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7 The gap approach: what affects the direction of environmental policy convergence?

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7.1 INTRODUCTION

This chapter deals with the following sub-set of questions of the research project:

(1) What is the direction of policy convergence; i.e., does convergence coincide with an upward ('race-to-the-top') or downward trend ('race-to-the-bottom')?
(2) What institutional and economic factors (as well as other potentially relevant variables) can explain upward or downward patterns of environmental policy convergence?
(3) To what extent do our empirical findings vary across different policy *dimensions* (presence-of-policies and policy settings) as well as across various policy *types* (trade-related versus non-trade-related policies and obligatory versus non-obligatory standards)?

Theoretically, this chapter builds upon delta-convergence, dealing with convergence towards an exemplary model (Heichel, Pape and Sommerer 2005). Methodologically, this chapter builds on the so-called gap approach, based on an assessment of the gaps between individual country policies on the one hand and a certain policy benchmark – for example the best practice available – on the other, over different points in time. An average policy gap change in the direction of the benchmark then points at delta-convergence as well as at a 'race-to-the-top', provided that the benchmark is the best practice.

This approach is complementary to the 'classical' ones as well as to the pair approach. On the basis of aggregate descriptive data and the concept of sigma-convergence, the 'classical' approach (chapter 5) primarily dealt with the degree of convergence. By calculating changes in the regulatory mean, furthermore, an idea of the direction of convergence could be given. In the present chapter, we further specify the direction of convergence by working with a benchmark. In addition to that, contrary to the simple calculation of the regulatory mean, the gap approach also allows for the inclusion of nominal data. The pair approach (chapter 6) then moved to the explanation of the patterns observed but only focused on the degree of convergence. The present chapter adds to the picture the explanation of the direction of convergence.

The structure of this chapter is as follows. The next section (7.2) explains in some detail how the gap approach actually works. This is followed by a descriptive analysis of the development of policy gaps in our sample of twenty-four countries in section 7.3. Thus, we obtain the necessary data for the dependent variable – policy gap change – for the subsequent explanatory analysis. Section 7.4 serves to formulate specific hypotheses for this analysis and to revisit the independent variables in the light of the gap approach. Whereas section 7.5 briefly describes the procedure followed in the explanatory analysis, section 7.6 presents the results of our regressions and discusses the findings. In section 7.7, more general conclusions are formulated and a link is established with the findings of the 'classical' analysis of chapter 5 and, particularly, the pair approach of chapter 6.

7.2 THE GAP APPROACH

7.2.1 Basic methodology

The gap approach is based on the following procedure. The level of each environmental policy item being in force in country A . . . Z – or 'policy level' (PL) – is compared to a benchmark level in order to measure the distance – or 'policy gap' (PG) – for each country to this benchmark. Since convergence is a time-related phenomenon, this is done at different points in time. As benchmark we use what we call the 'strictest available policy option' (SAPO), which is defined as the most ambitious or best practice level of the environmental policy item that is available in a country set in a certain period of time. As chapter 5 has already shown that 'races-to-the-bottom' do not occur in our data set, we have chosen the *strictest* (rather than the laxest) policy as a benchmark. This implies that sometimes the SAPO is a minimum level (e.g., limit values for polluting substances), sometimes a maximum level (e.g., eco tax). Nonetheless, in order to assess comparable policy gap changes, we opt for *positive* gap scores for both cases. In mathematical terms:

$$\begin{aligned} &PG_{A...Z} = |SAPO - PL_{A...Z}|, \\ &\text{for } \; T_1, T_2, T_3 \end{aligned} \tag{1}$$

However, we are not interested in the absolute policy gaps of countries with regard to a number of policy items at different points in time, but rather in the *change* of policy gaps over time. After all, delta-convergence refers to decreasing distances of countries' policies towards an exemplary model over time. If delta-convergence occurs, in other words, policy gaps change into the direction of the exemplary model from T_1 to T_2, for example. With that, *'policy gap change'* (*PGC*) is our dependent variable.

$$\begin{aligned} &PGC_{T_1-T_2} = PG_{T_1} - PG_{T_2}, \\ &\text{for country A...Z.} \end{aligned} \tag{2}$$

If PGC > 0, the policy gap at T_1 is bigger than at T_2. This implies that the gap has decreased over time and that delta-convergence is present. And the higher the score, the more convergence. If PGC < 0, the gap has increased. If PGC $= 0$, there is obviously no change at all.

7.2.2 Calculating policy gap change with the ENVIPOLCON data set

As mentioned, we use as our benchmark the 'strictest available policy option' (SAPO) of each policy that is available in a country set in a certain period of time. The set of policies (N $=$ 40), the set of countries (N = 24) and the measurement points in time (1970, 1980, 1990, 2000) are given with the ENVIPOLCON data set. Regarding the choice of the SAPO, however, two choices are still possible. On the one hand, we can take the one and only SAPO for each policy item for the *entire* period (1970–2000) or we can choose for the three SAPOs for each policy item in the respective *decades* (1970s, 1980s, 1990s). We decided to use the second option. The choice for *decade* SAPOs – instead of *overall* SAPOs – is based on substantive and methodological grounds. First of all, one can argue that it is invalid to compare, for example, a policy item of 1970 with a benchmark from the year 2000 (which is likely to be the strictest option in the ENVIPOLCON data set in most cases). Politically, socially and technically, these two policy levels are only indirectly related, or even unrelated, given the strong separation in terms of time. Therefore it is better to compare policy levels with SAPOs which are closer in time, i.e., in our case, using the decade intervals provided by our data set. Methodologically, the use of overall SAPOs would imply that many policy gaps in 1970 – and even in 1980 and 1990 – will be high, given that many policies in the year 2000 are likely to be much stricter than their predecessors. This will lead to a decreasing variance in the data set for 1970 (and, to a lesser extent, for 1980 and 1990), lowering the chance of finding significant results in the regressions.[1] These methodological effects are largely absent if we use *decade* SAPOs instead of overall SAPOs.

Using the ENVIPOLCON data set implies having both *metric* and *nominal* data. For policy settings, which are metric data, we selected the strictest values as benchmarks in each decade. The gap is then simply the (metric) difference between the decade benchmark and a country's setting. For the presence of environmental policies, which are nominal data, the benchmark is the mere existence of

[1] It should be noted that the effect of decreasing variance in earlier decades is further strengthened by our normalisation procedure, which has a bias towards suppressing the size of policy gaps and policy gap changes in the case of bigger absolute gaps (see below).

the policy in national environmental policy. The possible scores for those items are simply 0 (absence of policy) or 1 (presence of policy). Countries that do not have the policy at stake at a certain point in time then face a gap equal to 1 (1 minus 0). It should be noted, moreover, that the gap approach, unlike the previous chapters, does not distinguish between the categories of 'presence-of-policy' and 'policy instrument'. The reason is that instruments as such cannot possibly be ranked according to strictness.

Thus building on a mixed data set, covering both metric and nominal data, the question is how to deal with this in the gap approach. For substantive and methodological reasons, we constructed two sub-sets of data, which can be compared in the descriptive and explanatory analyses below. The first sub-set consists of all forty policy items. All of those, including the settings items among them, are now dealt with as 'presence-of-policy' only, implying that the entire sub-set is *nominal* in character. The advantage is that we have all policy items included, the disadvantage that (metric) information is lost. Therefore we create a second sub-set of data, consisting of the twenty-one policy settings, which are now dealt with as *metric* data. In this second case, we lose information on policy items, but win information in terms of metric data. A possible third data sub-set, which combines metric and nominal data, was left out. Most notably, mixing the two types of data would lead to an overestimation of presence-of-policy versus policy settings. This is due to the fact that in our approach the mere introduction of a policy (presence-of-policy), irrespective of its precise content, immediately brings the nominal variable from 0 to 1, whereas even a highly significant tightening of a limit value or the increase of a tax (setting) finds expression only in decimals. A similar effect occurs in the pair approach (chapter 6).

The construction of *aggregated* policy gaps (PG_{Ag}), based on all (or a sub-set) of the forty items for the twenty-four countries at the four points in time, raises another problem. To be able to aggregate gaps over several items – with various units of measurement, at least for the metric data (g/km, mg/l, μg/m^3, dB, etc. . .) – we need to work with *normalised* policy levels (PL_{No}) that transform absolute gaps into comparable but relative ones (between 0 and 1). In order to standardise the settings to a value between 0 and 1, every score on an item is divided by the decade ($SAPO_{Dec}$) concerned. For example, when the decade SAPO is an environmental tax of 180 $/kJ in the 1970s[2] and when all policy levels of countries in 1970 and 1980 are *below* this figure, then this procedure will lead to the SAPO itself scoring 1 and the other values somewhere between 0 and 1. The closer the number gets to zero, the less strict the policy is:

$$PL_{No} = PL/SAPO_{Dec} \tag{3}$$

In the case of environmental standards, however, the SAPO typically represents the lowest score, for example 0.23 mg/l with regard to a substance that pollutes water, while the other levels are *above* this figure. In this case the above procedure will lead to scores of 1 (the SAPO itself) and higher (the other levels). In order to obtain values between 0 and 1, therefore, the scores for this type of setting are once more recoded by calculating 1/x.

$$PL_{No} = SAPO_{Dec}/PL \tag{4}$$

In footnote 1, we have already referred to the fact that this normalisation procedure exhibits a certain bias. It tends to relatively increase the normalised policy gaps and the normalised policy gap changes in the case of lower absolute gaps. Take as a fictive example the policy levels of 2, 4, 6 and 8, with 2 being the SAPO. Normalised, these figures amount to 1.00, 0.50, 0.33 and 0.25. The absolute policy gaps then are 0, 2, 4 and 6, the normalised ones 0.00, 0.50, 0.67 and 0.75. With this example, it becomes obvious that the linear

[2] Remember that the *decade* SAPO has been defined as the strictest available policy option in force in the country set in the decade under consideration. In practice this means that for the 1970s, for example, the decade SAPO may in principle occur either at the measuring point at the beginning of the decade (1970) or at the end (1980) (see also below).

relationship of the absolute figures is lost in the normalised continuum. And more precisely: the lower the absolute policy gap is, the (relatively) higher the normalised one. This also implies that, over time, the normalised policy gap *change* will be relatively higher in the case of lower absolute policy gaps.[3] In an attempt to eliminate this bias, we experimented with other or corrected normalisation procedures. On the basis of fictive examples and calculations, we nonetheless decided to maintain the above normalisation procedure based on decade SAPOs, the main reason being that this procedure produced the same trends in outcomes as more complex normalisation procedures. Under these circumstances, parsimony was preferred.

Following normalisation, the *aggregated* and *mean* policy gaps for each country at each point in time can now be calculated by taking the decade SAPOs (score always 1) minus the normalised policy levels for all policy items concerned (somewhere between 0 and 1). Note that the number of policy items varies with each decade, since not all forty policy items already existed in the 1970s or 1980s (N = 30 for 1970s; N = 38 for 1980s; and N = 40 for 1990s). In mathematical terms, based on formula (1) in the above:

$$\begin{aligned} &PG_{Ag} = \sum|1 - PL_{No}| \,/\, N \text{ policy items}, \\ &\text{for 24 countries}, \\ &\text{in } 1970, 1980, 1990, 2000 \end{aligned} \tag{5}$$

When the aggregated and normalised policy gaps are known for the twenty-four countries at the four points in time, the average gap development for all countries over time can be calculated, giving an overall indication of the direction of policy convergence. Also,

[3] This bias would become particularly pressing if overall SAPOs were used (see above). In that case, the absolute gaps in the 1970s and 1980s would be typically big, but the normalised ones would be (relatively) less so. This would, in other words, suppress the policy gap change in these decades compared to the 1990s. This bias, though, is to a considerable extent overcome by using decade SAPOs instead.

the (normalised and aggregated) policy gap *changes* can be calculated, in accordance with formula (2) above. At that point we will be able to see if and to what extent our data set shows a general trend of delta-convergence and a 'race-to-the-top'.

Before turning to the findings on the basis of the ENVIPOLCON data set, however, two other implications of the use of decade SAPOs should be addressed here. They relate to the descriptive and explanatory analyses respectively. First, by using decade SAPOs we in fact work with three distinct decades: (1) 1970–1980, the policy gaps of which are based on the SAPOs of the 1970s; (2) 1980–1990, the policy gaps of which are based on the SAPOs of the 1980s; and (3) 1990–2000, the policy gaps of which are based on the SAPOs of the 1990s. For calculating policy gap change for 1970–1980, in other words, we need values for the policy gaps in 1970 and 1980 based on the 1970s SAPO, while for calculating policy gap change for 1980–1990 we need the policy gaps in (again) 1980 as well as of course 1990, but now based on the 1980s SAPO. A similar procedure of course applies to calculating policy gap change for 1990–2000. As a result, we end up with two policy gap calculations for each item and country for 1980 and 1990, respectively, however based on different SAPOs. The second point is that for pooled regression analyses (see below) the change of N policies over time is problematic. After all, one can only pool similar variables in a regression. Two options are then possible. Either we take the thirty policy items which were already existent in the 1970s as the basis for all our calculations, but then we will miss information on ten policy items in the analyses. Or we can include all forty policy items in all decades and give those which are still non-existent in the 1970s and 1980s a zero for policy gaps and gap changes, since no policies and no SAPOs were yet available. Although the latter option is less attractive for the outcomes particularly in the 1970s, we nonetheless preferred this one in order not to lose information with regard to the ten policy items which were only introduced in the 1980s or 1990s.

7.3 DESCRIPTIVE ANALYSIS OF THE DEPENDENT VARIABLE

In this section we will present a descriptive account of our dependent variable, based on the ENVIPOLCON data set. As mentioned, the dependent variable for our analysis is policy gap *change*. However, in order to construct this dependent variable, we first have to establish (normalised) *policy gaps*. Hence, the discussion will proceed in two steps. First the normalised policy gaps resulting from our data set will be presented. After that, these gaps will be combined over time so as to map policy gap change, or delta-convergence. In both steps, we will start our discussion with two individual policy items and then move on to the aggregate level of the entire data set.

7.3.1 Two examples

In chapter 6, the example of limit values for lead in petrol was used to explain and make transparent the methodological procedures concerned. For reasons of comparability, we will do the same here. In addition, another example is added – industrial discharges of zinc to surface water – so as to show how different policies may produce different outcomes. Following the procedure set out in the previous section, the policy gaps for all twenty-four countries in the 1970s, 1980s and 1990s are calculated, normalised and averaged for both items. Tables 7.1 and 7.2 summarise the findings. Although we are not interested in the performance of individual countries, but rather in the development of the strictness of policies over time in a group of countries, we have nonetheless taken up scores of individual countries here in order to give the reader an impression of the underlying calculations. In the tables, the overall trend is clear: the policy gaps decrease in each decade. Moreover, the decade SAPOs become stricter over time in both examples.

This can be read from the tables as follows. First, the SAPOs – indicated here by a policy gap of zero (and bold type in the tables) – are consistently found at the *end* of each decade. As a consequence, secondly, the policy gaps of 1980 and 1990 increase (or remain

Table 7.1 *Policy gaps for lead content in petrol, based on decade SAPOs*

	1970s		1980s		1990s	
Country	1970	1980	1980	1990	1990	2000
Austria	1.00	0.63	0.97	0.13	0.67	**0.00**
Belgium	1.00	0.67	0.97	0.91	0.97	**0.00**
Bulgaria	1.00	1.00	1.00	1.00	1.00	0.97
Denmark	1.00	1.00	1.00	1.00	1.00	**0.00**
Finland	1.00	1.00	1.00	0.91	0.97	0.62
France	0.82	0.70	0.97	0.95	0.98	**0.00**
Germany	1.00	**0.00**	0.91	**0.00**	0.62	0.62
Greece	1.00	1.00	1.00	0.97	0.99	0.99
Hungary	0.83	0.79	0.98	0.97	0.99	0.97
Ireland	1.00	0.77	0.98	**0.00**	0.62	**0.00**
Italy	1.00	1.00	1.00	0.96	0.98	0.97
Japan	1.00	1.00	1.00	1.00	1.00	**0.00**
Mexico	1.00	1.00	1.00	1.00	1.00	**0.00**
Netherlands	1.00	0.63	0.97	0.91	0.97	**0.00**
Norway	1.00	0.61	0.97	0.91	0.97	**0.00**
Poland	1.00	1.00	1.00	0.96	0.98	0.97
Portugal	1.00	0.76	0.98	0.97	0.99	0.62
Romania	1.00	1.00	1.00	0.97	0.99	0.97
Slovakia	1.00	1.00	1.00	0.91	0.97	**0.00**
Spain	1.00	0.63	0.97	0.97	0.99	0.97
Sweden	0.79	**0.00**	0.91	0.74	0.90	**0.00**
Switzerland	0.76	0.63	0.97	0.91	0.97	**0.00**
United Kingdom	0.82	0.67	0.97	0.91	0.97	**0.00**
USA	1.00	1.00	1.00	1.00	1.00	**0.00**
Mean	*0.96*	*0.77*	*0.98*	*0.83*	*0.94*	*0.36*

constant in case there is no policy present) when they are calculated on the basis of the SAPOs of the *coming* decade, compared to the gaps based on the SAPOs of the *previous* decade. These outcomes already point at stricter decade SAPOs over time, implying delta-convergence for both cases.

On this basis, we can now calculate the development of the policy gaps over time, i.e., policy gap *change*, being the indicator of

Table 7.2 *Policy gaps for zinc in industrial discharges to surface water, based on decade SAPOs*

	1970s		1980s		1990s	
Country	1970	1980	1980	1990	1990	2000
Austria	1.00	1.00	1.00	0.83	0.93	0.80
Belgium	0.80	0.80	0.90	0.90	0.96	1.00
Bulgaria	1.00	1.00	1.00	1.00	1.00	0.80
Denmark	1.00	1.00	1.00	1.00	1.00	1.00
Finland	1.00	1.00	1.00	1.00	1.00	1.00
France	1.00	1.00	1.00	0.90	0.96	0.90
Germany	1.00	1.00	1.00	**0.00**	0.60	**0.00**
Greece	1.00	1.00	1.00	1.00	1.00	1.00
Hungary	0.80	0.80	0.90	0.50	0.80	0.80
Ireland	1.00	1.00	1.00	1.00	1.00	1.00
Italy	1.00	**0.00**	0.50	**0.00**	0.60	0.60
Japan	1.00	0.80	0.90	0.90	0.96	0.96
Mexico	1.00	1.00	1.00	1.00	1.00	0.98
Netherlands	1.00	1.00	1.00	1.00	1.00	1.00
Norway	1.00	1.00	1.00	1.00	1.00	1.00
Poland	1.00	1.00	1.00	1.00	1.00	0.90
Portugal	1.00	1.00	1.00	0.90	0.96	0.96
Romania	1.00	1.00	1.00	1.00	1.00	0.60
Slovakia	1.00	1.00	1.00	1.00	1.00	0.80
Spain	1.00	1.00	1.00	0.83	0.93	0.93
Sweden	1.00	1.00	1.00	1.00	1.00	1.00
Switzerland	1.00	0.50	0.75	0.75	0.90	0.90
United Kingdom	1.00	1.00	1.00	1.00	1.00	0.60
USA	1.00	1.00	1.00	1.00	1.00	0.32
Mean	*0.98*	*0.91*	*0.96*	*0.85*	*0.94*	*0.83*

delta-convergence. This operation leads to the results shown in table 7.3. Here only the mean policy gap changes are presented for the three decades (as we are interested in policies, not in individual countries). Obviously, delta-convergence exists for both items over the entire period, but is much higher for lead policy than for zinc policy. Also, it is shown that delta-convergence does not necessarily increase incrementally over the decades, at least not for individual

Table 7.3 *Mean policy gap changes for lead and zinc*

Item	1970–1980	1980–1990	1990–2000
Lead	0.19	0.15	0.58
Zinc	0.07	0.10	0.11

policy items. For lead, considerable convergence in the 1970s is followed by less convergence in the 1980s and again followed by strong convergence in the 1990s. For zinc, we observe another pattern. Here delta-convergence is lower, but rather stable over time.

7.3.2 Aggregated results

Having established the policy gaps for all forty policy items and for all countries over time, the figures can now be aggregated. As set out in section 7.2, we will do so for two sub-sets which produce the most meaningful results, i.e., the sub-set of twenty-one settings items with metric data and the subset of all forty policy items reduced to nominal data, indicating 'presence-of-policy'. In addition, we have made calculations for two sets of sub-groups. On the one hand, a distinction is made between the regulation of products (P, eleven items), the regulation of production processes (PP, fifteen items) and policies that are not directly related to trade (i.e., regulation of neither products nor processes; NPP, fourteen items; see further chapter 4). On the other hand, policies that became subject to international harmonisation before or during the period 1970–2000 (or obligatory policies; O, nineteen items) and policies not subject to international harmonisation (non-obligatory policies; NO, twenty-one items) are distinguished. The results are shown in table 7.4.

Overall, delta-convergence exists and increases each decade. For settings, convergence amounts to 0.09 (1970s), 0.20 (1980s) and 0.21 (1990s) respectively; for presence-of-policy, these scores are 0.17, 0.19 and 0.33 respectively (minimum score = −1.00, maximum score = +1.00). This outcome once again strongly falsifies the 'race-to-the-bottom' thesis. Also, it confirms similar outcomes based

Table 7.4 *Aggregate and mean policy gaps and policy gap changes for policy settings, all policy items reduced to presence-of-policy and sub-groups*

	Mean policy gap						Mean gap change		
	1970 (SAPO 70s)	1980 (SAPO 70s)	1980 (SAPO 80s)	1990 (SAPO 80s)	1990 (SAPO 90s)	2000 (SAPO 90s)	1970–1980	1980–1990	1990–2000
Settings	***0.96***	***0.87***	***0.91***	***0.71***	***0.82***	***0.60***	**0.09**	**0.20**	**0.21**
Sub-groups:									
P	*0.95*	*0.84*	*0.86*	*0.57*	*0.75*	*0.43*	0.10	0.29	0.32
PP	*0.97*	*0.86*	*0.95*	*0.84*	*0.91*	*0.74*	0.11	0.12	0.18
NPP	*0.96*	*0.90*	*0.91*	*0.75*	*0.77*	*0.63*	0.06	0.17	0.15
O	*0.96*	*0.87*	*0.91*	*0.72*	*0.83*	*0.58*	0.09	0.20	0.25
NO	*0.96*	*0.86*	*0.91*	*0.71*	*0.81*	*0.63*	0.10	0.20	0.17
Presence-of-policy	***0.90***	***0.73***	***0.79***	***0.60***	***0.62***	***0.29***	**0.17**	**0.19**	**0.33**
Sub-groups:									
P	*0.92*	*0.65*	*0.72*	*0.53*	*0.53*	*0.25*	0.26	0.19	0.28
PP	*0.94*	*0.82*	*0.83*	*0.60*	*0.66*	*0.30*	0.12	0.23	0.35
NPP	*0.93*	*0.81*	*0.87*	*0.68*	*0.68*	*0.32*	0.12	0.18	0.37
O	*0.87*	*0.66*	*0.71*	*0.51*	*0.51*	*0.22*	0.21	0.20	0.29
NO	*0.94*	*0.82*	*0.87*	*0.69*	*0.72*	*0.35*	0.12	0.18	0.36

Note:
P = standards for product; PP = standards for production processes; NPP = policies not directly related to products or production processes; O = obligatory policies; NO = non-obligatory policies.

on different convergence assessment methodologies in chapters 5 and 6. Generally speaking (and notwithstanding the observation that the presence-of-policy sub-set exhibits a certain stabilisation in the 1970s and 1980s, whereas the settings sub-set does so in the 1980s and 1990s), delta-convergence is higher in the 1980s than in the 1970s and again higher in the 1990s.

Furthermore, convergence is definitely more pronounced for presence-of-policy than for settings (with the 1980s being an exception). This observation confirms the first hypothesis (H 1) in chapter 3, which states that the degree of policy convergence will be highest for policy presence and lowest for policy settings. Regarding the sub-groups, most figures are close to the overall picture. However, considering mean convergence scores over three decades and both data sets, product standards (P), process standards (PP) and obligatory policies (O) tend to converge most, and policies which are not related to trade (NPP) as well as non-obligatory policies (NO) tend to converge the least (although, admittedly, the differences are fairly marginal). This observation has to be related to hypothesis H 4.2 in chapter 3, which says that under a situation of regulatory competition, product standards will become stricter and process standards weaker. This hypothesis is not confirmed: both product and process standards do become stricter at about equal rate. It is interesting to note, however, that product standards exhibit relatively high rates throughout the three decades, whereas process standards converge most strongly in the 1990s. This may reflect the regulatory activity of international institutions such as the EU, which first focused on the elimination of barriers to trade, i.e., the harmonisation of standards for tradable products, and only later broadened their repertoire to process standards as well as policies not related to trade.

7.4 INDEPENDENT VARIABLES AND HYPOTHESES

In the descriptive part we have seen that environmental policies in our twenty-four countries exhibited clear trends developing towards the SAPOs over time. This was true both for the mere existence of policies (presence-of-policy, assuming that having a policy regarding a given problem can be interpreted as 'stricter' than having no policy at all) and for the strictness of the policy settings. The remainder of this chapter is devoted to finding an explanation for this 'race-to-the-top'. In this section we will formulate a set of hypotheses, specifically adapted to the gap approach but based on the causal mechanisms and the general hypotheses set out in chapter 3 of this book. These mechanisms relate to international harmonisation, transnational communication, regulatory competition and a number of complementary other factors. The gap approach does not require as much adaptation to the independent variables as the pair approach, discussed in the previous chapter. Basically, we follow the operationalisation as set out in chapter 4. A few specific points will nevertheless be touched upon here. As in chapter 6, changes in the policy gap in a given period will be explained by variables referring to absolute figures at the beginning of that period, for instance EU membership or GDP per capita. As mentioned there, the independent variables are conceived as 'potentials' which are supposed to fuel processes actually taking place in the following years.

7.4.1 International harmonisation

As regards the direction of convergence, policy harmonisation in the EU may be expected to have two parallel effects. First, due to the EU's continuous efforts to harmonise policies, member states are obliged to adopt the same range of policies (presence-of-policy) and – at least to some extent – also the same range of instruments. In the gap approach, the mere adoption of policies and instruments in an increasing number of countries is conceptualised as a reduction of the average policy gap between the countries in the sample. The role played by EU harmonisation in disseminating policies and policy instruments among its member states across a wide range of environmental issues can thus be seen as one leading to convergence towards the SAPO, or upward convergence. Second, and more specifically, the EU may have an impact on the level of settings. Compared to other international institutions, the EU has strong mechanisms for reaching relatively high levels of harmonisation. Particularly important in this respect are the various opportunities for high-regulating member states to promote their policies at the European level, for instance by influencing processes of problem definition and agenda setting. In addition, individual countries usually have the right to maintain stricter standards unilaterally, which helps to keep up a dynamic towards higher levels of regulation (see further chapter 3). This leads to the following hypothesis:[4]

> **(H 2.2.1)**: *EU membership at t_1 will lead to convergence towards the top in the period from t_1 to t_2.*

Moreover, new member states are forced to adopt the *acquis communautaire* within a relatively short period of time. In most cases, this will force countries to catch up with existing EU policies. Therefore:

> **(H 2.2.2)**: *Accession to the EU from t_1 to t_2 will lead to convergence towards the top during the same period.*

As for the operationalisation of the EU variables, it must be noted that 'membership', as for most other variables, refers to the situation *at the beginning of* the period (t_1). The 'accession' variable departs from this practice: here it is decisive if accession talks started *during* the period under consideration (from t_1 to t_2) (see further chapter 4).

Other international institutions are supposed to have the same effect as the EU as regards the dissemination of policies and probably also instruments as such. At the moment a state joins an international treaty, it commits itself to implementing the measures prescribed by that treaty. However, these institutions have less powerful mechanisms at their disposal for reaching high levels of

[4] The numbering of hypotheses refers to the set of basic hypotheses developed in chapter 3 of this book.

harmonisation than the EU. As far as international treaties contain policy settings at all, these usually entail minimum harmonisation, i.e., countries are allowed to introduce and maintain stricter policies (see further chapter 3). Hence, accession to such institutions (i.e., all institutions in our sample minus the EU), weighed by their obligatory potential as set out in chapter 4, may be expected to lead to an upward shift of the mean, but to a lesser extent than accession to the EU.

> **(H 2.2.3)**: *Accession to international institutions (weighed by obligatory potential) from t_1 to t_2 will lead to convergence towards the top during that same period, however to a lesser extent than accession to the EU.*

7.4.2 Transnational communication

Generally speaking, enhanced transnational communication may be expected in the long term to contribute to the adoption of more similar ranges of policies and instruments. This effect, moreover, may be expected to be continuous, i.e., throughout membership of the institution. For presence-of-policy, therefore, institutional membership (weighed by communicative potential according to the procedure described in chapter 4) is hypothesised to lead to upward convergence. As regards the specific level of settings, lesson-drawing, transnational problem-solving and emulation may generally be expected to induce the adoption of stricter policies. Good examples, models and best practices, promoted either by individual 'pioneer' countries or by international institutions, play an important role in such processes (see further chapter 3).

> **(H 3.2)**: *High institutional membership at t_1 (weighed by communicative potential) will lead to convergence towards the top in the period from t_1 to t_2.*

7.4.3 Trade

As discussed in detail in chapter 3, trade is generally expected to have a downward effect on the direction of convergence. However, a distinction has to be made between process standards (P) and product standards (PP). According to the theory, countries are tempted to lower *process* standards in the face of competitive pressures, i.e., convergence to the bottom. In the case of standards for tradable *products*, a race-to-the-top is expected as countries are generally allowed to erect unilateral trade barriers for health and environmental reasons, for instance under EU and WTO rules (see further chapter 3).

> **(H 4.2)**: *For process standards, a high level of trade openness at* t_1 *will lead to a race-to-the-bottom in the period from* t_1 *to* t_2*, while for product standards a race-to-the-top is expected.*

7.4.4 Other variables

Whereas the main focus of the ENVIPOLCON project is on the influence of international institutions and international trade on environmental policy convergence, we also test a number of additional, mainly domestic variables which may be expected to be relevant. With one exception (see below), the set of other variables covered in the present chapter corresponds with that of chapter 6, i.e., environmental problem pressure, income, green party strength, cultural openness and time.

Environmental problem pressure is operationalised with the help of two indicators: industrial CO_2 emissions per square kilometre and population density. High environmental problem pressure is expected to lead to higher demand for environmental policies and thus to upward convergence.

> **(H 5.2.1)**: *High environmental problem pressure at* t_1 *(operationalised as industrial* CO_2/km^2 *and population density) will lead to convergence towards the top during the following period.*

Following the theory of the 'Environmental Kuznets Curve' a higher income (expressed as GDP per capita) is supposed to lead to upward convergence in two ways. First, higher income is generally associated with a higher degree of industrialisation, higher levels of environmental pollution and thus with higher demand for policy (see above). Second, political demand for the 'luxury good' of environmental policy may be assumed to be higher with increasing income (see further chapter 3).

(H 5.2.2): *High income at* t_1 *will lead to convergence towards the top during the following period.*

Similarly, the strength of green parties (operationalised with the help of three indicators: electoral success, membership in parliament and participation in government; cf. chapter 4) is expected to raise the public and political demand for environmental policies. Their increase is thus likely to lead to upward convergence.

(H 5.2.3): *High influence of green parties at* t_1 *will lead to convergence towards the top during the following period.*

Cultural openness replaces the variable of cultural similarity used in chapter 6. For this purpose, the pairwise data on which cultural similarity was based (common borders, common language, common historical and religious tradition) were reassigned to individual countries. The degree of cultural openness of a country, in other words, represents the accumulated cultural similarity with other countries in the sample. This variable may be expected to increase the receptiveness of countries for stimuli from outside.

(H 5.2.4): *High cultural openness at* t_1 *will lead to convergence towards the top during the following period.*

Furthermore, a time variable is included in the calculations of the present chapter. As in chapter 6, it controls for the time dependence of the models and covers a range of factors that may contribute to the development of environmental policy in general, but are not further specified in this project, such as increasing scientific knowledge, technological development or events like Seveso or Chernobyl.

In chapter 6, finally, the pairwise variable of pre-existing policy similarity was included. Its equivalent for the gap approach would have been the pre-existing gap: it might have been hypothesised that a low gap at t_1 (indicating a 'policy leader') would lead to low convergence during the following period. Or conversely: that a high gap at t_1 (indicating a 'policy laggard') would lead to high convergence during the following period. However, both effects cannot be considered particularly surprising. After all, convergence starting from a high policy gap will *always* lead to relatively high gap change when compared to convergence starting from a low policy gap, since the latter already is close to the SAPO (and hence, it simply *cannot* change much). Therefore, these effects are not further investigated here.

7.5 METHOD OF ANALYSIS

As outlined in the above, the dependent variable in the present analysis is *policy gap change* over time. To construct this dependent variable, we use two data sets. First, analyses are made with the entire set of forty policy items treated as 'presence-of-policy' (nominal scores). Second, the twenty-one settings (metric scores) are taken as the basis for the dependent variable. It has already been explained above why these two data sets were chosen for the analysis of delta-convergence. Analyses are then carried out for both data sets in their entirety as well as for the sub-groups mentioned above.

The methodology used is basically linear *regression* analysis with a *stepwise* approach. As such, it closely builds on chapter 6. Consequently, eight models are applied in which different (sets of) independent variables are isolated or combined to consider their effects on the dependent variable, i.e., policy gap change.[5] In our model 1, only the EU-related independent variables are included. In a next step, in model 2, the variables on 'access to institutions' and 'institutional membership' are added. In model 3, 'trade openness' is the only independent variable. In model 4, the EU-related

[5] In fact the main difference with chapter 6 is the absence of the variable of pre-existing policy similarity, resp. the pre-existing policy gap (see above). Hence, the equivalent of regression model 7 in chapter 6 is missing in the present chapter.

variables and the trade variable are combined, whereas all the institutional and trade variables are represented in model 5. In a next step, only the other factors are included (model 6). Model 7 covers all institutional, trade and other variables. Model 8, finally, adds the time variable.

As it turned out, regressions for single decades (1970s, 1980s, 1990s) as well as for the entire period (1970–2000) did not provide any significant outcomes, due to the relatively low number of countries in the sample. For that reason, we pooled the data of the three decades in our models. In doing so, we increased the number of observations from N = 24 countries to N = 72. This led to more valid outcomes, but the price paid for this, to be sure, was that no conclusions with regard to single decades can be drawn.

All models were tested for multicollinearity. With one exception, the tests showed that the independent variables in our analysis do not interfere to an unacceptable level (VIF-values between 1 and 4).[6] Therefore the additional analyses deployed in chapter 6 – bivariate regressions and orthogonalisation – are absent in this chapter. Unacceptably high VIF-values (>10) were found only for institutional membership and the time variable in model 8.

7.6 FINDINGS

This section presents and discusses the results of the regression analysis for pooled decades for, respectively, all forty policy items reduced to presence-of-policy (table 7.5), twenty-one settings items (table 7.6) and a number of sub-groups (table 7.7). The figures in the tables are standardised coefficients, or beta-coefficients, conveying the strength of the variables relative to each other.

With all forty items reduced to presence-of-policy, and limiting ourselves to those models exhibiting an adjusted R^2 above 0.3 (i.e. models 2, 5 and 7), accession to institutions and institutional

[6] VIF (variance inflation factors) is a measure for multicollinearity. VIF-values are the reverse of Tolerance values or Tol-values (VIF = 1/Tol).

Table 7.5 *Regression results, policy gap change for all forty policy items reduced to presence-of-policy, pooled decades*

	Models							
	1	2	3	4	5	6	7	8
Institutional variables								
EU membership	.337**	.083		.354**	.109		.094	.308*
EU accession	.429**	.145		.428**	.119		.078	.122
Accession to institutions		.386**			.411**		.388**	.298*
Institutional membership		.311**			.354**		.324*	–.502#
Trade openness			–.019	–.066	–.207*		–.219*	–.131
Other variables								
GDP per capita						.186	.051	.264
Green parties						.427**	.083	.019
Cultural openness						–.036	–.013	.038
Industrial CO_2 emissions						–.199	–.153	–.130
Population density						–.045	.032	–.041
Time (Decade 1980–1990)								.367*#
Time (Decade 1990–2000)								.906**#
Adjusted R^2	.170	.418	–.014	.163	.450	.193	.435	.505

Note:
N = 72, * = $p<0.05$; ** = $p<0.01$; # = VIF-value>10.

Table 7.6 *Regression results, policy gap change for settings (21 settings items), pooled decades*

	Models							
	1	2	3	4	5	6	7	8
Institutional variables								
EU membership	.325**	.060		.306*	.068		–.010	.030
EU accession	.217	–.026		.218	–.033		.013	.087
Accession to institutions		.265*			.272*		.259*	.231
Institutional membership		.413**			.425**		.366*	.287#
Trade openness			.130	.074	–.060		–.109	–.140
Other variables								
GDP per capita						.295*	.130	.172
Green parties						.273*	–.025	.046
Cultural openness						.185	.217	.213
Industrial CO_2 emissions						–.083	–.061	–.086
Population density						.015	.084	.079
Decade 1980–1990								.270#
Decade 1990–2000								.050#
Adjusted R^2	.076	.316	.003	.068	.309	.231	.337	.377

Note:
N = 72, * = $p<0.05$; ** = $p<0.01$; # = VIF-value>10.

Table 7.7 *Regression results, policy gap change for various sub-groups, pooled decades*

	All policy items reduced to presence of policy						Settings (21 settings items)					
	All	P	PP	NPP	O	NO	All	P	PP	NPP	O	NO
Institutional variables												
EU membership	.094	.397*	.045	–.144	.312*	–.113	–.010	.023	.062	–.151	.002	–.024
EU accession	.078	.041	.351**	–.202	.176	–.023	.013	–.043	.337*	–.353*	–.034	.077
Accession to institutions	.388**	.382*	.119	.426**	.421**	.272**	.259*	.189	–.021	.499**	.205	.275
Institutional membership	.324*	–.327	.432**	.568**	–.160	.664**	.366*	.368	.208	.219	.418*	.201
Trade openness	–.219*	–.060	–.081	–.331**	–.127	–.248**	–.109	–.009	.018	–.333**	–.049	–.169
Other variables												
GDP per capita	.051	.303	.039	–.159	.186	–.075	.130	.072	.297*	–.134	.174	.034
Green parties	.083	.124	.031	.052	.034	.105	–.025	–.064	.039	–.024	–.059	.032
Cultural openness	–.013	–.175	.034	.070	–.106	.068	.217	.060	.212	.259*	.152	.257*
Industrial CO_2 emissions	–.153	–.147	–.087	–.093	–.170	–.104	–.061	–.043	–.059	–.034	–.055	–.056
Population density	.032	–.094	.066	.092	–.007	.057	.084	.049	.023	.140	.044	.121
Adjusted R^2	.435	.119	.401	.457	.207	.587	.337	.135	.296	.244	.321	.211

Note:

P = standards for product; PP = standards for production processes; NPP = policies not directly related to products or production processes; O = obligatory policies; NO = non-obligatory policies; N=72, *$p<0.05$ **$p<0.01$.

membership show the strongest and most significant effects (table 7.5). It must be remembered here that *accession* to international institutions is modelled along the lines of a possible harmonisation effect (i.e., data on accession to international institutions are weighed according to their *obligatory* potential), whereas institutional *membership* refers to transnational communication (i.e., data on institutional membership are weighed according to their *communicative* potential, cf. chapter 4). This broadly confirms our theoretical expectations: both the harmonisation effect produced by accession to international institutions (except the EU) and the communication effect produced by membership in international institutions (including the EU) turn out to lead to gap change in an upward direction, or delta-convergence (hypotheses H 2.2.3 and H 3.2). As regards harmonisation, however, we expected the effect of EU accession and membership to be stronger than that of the other international institutions, covered by the variable of 'accession to institutions' (hypotheses H 2.2.1 and H 2.2.1 v. H 2.2.3). This turns out not to be the case. EU membership and EU accession have relatively strong and significant effects only in models 1 and 4, but both models show low values for the adjusted R^2. The EU effects vanish when institutional, trade and other variables are added (models 2, 5 and 7), suggesting that the latter have more explanatory power than EU accession and membership.

In models 5 and 7, moreover, trade openness has a notable and significant *negative* effect on gap change. This is not what we had anticipated. To be sure, the present finding cannot be interpreted by claiming that trade openness leads to a race-to-the-bottom. In the descriptive analysis in this chapter, after all, no race-to-the-bottom was found at all. The negative sign of the coefficient might rather be taken as an indication that countries that are less open to trade converge more to the top than countries that are more open to trade. This is of course still contrary to expectations and hard to explain.

As for the other variables, only green parties in model 6 shows a significant effect on gap change. However, the overall significance of this model is very low and the effect vanishes in model 7. None of the other domestic variables achieves any significant effect. Hence, international factors dominate the domestic ones in terms of explanation. This is in fact very much in line with the overall design of the explanatory model of this study, in which the domestic factors are considered control variables (chapters 3 and 4).

In sum, institutional variables seem to exhibit most explanatory power for delta-convergence with regard to presence-of-policy. Both membership of and accession to international institutions demonstrate the expected positive effect on gap change. Strikingly, however, the EU effect turns out to be more ephemeral than expected. Furthermore, trade openness is found to have a slightly negative effect on gap change.

Turning now to settings as dependent variable, most of the trends described above are replicated (table 7.6). Accession and institutional membership again show the strongest and most significant effects. Whereas for presence-of-policy the standardised coefficients for both variables were of approximately similar magnitude, however, institutional membership now consistently dominates over accession to institutions. Remembering again the fact that the accession variable reflects harmonisation potential of international institutions, whereas the membership variable refers to their communicative potential, this finding suggests the paramount importance of transnational communication in the upward convergence of settings. This effect as such is not unexpected (H 2.2.3 and H 3.2), but its relative size is. Processes such as lesson-drawing, transnational problem-solving and emulation, in other words, must to a considerable extent be held accountable not only for convergence in the adoption of policies as such (see above) but also for their increasing strictness. As for presence-of-policy, and just as surprisingly (cf. H 2.2.1 and H 2.2.2), the impact of the two EU variables on policy gap change for settings is low and mostly not significant.

In contrast with the calculations for presence-of-policy, trade openness does not produce any significant results for settings. This again, although less outspokenly than above, is in contrast with our theoretical expectations (H 4.2).

Also the other variables exhibit a similar pattern as for presence-of-policy. For settings, not only green parties but also GDP per capita have significant effects in model 6, but combined with international factors in model 7, these effects disappear.

To conclude, the predominance of institutional variables for the explanation of delta-convergence, observed for presence-of-policy, is confirmed by the models for settings. Within the institutional realm, it is once again striking that the specific EU effect, based on harmonisation with a high obligatory potential, turns out to be insignificant compared to that of harmonisation effects of accession to other international institutions and particularly transnational communication.

Table 7.7 presents the results of the regression analysis for a number of sub-groups of policy items. The left part of the table takes as the dependent variable all forty policy items, as well as the sub-group selections from these, reduced to presence-of-policy. The right part does the same for the settings items in the sample. The table summarises the results for the model in which all independent variables are included, except time (for reasons of multicollinearity, see above). Hence, the figures in the two columns entitled 'All' correspond with those listed under model 7 in tables 7.5 and 7.6 respectively. The other columns present figures for standards for the various sub-groups as introduced earlier.

Unfortunately, not too much additional information can be drawn from this exercise. First, it must be noted that only four out of ten sub-group models reach an acceptable level of overall model significance (adjusted $R^2 > 0.3$): PP, NPP and NO for presence-of-policy, as well as O for settings.[7] This is inevitably related to the low number of items in each sub-group. Second, as far as results are significant, they basically confirm the findings for the full sets of

[7] For the partial sub-group models (models 1–6, not presented in table 7.7), overall model performance is even lower.

presence-of-policy and settings, discussed above, without allowing for much further specification.

The sub-group analysis replicates the strong and significant positive effect of institutional membership on delta-convergence. It does so for all four sub-groups producing overall model significance. As far as the sub-group models with reasonable overall significance are concerned, the sub-groups NPP and NO regarding presence-of-policy confirm the lower but still notable effect of accession to international institutions. The latter finding may seem somewhat surprising. Remembering that accession to institutions is modelled according to their obligatory potential, one would expect an effect of this variable for obligatory (O), rather than for non-obligatory (NO) items. And indeed: for the obligatory presence-of-policy items, a considerably higher coefficient for accession to institutions is found than for the non-obligatory ones (0.421 v. 0.272). However, the 'O' model lacks overall significance.

The low effect of EU variables, discussed above, is also reflected in the sub-group calculations. The only significant results are produced by EU accession for the presence of production process standards (PP). This should not come as a surprise as such: the EU has issued many of those standards over the years and new member states entering the EU are supposed to catch up with them. If one for a moment brackets the low overall significance of the relevant models, a similar effect becomes visible for EU membership and product standards (P), a traditional key area in the EU's internal market policy. Furthermore, a stronger EU effect could have been expected for obligatory (O) than for non-obligatory (NO) items. However, this is hardly reflected in the figures. What remains as a basic conclusion is the overall low effect of the EU compared to harmonisation by other international institutions and particularly transnational communication.

For some of the presence-of-policy sub-groups (NPP and NO; as well as for NPP settings items, but within an overall non-significant model), the negative coefficient for trade openness is replicated. Most of the findings regarding the impact of trade, however, turn out to be insignificant. Again, however, the bigger surprise is in what turns out to be not significant. According to hypothesis H 4.2, we would have expected clear and distinct effects of trade openness on product (P) and production process (PP) standards, but here no significant results are available whatsoever. If anything, this once more confirms the marginal impact of trade on delta-convergence, compared to institutional factors.

With regard to other variables, apart from single factors incidentally flashing up in overall non-significant models, no notable effects can be reported. This reflects the low impact of other factors when compared to the international ones, as observed above.

7.7 CONCLUSION

This chapter investigated the question of delta-convergence, i.e., convergence towards an exemplary model or benchmark, with the help of the gap approach. In this particular analysis, the benchmark was the strictest available policy option (SAPO) found in the entire country sample in each decade under consideration. If the gap between a concrete policy or an aggregated set of policies and the SAPO decreases, this can be interpreted as delta-convergence and, thus, as a 'race' – or at least a movement – 'to the top'.

Although of course our attempt to explain the dynamic within our sample with the help of several international and domestic variables constitutes the ultimate goal of the exercise, the mere description of how the policy gaps of the twenty-four countries in the ENVIPOLCON database developed over time also raises some interesting observations.

First, there can be no doubt that delta-convergence has occurred over the entire period. Building upon chapters 5 and 6, we can now firmly claim that policies of our twenty-four countries have not only moved towards each other over time (sigma-convergence), but that they also did so in an upward direction (delta-convergence). This holds both for the sheer presence of policies and for the strictness of policy standards. Second, the analysis shows that – across the board – the strongest reduction of the policy gap took place in the 1990s. This is in line with the findings of chapter 5.

The explanatory analysis in the final sections of this chapter was carried out by pooling our data for the three decades. The findings thus achieved confirm several of the ones produced by the pair approach in chapter 6, but also give rise to some important qualifications.

First, as far as the key explanatory factors of the ENVIPOLCON project are concerned, the findings of the present chapter strongly confirm the prevalence of international institutions over regulatory competition. An effect of trade openness on delta-convergence was virtually absent for settings and even negative for presence-of-policy. In contrast, institutional factors could account for policy gap change almost throughout our pooled models.

Second, looking at institutional factors in more detail, our findings suggest a remarkably strong effect of transnational communication on policy gap change, especially when compared to that of international harmonisation. As pointed out in the conclusions to chapter 6, an effect of transnational communication as such was certainly hypothesised (cf. hypothesis H 3.2 in the present chapter), but intuitively one would have expected it to be smaller than that caused by international harmonisation. This expectation is refuted by the present analysis. Whereas the pair approach already somewhat surprisingly showed both effects to be of about equal size, the effect of transnational communication found in the gap approach even surpasses that of international harmonisation, notably in relation to settings, i.e., the level of standards, environmental levies, etc. This observation suggests that 'soft' mechanisms such as international problem-solving in epistemic communities (Haas 1992), lesson-drawing, emulation and benchmarking are at least as important as (binding) international rules in bringing about policy change at the domestic level. Further research (including the second, qualitative part of the ENVIPOLCON project) is no doubt necessary to test the robustness of this finding and to better understand its background and implications. In particular, it could shed light on the question whether transnational communication alone is indeed sufficient to bring about the observed effect on convergence, or if it occurs rather in anticipation of rules. In the latter case, we would be dealing here mainly with a temporal effect, with transnational communication in international institutions basically considered by the participating countries as preceding international harmonisation. The fact that the effect appears so striking here might then be linked to the phenomenon that transnational communication does not necessarily take place in the same institution as the eventual harmonisation, e.g., OECD recommendations preceding EU legislation, but already sparks off activities at the national level.

Third, the present analysis confirms the conclusion drawn on the basis of the pair approach that the effect of EU accession and membership is considerably more limited than expected. Although this may be partly explained by a numerical factor (i.e., the fact that the EU, particularly in the beginning of the period under consideration, covers only a small part of the country sample, cf. chapter 6), it is also very much in line with the apparent prevalence of transnational communication over harmonisation as a driving force behind convergence. Whereas the EU is the only international institution setting fully binding and enforceable rules, it is one among many institutions (although certainly an important one) facilitating transnational communication.

Finally, it must be noted that the other variables in the analysis (GDP per capita, green parties, cultural openness, industrial CO_2 emissions and population density) hardly explain anything. With a few exceptions, their effect appears to be statistically not significant. Obviously, when compared to the pair approach, these variables have suffered most from the small number of observations, even with N elevated to 72. Thus, without allowing for any specific inferences on this point, the only conclusion that may be justified here is that the effect of domestic factors indeed appears to fall back behind that of international ones, most notably transnational communication.

References

Abbott, Kenneth W. and Duncan Snidal (1998) 'Why states act through formal international organizations', *Journal of Conflict Resolution*, 42:1, 3–32.

(2000) 'Hard and soft law in international governance', *International Organization*, 54:3, 421–56.

Abbott, Kenneth W., Robert O. Keohane, Andrew Moravcsik, Anne-Marie Slaughter and Duncan Snidal (2000) 'The concept of legalization', *International Organization*, 54:3, 401–19.

Alcalá, Francisco and Antonio Ciccone (2004) 'Trade and productivity', *Quarterly Journal of Economics*, 119:2, 613–46.

Alesina, Alberto and Romain Wacziarg (1998) 'Openness, country size and government', *Journal of Public Economics*, 69:3, 305–21.

Andersen, Michael S. and Duncan Liefferink (eds.) (1997) *European Environmental Policy. The Pioneers*. Manchester: Manchester University Press.

Armingeon, Klaus and Romana Careja (2004) *Comparative Data Set for 28 Post-Communist Countries, 1989–2004*. Bern: Institute of Political Science, University of Bern.

Armingeon, Klaus, Philipp Leimgruber, Michelle Beyeler and Sarah Menegale (2005) *Comparative Political Data Set, 1960–2003*. Bern: Institute of Political Science, University of Bern.

Badaracco, Joseph L. (1985) *Loading the Dice. A Five-Country Study of Vinyl Chloride Regulation*. Boston: Harvard Business School Press.

Barrios, Salvador, Holger Görg and Eric Strobl (2003) 'Multinational enterprises and new trade theory: evidence for the convergence hypothesis', *Open Economies Review*, 14:4, 397–418.

Baum, Joel A. C. and Christine Oliver (1992) 'Institutional embeddedness and the dynamics of organizational populations', *American Sociological Review*, 57:4, 540–59.

Baumgartner, Frank R. and Beth L. Leech (1996) 'Good theories deserve good data', *American Journal of Political Science*, 40:2, 565–9.

Beckerman, Wilfred (1992) 'Economic growth and the environment. Whose growth? Whose environment?', *World Development*, 20:4, 481–96.

Bennett, Colin J. (1988) 'Different processes, one result. The convergence of data protection policy in Europe and the United States', *Governance*, 1:4, 162–83.

(1991) 'What is policy convergence and what causes it?', *British Journal of Political Science*, 21:2, 215–33.

Bernauer, Thomas and Christoph Achini (2000) 'From "real" to "virtual" states? Integration of the world economy and its effects on government activity', *European Journal of International Relations*, 6:2, 223–76.

Bernauer, Thomas and Vally Koubi (2004) 'On the political determinants of environmental quality'. Paper presented at the Annual Meeting of the American Political Science Association, Chicago, 2–5 September.

Berry, Frances S. and William D. Berry (1990) 'State lottery adoptions as policy innovations: an event history analysis', *American Political Science Review*, 84:2, 395–415.

Bikhchandani, Sushil, David Hirshleifer and Ivo Welch (1992) 'A theory of fads, fashion, custom, and cultural change as information cascades', *Journal of Political Economy*, 100:5, 992–1026.

Binder, Manfred (2002) *Umweltpolitische Basisinnovationen im Industrieländervergleich. Ein grafisch-statistischer Überblick*, FFU-report 02–06. Berlin: Centre for Environmental Policy Research.

(2005) 'Umweltpolitische Basisinnovationen im Industrieländervergleich. Ein grafisch-statistischer Überblick', in Kerstin Tews and Martin Jänicke (eds.), *Die Diffusion umweltpolitischer Innovationen im internationalen System*. Wiesbaden: VS Verlag, 195–232.

Binder, Seth and Eric Neumayer (2005) 'Environmental pressure groups, strength and air pollution: an empirical analysis', *Ecological Economics*, 55:4, 527–38.

Bogdandy, Amin von (1999) *Supranationaler Föderalismus als Wirklichkeit und Idee einer Herrschaftsform. Zur Gestalt der Europäischen Union nach Amsterdam*. Baden-Baden: Nomos.

Botcheva, Liliana and Lisa L. Martin (2001) 'Institutional effects on state behavior: convergence and divergence', *International Studies Quarterly*, 45:1, 1–26.

Boyce, James K. (2004) 'Green and brown? Globalization and the environment', *Oxford Review of Economic Policy*, 20:1, 105–28.

Boyle, Gerry E. and Tom G. McCarthy (1999) 'Simple measures of convergence in per capita GDP: a note on some further international evidence', *Applied Economics Letters*, 6:6, 343–7.

Braun, Dietmar and Fabrizio Gilardi (2006) 'Taking Galton's problem seriously. Towards a theory of policy diffusion', *Journal of Theoretical Politics*, 18:3, 298–322.

Bremer, Stuart A. (1992) 'Dangerous dyads: conditions affecting the likelihood of interstate war, 1816–1965', *Journal of Conflict Resolution*, 36:2, 309–41.

Brickman, Ronald, Sheila Jasanoff and Thomas Ilgen (1985) *Controlling Chemicals. The Politics of Regulation in Europe and the United States*. Ithaca: Cornell University Press.

Brune, Nancy and Geoffrey Garrett (2000) 'The diffusion of privatization in the developing world'. Paper presented at the Annual Meeting of the American Political Science Association, Washington D.C., 30 August–3 September.

Burke, B. (1999) 'Diffusion of regulatory and distributive innovations across the American states. Different paths?' Paper presented at the Annual Meeting of the American Political Science Association, Atlanta, 2–5 September.

Busch, Per-Olof and Helge Jörgens (2005a) 'International patterns of environmental policy change and convergence', *European Environment*, 15:2, 80–101.

(2005b) 'Globale Ausbreitungsmuster umweltpolitischer Institutionen', in Kerstin Tews and Martin Jänicke (eds.), *Die Diffusion umweltpolitischer Innovationen im internationalen System*. Wiesbaden: VS Verlag, 55–194.

(2005c) 'The international sources of policy convergence: explaining the spread of environmental policy innovations', *Journal of European Public Policy*, 12:5, 860–84.

Busch, Per-Olof, Helge Jörgens and Kerstin Tews (2005) 'The global diffusion of regulatory instruments: the making of a new international environmental regime', *The Annals of the American Academy of Political and Social Science*, 598:1, 146–67.

Castles, Frank G. and Peter Mair (1984) 'Left–right political scales: some "expert" judgments', *European Journal of Political Research*, 12:1, 73–88.

Cowles, Maria G., James A. Caporaso and Thomas Risse (eds.) (2001) *Transforming Europe. Europeanisation and Domestic Change*. Ithaca: Cornell University Press.

Crepaz, Markus M. L. (1995) 'Explaining national variations of air pollution levels: political institutions and their impact on environmental policy-making', *Environmental Politics*, 4:3, 391–414.

Daley, Dorothy M. and James C. Garand (2005) 'Horizontal diffusion, vertical diffusion, and internal pressure in state environmental policymaking', *American Politics Research*, 33:5, 615–44.

DiMaggio, Paul J. and Walter W. Powell (1991) 'The iron cage revisited. Institutionalized isomorphism and collective rationality in organizational fields', in Walter W. Powell and Paul J. DiMaggio (eds.), *The New Institutionalism in Organizational Analysis*. Chicago: Chicago University Press, 63–82.

Dimitrova, Antoaneta and Bernard Steunenberg (2000) 'The search for convergence of national policies in the European Union. An impossible quest?', *European Union Politics*, 1:2, 201–26.

Dobbin, Frank, Geoffrey Garrett and Beth Simmons (2003) 'The international diffusion of democracy and markets'. Paper presented at the conference 'Interdependence, Diffusion and Sovereignty', UCLA, 7–8 March.

Dollar, David (1992) 'Outward-oriented developing countries really do grow more rapidly: evidence from 95 LDC's 1976–85', *Economic Development and Cultural Change*, 40:3, 523–44.

Dolowitz, David P. and David Marsh (1996) 'Who learns what from whom? A review of the policy transfer literature', *Political Studies*, 44:3, 343–57.

(2000) 'Learning from abroad: the role of policy transfer in contemporary policy making', *Governance*, 13:1, 5–24.

Dowrick, Steve and Jane Golley (2004) 'Trade openness and growth: who benefits?', *Oxford Review of Economic Policy*, 20:1, 38–56.

Drezner, Daniel W. (2001) 'Globalization and policy convergence', *International Studies Review*, 3:1, 53–78.

Elkins, Zachary and Beth Simmons (2005) 'On waves, clusters, and diffusion: a conceptual framework', *The Annals of the American Academy of Political and Social Science*, 598:1, 33–51.

Eyestone, Robert (1977) 'Confusion, diffusion and innovation', *American Political Science Review*, 71:2, 441–7.

Finnemore, Martha (1996) *National Interests in International Society*. Ithaca: Cornell University Press.

Fisher, Dana R. and William R. Freudenburg (2004) 'Postindustrialization and environmental quality: an empirical analysis of the environmental states', *Social Forces*, 83:1, 157–88.

Frank, David J., Ann Hironaka and Evan Schofer (2000) 'The nation-state and the natural environment over the twentieth century', *American Sociological Review*, 65:1, 96–116.

Frankfort-Nachmias, Chava and David Nachmias (1996) *Research Methods in the Social Sciences*. London: Arnold.

Fredriksson, Per G. and Daniel L. Millimet (2004) 'Comparative politics and environmental taxation', *Journal of Environmental Economics and Management*, 48:1, 705–22.

Fredriksson, Per G., Eric Neumayer, Richard Damania and Scott Gates (2005) 'Environmentalism, democracy and pollution control', *Journal of Environmental Economics and Management*, 49:2, 343–65.

Fridtjof Nansen Institute (FNI) since 1992 (until 1997 as *Green Globe Yearbook*), *Yearbook of International Cooperation on Environment and Development*. London: Earthscan. See also: http://www.greenyearbook.org/.

Friedkin, Noah E. (1993) 'Structural bases of interpersonal influence in groups. A longitudinal case study', *American Sociological Review*, 58:6, 861–72.

Garrett, Geoffrey and Deborah Mitchell (2001) 'Globalization, government spending and taxation in the OECD', *European Journal of Political Research*, 39:2, 145–77.

Gilardi, Fabrizio (2005) 'The institutional foundations of regulatory capitalism: the diffusion of independent regulatory agencies in Western Europe', *The Annals of the American Academy of Political and Social Science*, 598:1, 84–101.

Gilardi, Fabrizio and Dietmar Braun (2005) 'Taking "Galton's Problem" seriously: towards a theory of policy diffusion'. Paper presented at the Convention of the International Studies Association, Honolulu, 1–5 March.

Gourevitch, Peter (2002) 'Domestic politics and international relations', in W. Carlsnaes, T. Risse and B. A. Simmons (eds.), *Handbook of International Relations*. London: Sage, 309–28.

Graesser, Art, Katja Wiemer-Hastings, Peter Wiemer-Hastings and Roger Kreuz (2000) 'The gold standard of question quality on surveys: experts, computer tools, versus statistical indices', *Proceedings of the Section on Survey Research Methods of the American Statistical Association*, 459–64.

Gray, Virginia (1973) 'Innovation in the states: a diffusion study', *American Political Science Review*, 67:4, 1174–85.

Guillén, Mauro F. (2001) 'Is globalization civilizing, destructive or feeble? A critique of five key debates in the social science literature', *Annual Review of Sociology*, 27, 235–60.

Haas, Peter M. (1992) 'Introduction: epistemic communities and international policy coordination', *International Organization*, 46:1, 1–36.

Hall, Peter A. (1993) 'Policy paradigms, social learning and the state. The case of economic policymaking in Britain', *Comparative Politics*, 25:3, 275–96.

Hallerberg, Mark and Scott Basinger (1998) 'Internationalization and changes in tax policy in OECD countries', *Comparative Political Studies*, 31:3, 321–52.

Heichel, Stephan, Jessica Pape and Thomas Sommerer (2005) 'Is there convergence in convergence research? An overview of empirical studies on policy convergence', *Journal of European Public Policy*, 12:5, 817–40.

Heidenheimer, Arnold J., Hugh Heclo and Carolyn T. Adams (1990) *Comparative Public Policy. The Politics of Social Choice in America, Europe, and Japan*. New York: St. Martin's Press.

Héritier, Adrienne and Christoph Knill (2001) 'Differential responses to European policies: a comparison', in Adrienne Héritier, Dieter Kerwer, Christoph Knill, Dirk Lehmkuhl, Michael Teutsch and Anne-Cécile Douillet (eds.), *Differential Europe. The European Union Impact on National Policymaking*. Lanham: Rowman and Littlefield, 257–94.

Héritier, Adrienne, Christoph Knill and Susanne Mingers (1996) *Ringing the Changes in Europe. Regulatory Competition and the Transformation of the State*. Berlin: De Gruyter.

Héritier, Adrienne, Dieter Kerwer, Christoph Knill, Dirk Lehmkuhl, Michael Teutsch and Anne-Cécile Douillet (eds.) (2001) *Differential Europe. The European Union Impact on National Policymaking*. Lanham: Rowman and Littlefield.

Hewitt, Joseph (2003) 'Dyadic processes and international crisis', *Journal of Conflict Resolution*, 47:5, 669–92.

Hironaka, Ann (2002) 'The globalization of environmental protection: the case of environmental impact assessment', *International Journal of Comparative Sociology*, 43:1, 65–78.

Hoberg, George (1991) 'Sleeping with an elephant: the American influence on Canadian environmental regulation', *Journal of Public Policy*, 11:1, 107–31.

(2001) 'Globalization and policy convergence: symposium overview', *Journal of Comparative Policy Analysis: Research and Practice*, 3:2, 127–32.

Hoberg, George, Keith Banting and Richard Simeon (1999) 'North American integration and the scope for domestic choice: Canada and policy sovereignty in a globalized world'. Paper presented at the Annual Meeting of the Canadian Political Science Association, Sherbrooke, Quebec, 6–8 June.

Holzer, Thomas and Gerald Schneider (2002) *Asylpolitik auf Abwegen. Nationalstaatliche und europäische Reaktionen auf die Globalisierung der Flüchtlingsströme*. Opladen: Leske und Budrich.

Holzinger, Katharina (1994) *Politik des kleinsten gemeinsamen Nenners. Umweltpolitische Entscheidungsprozesse in der EG am Beispiel des Katalysatorautos*. Berlin: Edition Sigma.

(2002) 'The provision of transnational common goods: regulatory competition for environmental standards', in Adrienne Héritier (ed.), *Common Goods: Reinventing European and International Governance*. Lanham: Rowman and Littlefield, 59–82.

(2003) 'Common goods, matrix games, and institutional solutions', *European Journal of International Relations*, 9:2, 173–212.

Holzinger, Katharina and Christoph Knill (2004) 'Regulatory competition and regulatory cooperation in environmental policy: individual and interaction effects', *Journal of Public Policy*, 24:1, 25–47.

(2005a) *Competition, Cooperation and Communication. A Theoretical Analysis of Different Sources of Environmental Policy Convergence and their Interaction*. Working Paper, Political Science Series 102. Vienna: Institute for Advanced Studies.

(2005b) 'Causes and conditions of cross-national policy convergence', *Journal of European Public Policy*, 12:5, 775–96.

Holzinger, Katharina, Christoph Knill and Ansgar Schäfer (2003) 'Steuerungswandel in der europäischen Umweltpolitik?', in Katharina Holzinger, Christoph Knill and Dirk Lehmkuhl (eds.), *Bedingungen und Muster politischer Steuerung im historischen Vergleich*. Opladen: Leske und Budrich, 57–85.

Howlett, Michael (2000) 'Beyond legalism? Policy ideas, implementation styles and emulation-based convergence in Canadian and US environmental policy', *Journal of Public Policy*, 20:3, 305–29.

Huber, John D. and Ronald Inglehart (1995) 'Expert interpretations of party space and party locations in 42 societies', *Party Politics* 1:1, 73–111.

Humphreys, Peter (2002) 'Europeanisation, globalisation and telecommunications governance: a neo-Gramscian analysis', *Convergence: The Journal of Research into New Media Technologies*, 8:2, 52–79.

Jahn, Detlef (1998) 'Environmental performance and policy regimes: explaining variations in 18 OECD countries', *Policy Sciences*, 31:2, 107–31.

(2000) 'Patterns and correlates of environmental politics in the Western democracies', in Stephen C. Young (ed.), *The Emergence of Ecological Modernization. Integrating the Environment and the Economy?* London and New York: Routledge, 153–70.

Jänicke, Martin (1992) 'Conditions for environmental policy success: an international comparison', *The Environmentalist*, 12:1, 47–58.

(1996) 'Erfolgsbedingungen von Umweltpolitik', in Martin Jänicke (ed.), *Umweltpolitik der Industrieländer. Entwicklung – Bilanz – Erfolgsbedingungen*. Berlin: Edition Sigma, 9–28.

(1998) 'Umweltpolitik. Global am Ende oder am Ende global?', in Ulrich Beck (ed.), *Perspektiven der Weltgesellschaft*. Frankfurt a. M.: Suhrkamp, 332–44.

Jänicke, Martin and Helge Jörgens (1998) 'National environmental policy planning in OECD countries: preliminary lessons from cross-national comparisons', *Environmental Politics*, 7:2, 27–54.

Jänicke, Martin and Helmut Weidner (eds.) (1997) *National Environmental Policies. A Comparative Study of Capacity-Building*. Berlin, Heidelberg and New York: Springer.

Jordan, Andrew and Duncan Liefferink (eds.) (2004) *Environmental Policy in Europe. The Europeanisation of National Environmental Policy*. London: Routledge.

Jordan, Andrew and Duncan Liefferink (2005) 'An "ever closer union" of national policy? The convergence of national environmental policy in the European Union', *European Environment*, 15:2, 102–13.

Jordan, Andrew, Rüdiger Wurzel and Anthony R. Zito (2000) 'Innovating with "new" environmental policy instruments: convergence or divergence in the European Union?' Paper presented at the Annual Meeting of the American Political Science Association, Washington, D.C., 31 August–3 September.

(2003) 'New instruments of environmental governance', *Environmental Politics*, 12:1, 1–224.

Jordan, Andrew, Rüdiger Wurzel, Anthony R. Zito and Lars Brückner (2002) 'The innovation and diffusion of "new" environmental policy instruments (NEPIs) in the European Union and its member states', in Frank Biermann, Rainer Brohm and Klaus Dingwerth (eds.), *Proceedings of the 2001 Berlin Conference on the Human Dimensions of Global Environmental Change 'Global Environmental Change and the Nation State'*. Potsdam: Potsdam Institute for Climate Impact Research, 151–60.

Jordana, Jacint and David Levi-Faur (2005) 'The diffusion of regulatory capitalism in Latin America: sectoral and national channels in the making of a new order', *The Annals of the American Academy of Political and Social Science*, 598:1, 102–24.

Jörgens, Helge (1996) 'Die Institutionalisierung von Umweltpolitik im internationalen Vergleich', in Martin Jänicke (ed.), *Umweltpolitik der Industrieländer. Entwicklung – Bilanz – Erfolgsbedingungen*. Berlin: Edition Sigma, 95–111.

(2004) 'Governance by diffusion – implementing global norms through cross-national imitation and learning', in William M. Lafferty (ed.), *Governance for Sustainable Development. The Challenge of Adapting Form to Function*. Cheltenham: Edward Elgar, 246–83.

Keck, Margaret E. and Kathryn Sikkink (1998) *Activists Beyond Borders. Advocacy Networks in International Politics*. Ithaca: Cornell University Press.

Kennedy, P. (2003) *A Guide to Econometrics*. Oxford: Blackwell Publishers.

Kern, Kristine (2000) *Die Diffusion von Politikinnovationen. Umweltpolitische Innovationen im Mehrebenensystem der USA*. Opladen: Leske und Budrich.

Kern, Kristine, Helge Jörgens and Martin Jänicke (2000) 'Die Diffusion umweltpolitischer Innovationen. Ein Beitrag zur Globalisierung von Umweltpolitik', *Zeitschrift für Umweltpolitik und Umweltrecht*, 23:4, 507–46.

(2001) 'The diffusion of environmental policy innovations: a contribution to the globalisation of environmental policy', Discussion Paper FS II 01–302, Berlin: WZB.

Kerr, Clark (1983) *The Future of Industrial Societies. Convergence or Continuing Diversity?* Cambridge: Cambridge University Press.

King, Ron F. and Alexandra Borchardt (1994) 'Red and green: air pollution levels and left party power in OECD countries', *Environment and Planning C: Government and Policy*, 12:22, 225–41.

Kinsella, David and Bruce Russett (2002) 'Conflict emergence and escalation in interactive international dyads', *Journal of Politics*, 64:4, 1045–68.

Kitschelt, Herbert (1983) *Politik und Energie. Energie-Technologiepolitiken in den USA, der Bundesrepublik Deutschland, Frankreich und Schweden*. Frankfurt a. M. and New York: Campus.

Knill, Christoph (2001) *The Europeanisation of National Administrations. Patterns of Institutional Change and Persistence*. Cambridge: Cambridge University Press.

(2003) *Europäische Umweltpolitik. Steuerungsprobleme und Regulierungsmuster im Mehrebenensystem*. Opladen: Leske und Budrich.

(2005) 'Introduction. Cross-national policy convergence: concepts, approaches and explanatory factors', *Journal of European Public Policy*, 12:5, 764–74.

Knill, Christoph and Andrea Lenschow (2005) 'Compliance, communication and competition: patterns of EU environmental policy making and their impact on policy convergence', *European Environment*, 15:2, 114–28.

Knoepfel, Peter, Lennart J. Lundqvist, Rémy Prud'homme and Peter Wagner (1987) 'Comparing environmental policies: different styles, similar content', in Meinolf Dierkes, Hans N. Weiler and Ariane Berthoin Antal (eds.), *Comparative Policy Research. Learning from Experience*. Aldershot: Gower, 171–87.

Knutsen, Oddbjørn (1998) 'Expert judgement of the left–right location of political parties: a comparative longitudinal study', *West European Politics* 21:2, 63–94.

Korpi, Walter and Joakim Palme (2003) 'New politics and class politics in the context of austerity and globalization: welfare state regress in 18 countries, 1975–95', *American Political Science Review*, 97:3, 435–46.

Kraemer, A. (1991) 'Muddy waters at the OECD: the data on water management', FFU-report 1991/1. Unpublished manuscript, University of Berlin, Centre for Environmental Studies.

Laver, Michael and Ben Hunt (1992) *Policy and Party Competition*. London: Routledge.

Lavigne, Marie (1999) *The Economics of Transition. From Socialist Economy to Market Economy*. Basingstoke: Macmillan.

Lawson, Chappell H. (2004) 'Fox's Mexico at midterm', *Journal of Democracy*, 15:1, 139–53.

Lenschow, Andrea, Duncan Liefferink and Sietske Veenman (2005) 'When the birds sing. A framework for analysing domestic factors behind policy convergence', *Journal of European Public Policy*, 12:5, 797–816.

Levi-Faur, David (2002) 'Herding towards a new convention. On herds, shepherds and lost sheep in the liberalization of the telecommunications and electricity industries'. Paper presented at the workshop 'Theories of Regulation', Nuffield College, University of Oxford, 25–26 May.

(2005) 'The global diffusion of regulatory capitalism', *The Annals of the American Academy of Political and Social Science*, 598:1, 12–32.

Li, Quan and Rafael Reuveny (2003) 'Economic globalization and democracy: an empirical analysis', *British Journal of Political Science*, 33:1, 29–54.

Liefferink, Duncan (1999) 'The Dutch national plan for sustainable society', in Norman J. Vig and Regina S. Axelrod (eds.), *The Global Environment. Institutions, Law and Policy*. Washington, D.C.: CQ Press, 256–78.

Lundqvist, Lennart J. (1974) 'Do political structures matter in environmental politics? The case of air pollution control in Canada, Sweden, and the United States', *Canadian Public Administration*, 17:1, 119–41.

(1980) *The Hare and the Tortoise. Clean Air Policies in the United States and Sweden*. Ann Arbor: University of Michigan Press.

Marcussen, Martin (2005) 'Central banks on the move', *Journal of European Public Policy*, 12:5, 903–23.

Martin, Lisa L. and Beth A. Simmons (1998) 'Theories and empirical studies of international institutions', *International Organization*, 52:4, 729–57.

Meseguer Yebra, Covadonga (2003) *Learning and Economic Policy Choices. A Bayesian Approach*. EUI Working Paper RSC No. 2003/5. San Domenico: European University Institute.

(2005) 'Policy learning, policy diffusion, and the making of a new order', *The Annals of the American Academy of Political and Social Science*, 598:1, 67–82.

Meyer, John W. and Brian Rowan (1977) 'Institutionalized organizations. Formal structure as myth and ceremony', *American Journal of Sociology*, 83:2, 340–63.

Meyer, John W., David J. Frank, Ann Hironaka, Evan Schofer and Nancy Brandon-Tuma (1997) 'The structuring of a world environmental regime, 1870–1990', *International Organization*, 51:4, 623–51.

Midlarsky, Manus I. (1998) 'Democracy and the environment: an empirical assessment', *Journal of Peace Research*, 35:3, 341–61.

Mintrom, Michael (1997) 'The state–local nexus in policy innovation diffusion: the case of school choice', *Publius – The Journal of Federalism*, 27:3, 41–59.

Mintrom, Michael and Sandra Vergari (1998) 'Policy networks and innovation diffusion: the case of state education reforms', *Journal of Politics*, 60:1, 126–48.

Müller-Rommel, Ferdinand (2002) 'The lifespan and the political performance of green parties in Western Europe', in Ferdinand Müller-Rommel and Thomas Poguntke (eds.), *Green Parties in National Governments*. London: Frank Cass, 1–16.

Murdoch, James C. and Todd Sandler (1997) 'The voluntary provision of a pure public good: the case of reduced CFC emissions and the Montreal Protocol', *Journal of Public Economics*, 63:3, 331–49.

Murdoch, James C., Todd Sandler and Keith Sargent (1997) 'A tale of two collectives: sulphur versus nitrogen oxides emission reduction in Europe', *Economica*, 64:254, 281–301.

Neumayer, Eric (2001) 'Improvements without convergence: pressure on the environment in EU countries', *Journal of Common Market Studies*, 39:5, 927–37.

(2003) 'Are left-wing strength and corporatism good for the environment? Evidence from panel analysis of air pollution in OECD countries', *Ecological Economics*, 45:2, 203–20.

Neyer, Jürgen (1999) 'Legitimes Recht oberhalb des demokratischen Rechtsstaates? Supranationalität als Herausforderung für die Politikwissenschaft', *Politische Vierteljahresschrift*, 40:3, 390–414.

OECD (no year) *International Trade by Commodities Statistics* (*ITCS*), CD-ROM. Paris: OECD.

OECD (various years) *Environmental Data Compendium*. Paris: OECD.

Panayotou, Theodore (1993) *Empirical Tests and Policy Analysis of Environmental Degradation at Different Stages of Economic Development*. ILO Technology and Employment Programme Working Paper, WP 238. Geneva: ILO.

Potoski, Matthew (2001) 'Environmental clean air federalism: do states race to the bottom?', *Public Administration Review*, 61:3, 335–42.

Presser, Stanley (2004) 'Methods for testing and evaluating survey questions', *Public Opinion Quarterly*, 68:1, 109–30.

Radaelli, Claudio M. (2000) 'Policy transfer in the European Union: institutional isomorphism as a source of legitimacy', *Governance*, 13:1, 25–43.

(2005) 'Diffusion without convergence: how political context shapes the adoption of regulatory impact assessment', *Journal of European Public Policy*, 12:5, 924–43.

Ray, Leonard (1999) 'Measuring party orientations towards European integration: results from an expert survey', *European Journal of Political Research*, 36:6, 283–306.

Ricken, Christian (1995) 'Nationaler Politikstil, Netzwerkstrukturen sowie ökonomischer Entwicklungsstand als Determinanten einer effektiven Umweltpolitik: Ein empirischer Industrieländervergleich', *Zeitschrift für Umweltpolitik und Umweltrecht*, 18:4, 481–501.

(1997) *Determinanten der Effektivität der Umweltpolitik. Der nationale Politikstil im Spannungsfeld von Ökonomie, Politik und Kultur*. Frankfurt a. M.: Peter Lang.

Ringquist, Evan J. and Tatiana Kostadinova (2005) 'Assessing the effectiveness of international environmental agreements: the case of the 1985 Helsinki Protocol', *American Journal of Political Science*, 49:1, 86–102.

Rodrik, Dani, Arvind Subramanian and Francesco Trebbi (2002) *Institutions Rule. The Primacy of Institutions over Integration and Geography in Economic Development*. IMF Working Paper, 02/189.

Rogers, Everett M. (2003) *Diffusion of Innovations*. Fifth edition. New York: Free Press.

Rose, Richard (1991) 'What is lesson-drawing?', *Journal of Public Policy*, 11:3, 3–30.

(1993) *Lesson-Drawing in Public Policy. A Guide to Learning Across Time and Space*. Chatham: Chatham House.

Rudra, Nita (2004) 'Openness, welfare spending, and inequality in the developing world', *International Studies Quarterly*, 48:3, 683–709.

Sala-i-Martin, Xavier X. (1996) 'Regional cohesion: evidence and theories of regional growth and convergence', *European Economic Review*, 40:6, 1325–52.

Scharpf, Fritz W. (1997) 'Introduction. The problem-solving capacity of multi-level governance', *Journal of European Public Policy*, 4:4, 520–38.

Schimmelfennig, Frank and Ulrich Sedelmeier (2004) 'Governance by conditionality: EU rule transfer to the candidate countries of Central and Eastern Europe', *Journal of European Public Policy*, 11:4, 661–79.

Scruggs, Lyle (1999) 'Institutions and environmental performance in seventeen Western democracies', *British Journal of Political Science*, 29:1, 1–31.

(2001) 'Is there really a link between neo-corporatism and environmental performance? Updated evidence and new data for the 1980s and 1990s', *British Journal of Political Science*, 31:4, 686–92.

(2003) *Sustaining Abundance. Environmental Performance in Industrial Democracies*. Cambridge: Cambridge University Press.

Seeliger, Robert (1996) 'Conceptualizing and researching policy convergence', *Policy Studies Journal*, 24:2, 287–306.

Shandra, John M., Bruce London, Owen P. Whooley and John B. Williamson (2004) 'International nongovernmental organizations and carbon dioxide emissions in the developing world: a quantitative, cross-national analysis', *Sociological Inquiry*, 74:4, 520–45.

Simmons, Beth A. and Zachary Elkins (2004) 'The globalization of liberalization: policy diffusion in the international political economy', *American Political Science Review*, 98:1, 171–89.

Stern, David I. and Michael S. Common (2001) 'Is there an environmental Kuznets curve for sulfur?', *Journal of Environmental Economics and Management*, 41:2, 162–78.

Strang, David and John W. Meyer (1993) 'Institutional conditions for diffusion', *Theory and Society*, 22:4, 487–511.

Syrquin, Moshe (1988) 'Patterns of structural change', in Hollis Chenery and T. N. Srinivasan (eds.), *Handbook of Development Economics*. Amsterdam: North-Holland, 203–73.

Tews, Kerstin (2002) 'Politiktransfer: Phänomen zwischen Policy-Lernen und Oktroi. Überlegungen zu unfreiwilligen Umweltpolitikimporten am Beispiel der EU-Osterweiterung', *Zeitschrift für Umweltpolitik und Umweltrecht*, 25:2, 173–201.

(2005a) 'Die Diffusion umweltpolitischer Innovationen: Eckpunkte eines Analysemodells', in Kerstin Tews and Martin Jänicke (eds.), *Die Diffusion umweltpolitischer Innovationen im internationalen System*. Wiesbaden: VS Verlag, 25–54.

(2005b) 'The diffusion of environmental policy innovations. Cornerstones of an analytical framework', *European Environment*, 15:2, 63–79.

Tews, Kerstin, Per-Olof Busch and Helge Jörgens (2003) 'The diffusion of new environmental policy instruments', *European Journal of Political Research*, 42:3, 569–600.

Tsebelis, George (2002) *Veto Players. How Political Institutions Work*. Princeton: Princeton University Press.

Unger, Brigitte and Frans van Waarden (1995) 'Introduction: an interdisciplinary approach to convergence', in Brigitte Unger and Frans van Waarden (eds.), *Convergence or Diversity? Internationalization and Economic Policy Response*. Aldershot: Avebury, 1–35.

Vogel, David (1986) *National Styles of Regulation. Environmental Policy in Great Britain and the United States*. Ithaca: Cornell University Press.

(1995) *Trading Up: Consumer and Environmental Regulation in the Global Economy*. Cambridge, MA: Harvard University Press.

(1997) 'Trading up and governing across: transnational governance and environmental protection', *Journal of European Public Policy*, 4:4, 556–71.

(2002) 'The Protestant ethic and the spirit of environmentalism: exploring the cultural roots of contemporary green politics', *Zeitschrift für Umweltpolitik und Umweltrecht*, 25:3, 297–322.

(2003) 'The hare and the tortoise revisited: the new politics of consumer and environmental regulation in Europe', *British Journal of Political Science*, 33:4, 557–80.

Walker, Jack L. (1969) 'The diffusion of innovations among the American states', *American Political Science Review*, 63:3, 880–99.

Wallace, David (1995) *Environmental Policy and Industrial Innovation. Strategies in Europe, the US and Japan*. London: Earthscan.

Weidner, Helmut (2002) 'Capacity-building for ecological modernization: lessons from cross-national research', *American Behavioral Scientist*, 45:9, 1340–68.

Weidner, Helmut and Martin Jänicke (eds.) (2002) *Capacity Building in National Environmental Policy. A Comparative Study of 17 Countries*. Berlin, Heidelberg and New York: Springer.

World Bank (2002) *World Development Indicators*. Washington, D.C.: World Bank (CD-ROM).

Zürn, Michael (2000) 'Democratic governance beyond the nation-state: the EU and other international institutions', *European Journal of International Relations*, 6:2, 183–221.

Zürn, Michael and Christian Joerges (eds.) (2005) *Law and Governance in Postnational Europe*. Cambridge: Cambridge University Press.