

The Myth of the Downward Spiral in Environmental Policy Regulation

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Introduction

The process of globalization has raised concern among social scientists that the tax revenue of states and regulatory protection standards are driven down by a process of competition among states. Empirical evidence thus far shows that capital tax competition works, in fact, as the theory predicts: it drives tax rates down (e.g., Ganghof and Genschel 2008). The empirical picture for regulatory competition, however, is mixed.

In the environmental field, various approaches to analyze regulatory competition have not led to a clear result, but to a complex empirical picture and to modifications of the theory. There are some indications that regulatory competition may have an effect on the competitiveness of industries (Xing and Kolstad 2002). Studies analyzing the change in environmental quality, however, find no 'races to the bottom,' but 'races to the top' instead (Drezner 2001; Hoberg 2001; Konisky 2007; Potoski 2001). But none of these studies measure regulatory races directly: They use economic indicators, which either show a relationship between environmental costs and competitiveness or decisions regarding location, or measure environmental quality development, but not policy change directly. (For a research overview, see Holzinger and Sommerer 2011.)

Why do we, in contrast to the theory, not find a general race to the bottom? A number of hypotheses have been put forth to explain the mixed evidence in the environmental field. Such hypotheses relate to environmental regulation costs, the political demand for green politics, and context conditions such as the trade regime and the type of standard. The research presented here explores a further hypothesis: International cooperation and supranational harmonization, particularly in the European Union (EU), may be responsible for the lack of regulatory downward spirals. Furthermore, there are many motives

for the concerned actors to revert to international institutions and seek harmonized environmental regulation, which then impedes a downward spiral of regulatory competition.

The article develops and provides empirical support for this hypothesis. Section 1 introduces the theory of regulatory competition in the environmental field and derives the hypothesis. Section 2 presents the results of our empirical analysis, which is based on the quantitative analysis of environmental protection standards.

1 The theory of regulatory competition in the environmental field

The concept of regulatory competition is based on economic theories of systems and regulatory competition (Oates and Schwab 1988). The basic theory suggests that the presence of competition leads to a 'race to the bottom' of environmental standards. This is based on the assumption that nation-states are pressured by the increasing integration of European and global markets, the abolition of national trade barriers and the international mobility of goods, workers and capital to adapt domestic market regulations in order to avoid regulatory burdens restricting the competitiveness of domestic industries (Keohane and Nye 2000; Holzinger and Knill 2004, 27f).

The basic theory rests on a number of assumptions but empirical studies have shown that these conditions are not always fulfilled in practice. These observations have led to some modifications of the theory:

- Most importantly, the basic theory assumes that the costs of adhering to stricter environmental standards are great enough to cause severe competitive disadvantages for firms, leading them to relocate business. Vogel (2000, 365f), however, argues that environmental costs are not significant enough to cause regulatory competition. He stresses that the costs of compliance with stricter regulatory standards have not been sufficiently high to force relatively affluent nations to choose

between competitiveness and environmental protection.

- Second, the basic model is based on the idea of competition among firms within a free trade regime. In practice, however, it is often possible to wall off a country against foreign products for environmental reasons. Given this, the competitive disadvantages of an industry in a high-standard country may not be very serious. Holzinger (2003, 206–07) shows that, given the variation in trade regimes, no general "race to the bottom" can be predicted.

- Third, the theory does not differentiate between product and process standards. Whereas a widely shared expectation is that regulation will occur at the lowest common denominator in the case of process standards, harmonization advantages might inhibit a downward spiral for product standards and even trigger a 'race to the top.' Industries in both low-regulating and high-regulating countries have a common interest in harmonizing product standards to avoid market segmentation, making harmonization at a high level of protection possible (Holzinger 2003; Scharpf 1997; Vogel 1995).

- Fourth, it is assumed that governments react exclusively to international capital preferences, ignoring the preferences of voters or interest groups. Jänicke and Jakob (2004) have pointed out that political demand for strict environmental policies may outweigh economic pressures, while Vogel (2000, 267) argues that environmental standards tend to be stricter in nations with influential green pressure groups.

- Fifth, Chua (1999, 423) holds that the role of technical innovation and the international diffusion of environmental technologies have been underestimated. Moreover, firms may also be seeking clean environmental resources as factor inputs.

The influence of international environmental policy on national regulation has been neglected thus far. There are many international

regimes regulating environmental problems, most notably the EU.

Many incentives also exist for businesses and other political actors to cooperate at the international level and to harmonize environmental standards. Sometimes there are even incentives for cooperation at a high level of protection. In the case of transboundary environmental problems, there are incentives for international cooperation due to externalities between states, which can only be efficiently solved together. In addition, the harmonization advantages for product standards imply not only an economic incentive to voluntarily adopt similar standards, but also an incentive for more obligatory international cooperation.

In the case of product standards, another incentive consists of the elimination of trade barriers through harmonization. This is especially true for the European internal market. Also, distortion of competition due to different levels of regulation presents an economic incentive in the case of process standards. Such distortion can be avoided by harmonization – which has the same effect as a cartel and may be in the very interest of industry. Lastly, ‘innovative races’ may occur (Jänicke 2005), in which countries that are forerunners with respect to environmental legislation may want to make their rules obligatory at the international level. Those countries often have highly developed environmental industries that are able to offer innovative technology first, and international harmonization at the level of the best available technology gives those industries competitive advantages. In addition, a pioneer country avoids adaptation costs if its model of regulation becomes obligatory internationally (Holzinger and Knill 2005).

Based on the basic theory of regulatory competition, its modifications and the above reasoning on international cooperation, we arrive at the following hypotheses:

H1: The higher the economic integration of a country and the higher the costs of environmental

regulation, the more downward movements of national environmental regulation we should observe.

H2: We expect downward spirals only if a strict free-trade regime applies and if process standards are involved.

H3: We expect upward spirals if trade barriers for environmental reasons are permitted and if product standards are involved.

H4: We expect upward spirals if there is strong demand for environmental policies (e.g., exerted by green parties).

H5: The more developed that environmental technology and industry in a country are, the more upward movements we should observe.

H6: The more foreign direct investment occurs in green countries, the more upward movements we should observe.

H7: The more international harmonization in environmental policy takes place, the more upward movements we should observe.

2 Empirical analysis

We tested the hypotheses using environmental output data for 24 countries from 1970 to 2005. The data set includes yearly data on the development of 17 environmental measures and has been compiled in two subsequent research projects.¹ It represents limit values for emissions in the fields of air quality, water pollution and noise regulation, as well as recycling quotas. Six measures refer to product standards, eight regulate the production process, and three are not directly trade-relevant. In the country sample, 14 member states of the former EU-15 are represented, complemented by new member states from Central and Eastern Europe; by Norway, Switzerland and three non-European countries; and by Japan, Mexico and the United States.

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Continuous improvement in the level of protection

Our empirical investigation of regulatory competition is divided into two parts. First, we address the question of whether we in fact find ‘races to the bottom’ or, rather, evidence for a tightening of environmental standards. The analysis of upward or downward movements in the level of regulation provides a clear answer to this question. Of the 918 changes documented in

the data set, 865 represent upward moves, with only 53 – or 6 percent – representing downward moves. There is no downward spiraling in national environmental policies, but a general trend toward stricter regulation.

Our analysis also shows that most downward moves happened after 1990, although they still account only for about 10 percent of all changes in regulations. In terms of individual

TABLE 1: FREQUENCY OF CHANGES IN REGULATIONS, 17 LIMIT VALUES

	ALL CHANGES	UPWARD CHANGES		DOWNWARD CHANGES	
All standards	918	865	94%	53	6%
1970–1980	200	198	99%	2	1%
1980–1990	238	238	100%	0	0%
1990–2000	321	284	88%	37	12%
2000–2005	159	145	91%	14	9%
<i>Product standards</i>					
Sulphur content gas oil (vol%)	71	71	100%	0	0%
Lead content in petrol (g/l)	82	82	100%	0	0%
Passenger car emissions CO (g/km)	122	121	99%	1	1%
Passenger car emissions HC (g/km)	117	116	99%	1	1%
Passenger car emissions NOx (g/km)	104	88	85%	16	15%
Noise emissions from lorries (dB)	73	72	99%	1	1%
<i>Process standards</i>					
Large combustion plants SO ₂ (mg/m ³)	42	42	100%	0	0%
Large combustion plants NO _x (mg/m ³)	39	38	97%	1	3%
Large combustion plants dust (mg/m ³)	39	39	100%	0	0%
Lead in industrial discharges (mg/l)	29	25	86%	4	14%
Copper in industrial discharges (mg/l)	27	23	85%	4	15%
Zinc in industrial discharges (mg/l)	27	21	78%	6	22%
Chromium in industrial discharges (mg/l)	27	23	85%	4	15%
BOD in industrial discharges (mg/l)	23	18	78%	5	22%
<i>Trade-irrelevant standards</i>					
Motorway noise emissions (dB)	19	19	100%	0	0%
Glass recycling target (percent)	38	34	89%	4	11%
Paper recycling target (percent)	39	33	85%	6	15%

policies, most downward moves occurred for NO_x emission of passenger cars and for zinc and Biochemical Oxygen Demand standards regarding industrial discharges into water. In the case of NO_x emissions, all downward moves are of a pure technical nature and cannot be interpreted as a 'race to the bottom.' The EU had changed its measurement procedure for car emissions – the so-called EuroTest – and this led to a nominal increase of the NO_x value. For zinc emissions in industrial discharges, the downward development can, to a large degree, be explained by Mexico and changes in Eastern European countries, which, for the first time, introduced 'realistic' standards during the 1990s. Most Eastern European countries had – for reputational concerns – extremely strict legal standards for some environmental media, but did not implement them. The story is similar for BOD and other industrial emissions.

For Japan and the United States, no downward changes are reported, whereas most European countries experience at least one instance (the NO_x value mentioned above). Higher numbers of downward changes are only found in Mexico and Eastern European countries for the reasons given above. The only Western country with more than two downward changes is Germany, where some

ambitious recycling quotas have been relaxed in the late 1990s.

Explanation of regulatory changes

Since the descriptive analysis has shown that the share of downward movements is low (6 percent) and can be linked to singular events and decisions, the first two hypotheses need not be tested any further. Therefore, the focus of the second part of the empirical analysis lies on the explanation of upward change: Why do we find such a strong tendency toward a 'race to the top'?

We used a multivariate regression analysis to assess the empirical relevance of potential driving factors of upward change (hypotheses 3–7). Some theoretical expectations differentiated between product and process standards, so we therefore analyzed both groups separately and compared those results with the results for the entire sample. To control for the effects of major transformations in the Central and Eastern European countries in our sample, we compared the estimates for the whole observation period with results for the periods before and after 1990.

According to the basic version of the theory, a country is likely to be prone to economic and thus regulatory competition if its national economy is

TABLE 2: REGRESSION RESULTS

	<i>ALL STANDARDS</i>		
	WHOLE PERIOD	BEFORE 1990	AFTER 1990
Trade openness (H3)	-		--
Institutional barriers to trade (H3)	++		
Success of green parties (H4)			
Presence of Greenpeace (H4)	++		
Existence of environmental ministry (H4)			
Economic development (H4)	--	++	--
Number of green patents (H5)			--
FDI net inflow (H6)			
EU membership (H7)	+	+	++

dependent on foreign trade. However, the variable of trade openness, i.e., the relation between the sum of the export and import of a country and the size of its economy, does not seem to play a role in upward changes of environmental standards (cf. Holzinger et al. 2008). No significant coefficients can be observed, not even for product standards.

The conjecture that high vulnerability to trade might lead to an upward race gets some weak support from a second variable that represents the influence of regulatory barriers to trade: economic openness operationalized by an index of trade barriers, taxes on trade and capital market controls. A significant positive result for this variable is only obtained for the general model, and not – as expected in hypothesis 3 – for product standards.

Hypothesis 4 refers to domestic demand for strict environmental policy. Whereas the success of green parties does not significantly affect policy change, the presence of environmental groups – we use the existence of a national Greenpeace branch as a proxy – has a positive influence on upward change. A country's administrative capacity measured through the presence of an independent environmental ministry does not explain the strengthening of regulatory standards.

The level of economic development, however, plays a significant role. A negative relationship is observed for per capita income in the basic model, but an interesting difference is revealed during the observation period. Before 1990, high per-capita income increases the likelihood of upward movements. Afterwards, however, the sign turns negative, pointing at a process of catching up, within which less-developed countries also strengthen their environmental policies.

Hypothesis 5 claims a positive influence of a strong environmental technology sector on upward changes. This cannot be confirmed in the regression analysis, as a variable measuring the number of patents on green technology only reports a significant (but negative) relationship in the second half of the observation period.

In contrast to this, our data provide some empirical support to the last two hypotheses. From 1970 to 1990, economically attractive countries, in addition to richer countries, have been more likely to strengthen the regulatory level of their environmental policies. Governments can afford strict environmental standards more when there are greater foreign direct investment inflows. Furthermore, in line with hypothesis 6, the strict standards might attract firms seeking clean environments as a production factor.

The most powerful predictor of upward movements, however, is EU membership. This variable represents the impact of European harmonization, which, as expected, plays an important role. Our models reveal a positive and highly significant effect from EU membership. This is true for the overall model of all 17 standards, as well as for product standards between 1990 and 2010.

3 Conclusion

A review of the literature on regulatory competition in the environmental field shows that the basic prediction of a downward spiraling of regulatory levels has since changed into more differentiated hypotheses. Previous empirical tests did not use data on the change in environmental regulations itself, and instead used economic indicators or environmental quality data. In this paper, we present an analysis of the development of 17 environmental regulations in 24 countries during a period of 35 years. These data show not only the absence of a 'race to the bottom,' but a clear 'race to the top.' A downward competition can therefore be ruled out merely on the basis of the descriptive data. A statistical explanatory model clearly displays that the overwhelmingly upward move of environmental regulation is mostly driven by supranational cooperation at the EU level and the integration of countries into international environmental regimes.

References

Chua, Swee. 1999. "Economic Growth, Liberalization, and the Environment: A Review of the Economic Evidence." *Annual Review of Energy and the Environment* 24:391–430.

Drezner, Daniel W. 2001. "Globalization and Policy Convergence." *International Studies Review* 3:53–78.

Ganghof, Steffen, and Philipp Genschel. 2008. "Taxation and Democracy in the EU." *Journal of European Public Policy* 15(1): 58–77.

Hoberg, George. 2001. "Trade, Harmonization, and Domestic Autonomy in Environmental Policy." *Journal of Comparative Policy Analysis: Research and Practice* 3:191–217.

Holzinger, Katharina. 2003. "Common Goods, Matrix Games and Institutional Response." *European Journal of International Relations* 9(2): 173–212.

Holzinger, Katharina, and Christoph Knill. 2004. "Competition and Cooperation in Environmental Policy: Individual and Interaction Effects." *Journal of Public Policy* 24, (1): 25–47.

Holzinger, Katharina, and Christoph Knill. 2005. "Causes and Conditions of Cross-National Policy Convergence." *Journal of European Public Policy* 12(5): 775–796.

Holzinger, Katharina, Christoph Knill, and Thomas Sommerer. 2008. "Environmental Policy Convergence: The Impact of International Harmonization, Transnational Communication, and Regulatory Competition." *International Organization* 62(4): 553–587.

Holzinger, Katharina, and Thomas Sommerer. 2011. "'Race to the Bottom' or 'Race to Brussels?': Environmental Competition in Europe." *Journal of Common Market Studies* 49(2): 315–339.

Jänicke, Martin, and Klaus Jacob. 2004. "Lead Markets for Environmental Innovations: A New Role for the Nation State." *Global Environmental Politics* 4(1): 29–46.

Jänicke, Martin. 2005. "Trend-Setters in Environmental Policy: The Character and Role of Pioneer Countries." *European Environment* 15(2): 129–42.

Keohane, Robert O., and Joseph S. Nye Jr. 2000. "Globalization: What's New? What's Not? (And So What?)" *Foreign Policy* 118:104–12.

Konisky, David M. 2007. "Regulatory Competition and Environmental Enforcement: Is There a Race to the Bottom?" *American Journal of Political Science* 51(4): 853–72.

Oates, Wallace E., and Robert M. Schwab. 1988. "Economic Competition among Jurisdictions: Efficiency Enhancing or Distortion Inducing?" *Journal of Public Economics* 35(3): 333–54.

Potoski, Matthew. 2001. "Clean Air Federalism: Do States Race to the Bottom?" *Public Administration Review* 61(3): 335–42.

Scharpf, Fritz W. 1997. "Introduction: The Problem-Solving Capacity of Multi-level Governance." *Journal of European Public Policy* 4(4): 520–538.

Vogel, David. 1995. *Trading Up: Consumer and Environmental Regulation in a Global Economy*. Cambridge, MA: Harvard University Press.

Vogel, David J. 2000. "Environmental Regulation and Economic Integration." *Journal of International Economic Law* 3(2): 265–79.

Xing, Yuqing, and Charles D. Kolstad. 2002. "Do Lax Environmental Regulations Attract Foreign Investment?" *Environmental and Resource Economics* 21:1–22.