Do rebates for carbon prices incentivize a reduction in emissions?

March 7 2023

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Only about one-fifth of global carbon dioxide emissions are currently covered by carbon pricing, a strategy in which fees are imposed on emissions and are often paired with rebates paid back to the emitters. In the new paper "Intensity-based rebating of emissions pricing revenues," published in the *Journal of the Association of Environmental and*

Resource Economists, authors Christoph Böhringer, Carolyn Fischer, and Nicholas Rivers investigate the effectiveness and incentives offered by novel approaches to carbon price rebating.

Despite the view of many economists that carbon pricing is a cost-effective policy response to addressing climate change, "worldwide adoption of carbon pricing has been incomplete," these authors write. Hampering its complete enactment are concerns over such factors as decreased international competitiveness, job loss resulting from large-scale economic shifts associated with higher carbon prices, public opposition to the higher costs of consumer goods that could follow carbon pricing, and lobbying against high carbon pricing by high-emission industries.

Strategically deploying revenues raised by carbon pricing could be a solution to this pervasive hesitancy surrounding the practice. For instance, revenues could be returned to regulated firms with output-based rebates, compensating them for their embodied emissions costs and thus alleviating some cost or competitiveness concerns caused by pricing. But these rebates do not lead to additional emissions reductions in and of themselves, and require carbon price increases to have that effect, the authors note.

Böhringer, Fischer, and Rivers use a theoretical model to analyze how different novel carbon pricing strategies generate different incentives and outcomes and compare them to more established rebating policies. They investigate novel approaches that achieve greater reductions in emissions, and thus might be helpful in increasing the effectiveness of carbon pricing in an overall emissions mitigation policy.

One such approach is abatement-based rebating, which uses rebate revenues to directly subsidize additional emissions reductions. The authors also consider intensity-based emissions rebating, which rewards

emitters that improve emissions performance with a cut to the carbon prices they face (used, for example, with firms in the United Kingdom and British Columbia). Additionally, they consider intensity-based output rebating, which offers larger rebates per unit of output to emitters that make larger improvements in emissions performance (akin to European Union policies for indirect emissions cost compensation).

The authors model these different rebate policy approaches and rank them by how well they incentivize a reduction in emissions and by how little they negatively affect the emitting firm's output. "Notably, with the same carbon price, abatement- and intensity-based rebating policies lead to two to three times more emissions abatement" compared with the other approaches, they write. The authors also find that intensity-based rebating supports output, while abatement-based rebating discourages it.

"These findings suggest that intensity-based rebating of carbon pricing revenues could help resolve the trilemma facing effective and acceptable carbon pricing design by simultaneously keeping carbon prices low, achieving deeper greenhouse gas reductions, and protecting firms from price increase and output loss," the authors write. "Our ranking suggests that by both protecting output and increasing emission reductions achieved at a given carbon-price, intensity-based rebating may be useful in addressing key concerns that prevent wider adoption of effective carbon pricing."

More information: Christoph Böhringer et al, Intensity-based rebating of emissions pricing revenues, *Journal of the Association of Environmental and Resource Economists* (2023). DOI: 10.1086/723645

Provided by University of Chicago