

# More Study Needed of the Overall Impact of Rules on American Society

Designing rules to deliver on environmental and energy goals and maximize their net social benefits requires rigorous analysis. Regulators typically evaluate proposed rules in a manner analogous to how businesses assess investment opportunities. Just as a business would estimate the profitability of a potential investment, a regulator estimates whether the benefits to everybody in society from a regulation exceed the costs borne by everybody in society.

Three agencies with environmental missions — EPA, the Energy Department, and the Transportation Department — are responsible for nearly 90 percent of monetized benefits, and 80 percent of monetized costs, of all federal regulations.

These estimates are based on prospective analyses published when a rule is issued. But how well have these rules worked in practice? Are we realizing the greatest public health benefits for our investment? While regulatory agencies have developed sophisticated methods for assessing the prospective benefits and costs of their regulations — drawing on academic scholarship — they have lagged in the ex-post evaluation of regulatory performance.

To address the above questions, we need to compare the outcomes under regulation — public health improvement, firms' costs, etc. — to what would have occurred in the absence of the rule. We can't simply look at, say, ambient pollutant concentrations before and after a rule, because other factors, such as an economic recession, could occur at the same time as the rule's going into effect. Doing so would risk conflating the impacts of the overall economy with the impacts of the regulation on pollution.

Since economists cannot randomly

assign regulatory status to businesses and populations like a scientist may assign treatment in a double-blind pharmaceutical drug trial, we employ statistical tools to ensure that we are estimating the specific impacts of a regulation. Just as the scientist compares health outcomes between drug recipients (*treated group*) and placebo recipients (*control group*), the economist compares those "treated" by a rule to those who are not affected by the regulation but are otherwise similar.

To illustrate this approach, consider a recent analysis by Olivier Deschênes and colleagues of the nitrogen oxide cap-and-trade program, which regulated NOx emissions at power plants and large manufacturing facilities over the summer ozone season in 19 states starting in 2004. Their analysis compared outcomes — on NOx emissions, ambient ozone concentrations, premature mortality, and medication expenditures — before and after 2004, during and outside the ozone season, and inside and outside the geographic coverage of the cap-and-trade program. Doing so allowed them to identify credible "control" groups that represented the no-regulation counterfactual.

They found that the program reduced covered sources' NOx emissions by 40 percent, contributing to 6 percent lower ozone concentrations, 2,000 fewer deaths annually, and \$1 billion less in annual medication expenditures.

Retrospective evaluations of cap-and-trade programs show that they typically deliver on their environmental goals at lower costs than originally projected. This finding illustrates one of the appealing characteristics of market-based instruments — they provide the incentive for businesses to explore and exploit the lowest-cost pollution-



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reduction strategies. Their ingenuity may identify a low-cost option that the regulator may not have considered in its prospective analysis of the rule.

Let me identify three important lessons for rulemakers. First, they can plan for their retrospective evaluations of regulations during the rule's design phase. Agencies can, when feasible, exploit their discretion in the design, coverage, and phase-in of a regulation to enable a rigorous analysis of the rule's outcomes. Publishing a regulatory evaluation plan in the preamble of proposed and final rules can promote public comment on the envisioned analysis and institutionalize its subsequent implementation.

Second, regulators can develop a data collection plan of the key outcomes for what would be the treated and control groups. This would require agencies to go beyond their norm — collecting data on regulated entities — to include information from those firms and populations that would serve as the control groups. Finally, the data collected and compiled by the regulator can be made available for external evaluation. This can leverage the resources and expertise among academic scholars and stakeholders.

A well-designed approach to regulatory performance evaluation can promote improvements in the design and implementation of rules. Moreover, such evaluations can build public confidence that regulations represent sound investments on behalf of the American people.

**Analysis of a rule's costs and benefits after implementation is key to progress**