The Economics of Attribute-Based Regulation: Theory and Evidence from Fuel-Economy Standards

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Abstract
This paper analyzes “attribute-based regulations,” in which regulatory compliance depends upon some secondary attribute that is not the intended target of the regulation. Such policies have the potential benefit of harmonizing marginal costs of regulatory compliance across firms, but also create perverse incentives to distort the attribute upon which compliance depends. We develop a theoretical framework that characterizes the welfare implications of attribute-basing, including its potential benefits and costs. We then test our theoretical predictions by exploiting quasi-experimental variation in Japanese fuel-economy regulations, which provide key empirical advantages over data from other countries. We exploit the fact that the fuel-economy targets are downward-sloping step functions of vehicle weight. Our bunching analysis reveals large distortions to vehicle weight that were induced by the policy. We then leverage panel data on vehicle redesigns to empirically investigate the welfare implications of attribute-basing, including both potential benefits and likely costs. This latter analysis concerns a “double notched” policy—vehicles are eligible for an incentive if they are above a step function in the two-dimensional fuel economy by weight space. We develop a new method for analyzing such double notched policies and use it to conduct the welfare analysis of alternative policy designs. Our results show that attribute-basing is an imperfect substitute for a fully efficient policy because it only partially equalizes the marginal compliance costs and creates unnecessary distortions to the attribute.

James M. Sallee is an assistant professor at the Harris School of Public Policy Studies and a Faculty Research Fellow of the National Bureau of Economic Research. His research spans a variety of topics in public economics, including the economics of taxation and environmental economics. His current research is focused on evaluating policy alternatives for increasing the fuel economy of new vehicles in the United States.