

# **Economic spillovers from international environmental cooperation**

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## *Limits to multilateral environmental agreements*

Successful international environmental agreements (IEAs) must meet two important criteria. First, countries must choose to enter into them voluntarily. Second, the agreements must be self-enforcing, in the sense that members of an IEA must have the capacity and the willingness to respond to deviations by an individual or group of countries from the rules of the treaty [see, for example Carraro and Siniscalco (1998), and Finus, et al (2005)].

These criteria limit the potential for IEAs to improve environmental conditions. If the required amount of environmental improvement (such as a reduction of emissions) deviates too far from that of the least motivated country, either that country will refuse to enter into the IEA, or the rules of the IEA will prove impossible to enforce. As such, countries that are considering an IEA are left with two undesirable options. First, they can limit the membership of the IEA to a small number of like-minded nations. Alternatively, they can ease the environmental improvement sufficiently to match the desires of the least motivated member. Neither choice is particularly attractive. IEAs comprised of a small number of like-minded nations are unlikely to include the most egregious polluters, and are thus unlikely to improve much on outcomes that the members could have attained unilaterally. But if the terms of the IEA are watered down to please the desires of the least motivated country in a large heterogeneous group, little overall improvement in environmental quality is likely to be achieved.

## *Additional spillover benefits*

This pessimistic outlook stems from the view that national governments make IEA membership and compliance decisions solely based on the merits of the agreements themselves. In reality, countries cooperate with each other on a number of additional dimensions; economic, strategic, and political. This raises the possibility of “reputation spillovers” across these arenas of interactions, whereby cooperative behavior in one dimension of interaction may induce cooperative behavior by other countries in other dimensions. Cole and Kehoe (1998) demonstrate that reputations for cooperative behavior in non-economic activities can enhance a country’s perceived creditworthiness, yielding positive economic benefits as well.

In a recent paper (Rose and Spiegel, 2008) we apply the idea of reputation spillovers to the relationship between environmental interaction and international exchange. In a model of international asset exchange, we show that countries’ behavior in environmental activities support their economic interactions. Countries that participate more in IEAs also experience better economic outcomes, in both theory and practice.

There are two theoretical channels through which IEAs can facilitate international economic exchange. Environmental agreements require up-front investment whose benefits only accrue over time. Given this characteristic, the willingness of a nation to enter into an IEA provides a signal to foreign investors about the “patience,” or lack thereof, of that country’s government. A government that is more willing to join an IEA also tends to discount the future at a lower rate. Patience is also a desirable attribute for sovereign borrowers, as the benefits of defaulting on one’s debt obligations (an immediate cessation of debt payments) are commonly experienced immediately, while the costs of default (limited access to capital markets for some period of time) are only suffered over time. Sending a signal of patience through membership in an IEA therefore enhances the perceived creditworthiness of a nation and thus its borrowing capacity.

There is also a second channel through which IEA participation encourages economic interactions. In particular, an IEA provides an additional arena for punishing a borrowing country for defaulting on its debt obligations. Countries are less likely to act badly in the economic sphere if they can be pushed through environmental actions by foreigners.

After developing these ideas theoretically, we use data on international asset cross-holdings in a “gravity” model of financial flows to test these hypotheses. We find that both the overall and the bilateral number of IEA commitments have a positive impact on cross-holdings of financial assets. The estimated effect is small, but statistically significant. A one standard deviation in the number of environmental treaties unilaterally joined is predicted to increase asset- cross-holdings by 0.65%, while moving from being a pair of countries in the 25<sup>th</sup> percentile in jointly-held treaties (with 7) to being in the 75<sup>th</sup> percentile (with 54) increases predicted cross-holdings of assets by 1.5%. These results are largely robust to a variety of sensitivity analysis, as well as conditioning for the potential endogeneity of IEA membership.

### *Conclusion*

Our research shows that there are economic costs of “going it alone,” i.e. not joining multilateral IEAs, over and above the standard considerations concerning the costs and benefits of the environmental agreement itself. As such, the results have consequences for policy: For example, the debate over American participation in the Kyoto Protocol was framed solely in terms of the costs and benefits to the United States of participation in that treaty. However, the United States interacts with other nations in a variety of other domains, such as security arrangements and international organizations. Spillover benefits analogous to those identified by Rose and Spiegel may also exist in these other channels, potentially raising the overall gains from from IEA membership.

### *References*

Carraro, Carlo, and Domenico Siniscalco, (1998), “International Environmental Agreements: Incentives and Political Economy,” *European Economic Review*, 42, 561-572.

Cole, Harold L. and Patrick J. Kehoe, (1998), "Models of Sovereign Debt: Partial vs. General Reputations," *International Economic Review*, 39(1), 55-70.

Finus, Michael, Juan-Carlos Altamirano-Cabrera, and Ekko C. Van Ierland, (2005), "The Effect of Membership Rules and Voting Schemes on the Success of International Climate Agreements," *Public Choice*, 125, 95-127.

Rose, Andrew K. and Mark M. Spiegel, (2008), "Non-Economic Engagement and International Exchange: The Case of Environmental Treaties," NBER Working Paper no. 13988, April.