

trade and environmental regulations

The relationship between trade and environmental regulations has received much attention from trade negotiators, businesses, and environmental activists as well as academics. The intuition is straightforward: as a country increases environmental regulations (or the stringency with which they're enforced) on an industry, the industry's costs increase, making the industry less competitive internationally and increasing imports and decreasing exports in the industry. Ultimately, this could lead to the concentration of polluting industries in "pollution havens," or countries with more lax environmental standards.

This conventional wisdom that environmental regulations affect trade flows – known in the academic literature as the "pollution haven effect" – failed to receive much support in early papers on the subject, such as Grossman and Krueger (1993). A key result of this literature was that measures of environmental control costs often had no effect (or sometimes even positive effects) on a country's net exports. Evidence for the pollution haven effect is typically found by analyzing the correlation between environmental control costs and net trade flows. The basic starting hypothesis is that, if stringent environmental regulations are a source of competitive disadvantage, then a country's most regulated industries should have the highest levels of import penetration. Thus, early econometric studies typically involved cross-sectional regressions of industry trade flows on a set of industry characteristics, including environmental costs, and discovered little evidence of a pollution haven effect. This was surprising, but was usually rationalized as either due to the fact that environmental costs are a very small fraction of most firms' total costs (so even if a pollution haven effect existed, it was very close to zero), or to the "Porter effect," the idea that regulation leads to innovation and lower costs.

However, this conclusion has been overturned by a new wave of empirical research that modifies the analysis to allow for unobserved industry effects and the endogeneity of environmental regulations. A potential problem with the traditional approach is unobserved heterogeneity: the potential for unobserved characteristics of industries to be correlated with both trade flows and the degree of regulatory stringency. A second problem is simultaneity, or the potential for trade flows and pollution regulations to be determined simultaneously. For example, as argued in Ederington and Minier (2003), if legislators tend to relax enforcement of

environmental policy when an industry faces increased imports (which may be likely when international trade agreements prevent them from responding by adjusting trade policy) – effectively using environmental policy as a secondary trade barrier – then failing to account for this endogeneity of environmental regulations results in biased estimates of the effect of environmental policy on trade flows. Levinson and Taylor (2008) express these points clearly and provide a theoretical model to show likely sources of bias in conventional measures of pollution-haven effects. Clearly, unobserved heterogeneity in the pollution haven regression can be solved by both using more disaggregated data and using panel data, which allows the inclusion of industry fixed effects to capture unobserved industry characteristics; the endogeneity of environmental regulation can be addressed by using instrumental variables. Both Ederington and Minier (2003) and Levinson and Taylor (2008) use these approaches and find statistically and economically significant evidence of pollution haven effects.

Evidence for significant pollution haven effects creates potential concerns for the design and structure of trade agreements. As currently structured, the GATT is an *instrument-based* agreement with respect to trade policy in that WTO members negotiate over tariff concessions, and then are required by the agreement to respect the binding tariff ceilings that are a result of these negotiations. In contrast, the GATT is a *rules-based* agreement with respect to environmental policy and leaves discretion to WTO members in the setting of their environmental standards with the exception that the resulting standards must adhere to certain GATT rules (principally the national treatment provision in Article III of GATT). However, to the extent that countries can relax environmental regulations on import-competing sectors as a means of reducing trade flows, they can undermine commitments previously made with respect to trade policy. These issues have led to a large and growing body of work on the use of environmental regulations as a secondary trade barrier, and the design and structure of trade agreements when domestic policies can be used a secondary means of protection.

Of course, whether environmental regulations are used as a secondary trade barrier also raises the question of the extent to which environmental regulations are affected by trade concerns. There is definitely anecdotal evidence for such a connection: the earliest national environmental legislation (including, for example, the U.S. Federal Water Pollution Control Act of 1970) required studies of the effects of environmental regulations on U.S. competitiveness. In addition,

several presidents have established task forces explicitly to relax domestic regulations (including environmental regulations) that adversely affected U.S. trade competitiveness. However, explicit empirical evidence on this connection is limited (although Ederington and Minier (2003) do find that an increase in imports is correlated with a subsequent relaxation in pollution abatement costs).

It should be noted that this literature generally focuses on finding evidence for or against a “pollution haven effect,” or evidence that a tightening of environmental regulations deters exports (or stimulates imports). This is related to, but distinct from, the “pollution haven hypothesis” that as trade barriers are reduced, pollution-intensive industries shift production into low-income countries with lax environmental regulations. As discussed in several papers, including Antweiler, Copeland, and Taylor (2001), evidence for a pollution haven effect does not necessarily imply the validity of the pollution haven hypothesis; while these effects are important, there are many other determinants (e.g., factor abundance) that determine trade flows. Antweiler et al. (2001) was one of the first papers to look for evidence of the pollution haven hypothesis, basically by linking trade liberalization to changes in pollution concentrations across countries. Ederington, Levinson and Minier (2004) subsequently attempted a more direct approach using data on trade flows: has trade liberalization induced the U.S. to produce cleaner goods while importing dirtier goods from abroad? Neither paper finds evidence for the pollution haven hypothesis. Ederington et al. (2004) show that over the last several decades, the composition of U.S. *imports* has become cleaner than U.S. production over that period.

Finally, the papers discussed previously all examine the overall (cross-country, or cross-industry) relationship between trade flows and environmental regulations. Ederington, Levinson, and Minier (2005) take a different approach, discussing several reasons why the effect of environmental policy on trade flows might be very important for some types of trade and some industries, although this effect could be masked in a full sample of industries. First, they show that differences in environmental standards are likely to matter most for trade between developed and developing economies (where standards are further apart), while the majority of trade occurs between developed countries. Second, they show that for most industries, environmental costs are a small part of total costs, so even a significant increase in environmental costs is unlikely to have much effect on production in most industries. Finally, they note that industries vary in the

extent to which they are “footloose” (i.e., able to easily move production overseas to take advantage of lower environmental standards). Industries are considered to be less footloose if they have high transport costs (such as cement), high firm fixed costs, or seem to benefit from agglomeration economies (being geographically concentrated). Ederington et al. (2005) show that the effect of environmental regulation on trade flows is large in magnitude and statistically significant for trade between developed and developing countries, for industries in which environmental costs are a large part of total costs, and for industries that are not “footloose.”

To summarize, the relationship between trade and environmental regulations has been much studied in the last two decades: it’s a policy-relevant question that offered an interesting economic “puzzle.” If environmental regulations make domestic firms less competitive internationally, why don’t we see this effect in trade flows? Recent research that controls for the effects of policy endogeneity, industry heterogeneity, and the type of trade and industry suggests that environmental regulations do affect trade flows. There is little evidence, however, that production of dirty goods has shifted into countries with less stringent standards.

References

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