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Shadow prices, environmental stringency, and international competitiveness

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Abstract

Empirical tests of the relationship between international competitiveness and the severity of environmental regulations are hampered by the lack of pollution abatement cost data for non-U.S. countries. The theory of the firm suggests that environmental stringency can be measured by the difference between a polluting input's shadow price and its market price. We make a first attempt at quantifying such a measure for two industries located in nine European OECD countries. Overall, we provide (i) a new approach to measure cross-country regulatory differences in that we use a theoretically attractive measure of industry-specific private compliance cost, and (ii) empirical estimates that are an attractive tool for researchers and policymakers who are interested in examining how economic activity is influenced by compliance costs.

JEL classification: H73; Q28; R38

Keywords: Cross-country environmental regulation; Interjurisdictional competition

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> "Poorly buried drums of hazardous waste" (in Mexico) are evidence of "different levels of environmental protection around the world" that give a "competitive advantage" to nations that have "inadequate environmental protection".
>
> U.S. Senator Max Baucus
>
> (at the hearings of the "International Pollution Deterrence Act of 1991").

1. Introduction

The relationship between environmental protection and international competitiveness has been the subject of heated debate among policymakers, environmentalists, and industrial representatives. While economic theory suggests that full internalization of the negative externalities associated with economic activity (for example via environmental taxes or tradable permits) shifts the marginal cost function upward, there is a school of thought that argues that more stringent environmental policy may *enhance* international competitiveness (e.g., Porter and van der Linde, 1995). A typical line of argument is that apart from the productivity impacts of a cleaner environment (for example, increased quality of various inputs, such as the health of the workforce or the purity of water) and the stimulus for the production of compliance capital goods, the shock of having to meet stricter environmental regulations may induce firms to actively search for and wring out possible inefficiencies in their production processes.

A key shortcoming in the extant literature that estimates the relationship between environmental stringency and international competitiveness is the lack of consensus about the appropriate method of measuring environmental stringency. While Jaffe et al. (1995) list several indicators of competitiveness, such as net exports, share in world production, and the amount of foreign direct investment (FDI) a country receives,[1] to date no convincing indicators measuring the stringency of environmental policy have been developed that allow for appropriate international comparisons. The only private cost compliance measures that we are aware of are the Pollution Abatement Cost Expenditures (PACE) data that derive compliance cost estimates by differencing current capital and operating expenditures from what these expenditures would have been absent environmental regulations. Unfortunately, time series of these data are available for the U.S. only (from the *Annual Survey of Manufactures*), and therefore international comparisons are frustrated. This deficiency represents a catalyst for why anecdotal evidence, such as the statement of Senator Baucus above, carries such an inordinate amount of weight in policymaking. We are of the belief that without a theoretically consistent measure of spatial environmental stringency, any debate concerning the relationship between environmental policies and international competitiveness is premature.

[1]These measures are not perfect, as general equilibrium adjustments will, in practice, mask the full effect of the impact of environmental stringency.