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Does Using the Social Cost of Carbon Matter?: An Assessment of U.S. Policy

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Economists have long supported policies that incentivize individuals and organizations to consider the full costs of their actions on society. In the case of climate change, a growing number of economists have argued for introducing market-based mechanisms, such as taxes or cap-and-trade systems, as ways of limiting greenhouse gas emissions.

Absent an economy-wide incentive scheme, governments can account for greenhouse gas emissions by adding a measure of the marginal damages from climate change in benefit-cost analyses. For example, a government might consider a regulation to increase fuel economy standards for automobiles, and include the reduction in carbon dioxide (CO_2) emissions as an additional benefit that has a monetary value.

To perform such an analysis, that government would need to attach a value to a ton of CO_2 reductions. One such value is the "social cost of carbon", or SCC, which measures the monetized damages associated with emitting a specified quantity of carbon dioxide emissions into the atmosphere.

While there has been much debate on the appropriate *value* of the social cost of carbon, there has been much less work on the actual *use* of the social cost of carbon in the design of policy. Existing studies are not set up to test the overall impact of using the SCC on a nation's policy choices. Our paper seeks to fill this gap in the literature.

We provide a detailed analysis of how the use of the social cost of carbon has affected the economic analysis of U.S. regulations. To our knowledge, this paper provides the first systematic test of the extent to which applying the social cost of carbon has affected national policy. Our sample includes the entire set of significant federal regulations that consider the social cost of carbon in the United States, beginning in 2008 – when this policy was first implemented. These regulations typically have an annual economic impact of at least $100 million.

To assess how outcomes were affected, we examine net benefits of all significant federal regulatory policies from 2008 through 2013. We consider 53 regulatory policies, with and without including estimates of the benefits associated with changes in carbon dioxide emissions. Over half of the policies we consider set energy conservation standards for commercial or residential items such as electric motors or dishwashers. Most of the remaining policies set limits on hazardous pollutants from large entities, such as petroleum refineries or electric utilities.

We examine whether inclusion of the benefits from carbon dioxide emissions changes the *sign* of the net benefits for each regulatory policy. Using this measure, we obtain the surprising result that including the benefits from estimated changes in CO_2 emissions does not generally change the sign of quantified net benefits relative to the status quo. Put differently, in almost all cases, estimated net benefits are positive both with and without the social cost of carbon. This finding provides support for the view that the SCC has not had a big effect on actual U.S. policy to date.

We then consider whether the SCC changes the *ranking* of different policy alternatives within a given regulatory policy based on their expected net benefits. In other words, has the SCC led to changes in the details of a regulatory policy? We find some evidence that it does change economic rankings of alternatives in a small number of cases. Whether this led to a change in the actual regulatory decision is less clear because, as we discuss, there are many factors that go into such a decision, not simply the expected net benefits of the policy.

Based on this evidence and analysis, we argue that the SCC does not appear to have had a significant impact on U.S. policy between 2008, when it was first used, and the beginning of 2013. We offer an explanation for the finding related to the underlying political economy of regulation in the U.S.

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