness of the Model Year 2022-2025 Light-Duty Vehicle Greenhouse Gas Emissions Standards under the Midterm Evaluation*, EPA-420-R-17-001.

About the author

Arik Levinson is a Professor in the Economics Department of Georgetown University, where he teaches microeconomics, public finance and environmental economics. He is a Research Associate at the NBER and a Co-Editor of the Journal of the Association of Environmental and Resource Economists and holds a PhD from Columbia University.