Cars or Trucks? The Impact of Discrete Attribute Basing in Fuel Economy Regulations

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Abstract

Environmental regulations often feature attribute basing: they mandate one dimension of a product that generates externalities but base the standard stringency on a secondary attribute. This study provides empirical evidence of the welfare consequences of attribute basing in the context of U.S. Corporate Average Fuel Economy (CAFE) standards. Throughout the history of CAFE, the policy stringency has been based on a discrete attribute: the classification of light trucks and passenger cars, with light trucks subject to a less stringent target of fuel economy. This differential treatment of cars and trucks has perverse implications as it potentially distorts the fleet composition and increases the tailpipe emissions and accident-related externalities due to a larger market share of light trucks. By estimating a structural model of vehicle demand and supply incorporating CAFE credit trading, this study simulates a counterfactual scenario by removing the standard split and finds that attribute basing results in a 4.9% increase in the sales of light trucks and a corresponding social welfare loss that translates into $2.74 billion in 2014. Attribute basing also leads to welfare redistribution among automakers: the U.S. domestic firms benefit from the attribute basing with a profit increase of 1.8% at the expense of Asian and European automakers with a profit loss of 1.5% and 4.0% respectively.

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