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Global carbon price asymmetry

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This paper studies a social planner who chooses countries' carbon prices so as to maximize global welfare. Product markets are characterized by firm heterogeneity, market power, and international trade. Because of the market-power distortion, the planner's optimal policy is second-best. The main insight is that optimal carbon prices may be highly asymmetric: zero in some countries and above the social cost of carbon in countries with relatively dirty production. This result obtains even though a uniform global carbon price is always successful at reducing countries' emissions. Competition policy that mitigates market power may enable stronger and more balanced climate action.

Carbon pricing is increasingly being used as a key policy instrument to combat climate change. Yet carbon prices around the world remain low and uneven: around $30 per ton of CO2 in Europe's flagship cap-and-trade system—and even higher for some national carbon taxes—but much lower in most other jurisdictions. This picture stands in marked contrast to the Pigouvian ideal of a uniform global carbon price set at the social cost of carbon (SCC).

So far, carbon pricing has focused on power generation and emissions-intensive industrial sectors like aluminium, cement and steel. Three characteristics of these regulated industries are striking. First, firms within each industry often have widely varying carbon intensities of production. This enhances the potential for market-based regulation to achieve significant gains in abatement-cost efficiency. Second, emissions-intensive industries are often highly concentrated with long-standing concerns about the exercise of market power. This makes relevant the theory of the second best. Third, international trade is important as the scope of the product market in which regulated firms compete is often wider than that of the carbon price they face. This has led to concerns about the potential for leakage of emissions to less regulated jurisdictions.

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This paper studies the optimal design of carbon prices in a model in which these three characteristics are crucial. The model considers a social planner who chooses countries' carbon prices so as to maximize global welfare. Because of a market-power distortion in the product market, the planner's optimal policy is second-best. The central trade-off is that a higher carbon price reduces a country's domestic emissions but also increases deadweight losses in the product market (due to pass-through of carbon costs to consumers) and leads to a degree of carbon leakage to the other country. Thereby, the country with relatively clean firms is more vulnerable to carbon leakage as a policy-induced loss in production to the dirtier country translates into a larger increase in emissions. In the special case without market power and without carbon leakage, the planner sets a uniform global carbon price at the SCC, restoring the first-best outcome.

The main insight is that second-best carbon prices can be highly asymmetric across countries. Market power, on its own, pushes countries' optimal carbon prices downwards as the planner seeks to cushion the increase in consumer prices. The presence of international trade introduces a further effect: if carbon leakage for the country with relatively clean firms is sufficiently pronounced, its optimal carbon price is zero. This, in turn, limits deadweight losses in the product market and enables the planner to choose a higher carbon price for the dirtier country——which creates additional climate benefits as it reshuffles production to cleaner firms. As long as market power is not too pronounced, the dirtier country's optimal carbon price may lie above the SCC. This finding obtains even though a uniform global carbon price is always successful in reducing countries' emissions.

The result should not be overplayed given the model's very simple welfare function. The more general point is that, while carbon prices around the world today are almost certainly far too low, failing to implement a uniform global carbon price does not necessarily imply the wrong response to climate change. Moreover, competition policy to mitigate market power may also enable stronger and more balanced climate action.