The importance of international coordination of environmental policies

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The US Treasury Secretary Janet Yellen called on 6 July 2021 for tighter international coordination on carbon environmental policies. So why can' individual countries implement their own environmental policies in an effective fashion so that global warming will be slowed down?

The reason is that environmental policies are a form of tax on most firms. These policies require firms to install expensive equipment and modify existing production processes. Otherwise, they suffer the consequences of fines and legal actions. However, firms, especially multinational firms, can eschew these costly policies by engaging in polluting activities in jurisdictions with lax environmental policies. Such “carbon leakage” is why without international coordination, these policies will not achieve their goals from a global perspective.

How do environmental regulations affect polluting activities?

Scholars have long argued that environmental laws and pollution by companies are inextricably linked. When global corporations face strict regulations, they have two options: innovate or move damaging activities abroad. Some countries, on the other hand, use lax environmental laws to attract industrial facilities and employment. Thus, multinational firms that face stringent regulation at home tend to allocate their polluting activities to existing operations in countries with weak environmental regulations. Economists call this the pollution haven hypothesis (PHH).

However, testing this hypothesis is challenging. Previous research relied on country-level or industry-level statistics without observing actual pollution at the firm level. For example, several studies infer pollution from other variables, such as a company’s location or manufacturing decisions. Alternatively, other studies take a relatively broad scope, connecting aggregated economic activity to environmental law.

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Our study is the first to evaluate the PHH using micro-level data of actual CO_2 emissions by multinational firms, which are often used by institutional investors to allocate their investments. For a large sample of multinational firms, we know the CO_2 tonnage emitted in each country in each year between 2008 and 2015. After matching the data with the measure for the strictness of environmental legislation obtained from the World Economic Forum, we study where pollution takes place around the globe.

Environmental regulation varies greatly around the globe as in Figure 1. The positive news is a general improvement in environmental regulation over time (from red to green). However, it remains weak in several large regions, such as Africa, South America, and Asia. In addition, as documented in Figure 2, we also observe the trend that firms continuously increased the fraction of pollution they export to foreign countries over time while moderately reducing pollution at home. As environmental regulations have, on average, tightened globally, it is important to examine whether firms’ polluting activities have evolved in response to the discrepancy in environmental policies around the world.

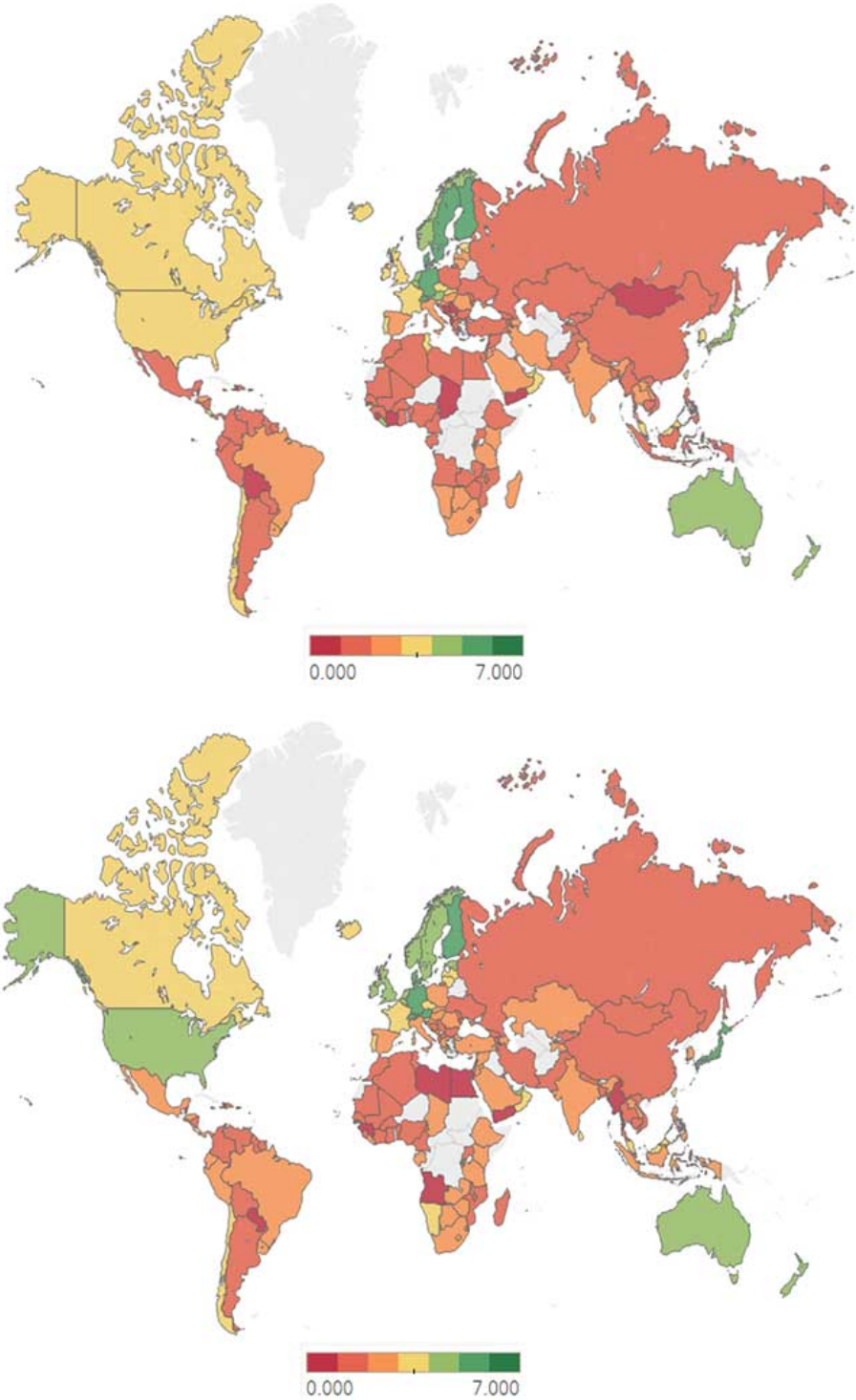

Figure 1: Environmental regulation on a nationwide basis as of 2008 (top) and 2015 (bottom). The heat maps show the environmental regulation score for the 150 countries as of 2008 and 2015. The index combines the World Economic Forum's assessment of a country's stringency and enforcement of environmental regulation. It ranges from 0 to 7, with lower values (red) indicating laxer regulation and higher values (green) indicating stricter regulation.

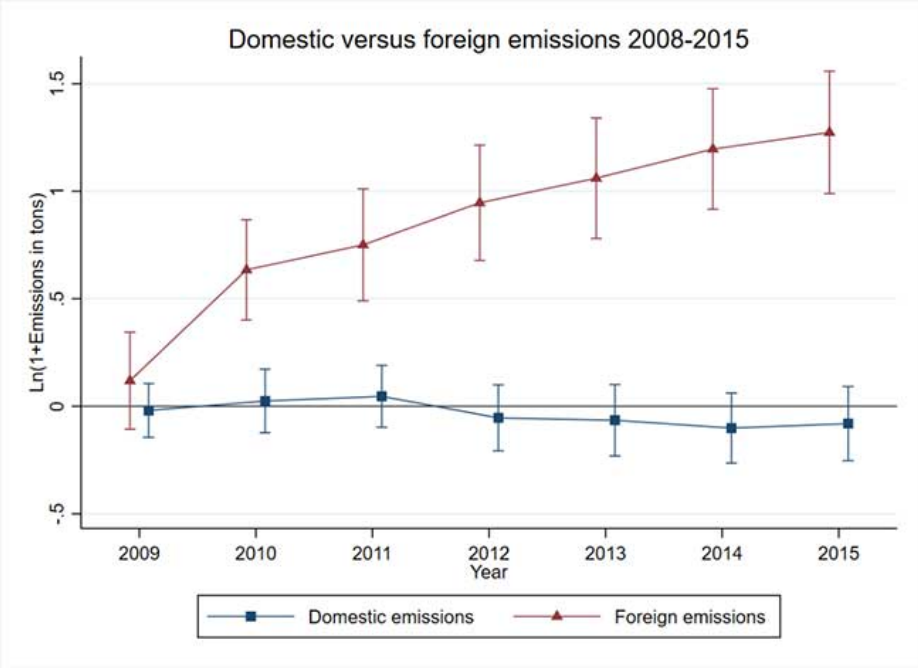

Figure 2: Domestic versus Foreign Emissions 2008-2015. This figure shows the annual changes in domestic and foreign CO2 emissions by firms in our sample over the period of 2008-2015. We plot the point estimates and 95% confidence intervals of the year indicators from the OLS regressions, where the dependent variable is ln(1+Home emissions) and ln(1+Foreign emissions) with firm fixed effects.

Where do large multinational firms pollute?

Our study shows that large multinational firms with stricter environmental policies in their home countries (where the firm is headquartered) are generally associated with lower pollution levels. However, the positive effect of tighter environmental policies is partly offset by firms' responses of polluting elsewhere—especially in countries with lax environmental policies.

"Our analysis shows… firms are forced out from their home countries' tight environmental policies rather than attracted by countries with lax policies."

Our rich dataset also allows us to study the existence of "pull" versus "push" effects. Specifically, we are interested in understanding whether firms are attracted ("pulled") to emit CO_2 in countries with low environmental policies or are "pushed" to do so by the strict environmental policies at home. Our analysis shows that multinationals exporting pollution are mainly driven by the push effect. In other words, firms are forced out from their home countries' tight environmental policies rather than attracted by countries with lax policies.

Some industries export more pollution than others. Firms involved in the production of coals and refined petroleum are the worst pollutants and those with the highest adjustment costs to clean technology. Our study shows that when confronted with domestic restrictions, a typical firm in our sample lowers its domestic emissions. However, pollution-intensive businesses do not decrease emissions even in their nation and export pollution twice as much as firms in other industries. As a result, targeting high-polluting sectors may be more effective in curbing global emissions.

Overall, our results strongly support Secretary Yellen's call for international cooperation with respect to carbon environmental policies. Without such collaboration, leakage of polluting activities to countries with lax policies offsets much of the benefits due to the strict policies implemented by other countries.

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