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Implementing Multilateral Environmental Agreements: An Analysis of EU Directives

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Implementing Multilateral Environmental Agreements: An Analysis of EU Directives

While a number of different theoretical models have been advanced to explain why states implement, or indeed, do not implement, multilateral environmental agreements (MEAs), very little empirical work has been undertaken to validate their predications. With a view to narrowing this gap, the present paper adopts a large-N, econometric approach to test the explanatory power of four distinct models of compliance – domestic adjustment, reputational, constructivist and managerial – in the context of European Union (EU) environmental policy. Using data on the number of official infringements received by 15 member states for non-implementation of environmental directives over the period 1979-2000, we find that all four models contribute statistically significantly to explaining spatio-temporal differences in legal implementation. Thus, our results suggest that the implementation of MEAs is shaped by a combination of rational calculations of domestic compliance costs and reputational damage, domestically institutionalized normative obligations, and legal and political constraints. We conclude by suggesting a greater need for multi-causal theoretical models of supranational legal compliance.
Introduction

The past three decades have witnessed the rapid proliferation of multilateral environmental agreements (MEAs). Indeed, judged by the number of MEAs, the period since the Second World War has been a spectacular success for proponents of multilateralism. Less successful, however, has been the implementation of these agreements. While many governments have been willing to join MEAs, evidence suggests that they have not always fully honoured their legal obligations to put supranational commitments into practice, i.e., by incorporating treaties into domestic law, promulgating regulations, and establishing an adequate monitoring and enforcement infrastructure. The result has been a complex geography of legal compliance, characterised by spatial and temporal variations in the implementation of multilateral environmental policies.

Such variations have not escaped the attention of academics who have advanced a number of theoretical models to explain why states comply, or indeed, fail to comply, with their legal obligations to implement MEAs. Most relevant in the present context are what are broadly termed the domestic adjustment, reputational, constructivist and managerial models. Within the literature, each of these theoretical models (or approaches) is advanced as providing a distinctive account of variations in states (non-)compliance with multilateral legal obligations. In reality, however, many scholars

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1 Mitchell 2003
2 Faure and Lefevre 2005; Hønneland and Jørgensen 2003; Raustiala 2001; Sands 2003; Weiss and Jacobson 1998
3 In the present paper, we use the terms legal compliance and implementation interchangeably
accept that they are not necessarily mutually exclusive. Rather, as argued in the literature, different models focus on different aspects of non-compliant behaviour, and therefore should be seen as potentially complimentary.

Yet, despite no shortage of theoretical debate, very little empirical work has been undertaken to evaluate whether all four models contribute statistically significantly to explaining variations in the implementation of MEAs. To be sure, existing research has found evidence compatible with elements of each model. Consistent with the domestic adjustment model, empirical studies have identified high economic compliance costs as a major factor impeding states’ implementation of MEAs. Similarly, past work has found that reputational concerns have underpinned countries’ efforts to faithfully implement multilateral environmental commitments. Empirical support for the constructivist perspective, which emphasises the role of socialization, learning and norms in fostering implementation of MEAs, has proved more elusive. Yet the influence of normative factors has been documented in other contexts. Finally, confirming managerial expectations, past work has identified an important role for administrative capacity and/or quality in determining states’ ability to comply with MEAs.

Based on different policies, methodologies and samples, however, it is difficult to draw comparable conclusions from these studies. While individually finding evidence for one or the other model, this hardly constitutes conclusive evidence that all four models

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4 Beach 2005; Cardenas 2004; Knill 2001; Raustiala and Slaughter 2002; Simmons 1998
5 See Underdal 1998
6 Downs and Jones 2002; Neumayer 2001a; Underdal 1998
7 Weiss and Jacobson 1998
8 Economy 2004; Gupta 2001
9 Comisso et al. 1998; Zhao 2005
10 Beach 2005; Checkel 2001; Gulbrandsen 2003; Solomon 2006
are important determinants. Indeed, without controlling for the influence of other
determinants, simply focusing on the relationship between implementation and individual
explanatory models runs the risk of generating spurious results\textsuperscript{12}.

We seek to overcome these shortcomings by including several variables –
representing different theoretical approaches to explaining (non-)compliance with legal
obligations – within a single econometric model. Our multivariate research design allows
us to determine whether all four models are statistically robust predictors of
implementation of MEAs. For example, it is quite possible that variables capturing
predictions from managerial models might lose their explanatory power once variables
associated with domestic adjustment, reputational and constructivist approaches are taken
into account. Importantly, our multivariate, statistical approach also allows us to evaluate
whether each explanatory approach adds in a statistically significant way to the overall
explanatory power of the model.

Our empirical focus is the implementation of European Union (EU)
environmental directives. Although originally a predominantly economic agreement, the
EU has gone on to develop a large number of environmental laws. We use quantitative
techniques to evaluate the influence of ten hypothesised variables – chosen to examine
models of legal compliance – on the number of legal infringements received by 15 EU
states\textsuperscript{13} for non-implementation of environmental directives. Testing theoretical models
through the development and statistical analysis of hypotheses is a widely deployed
approach in the social sciences. In the present context, it involves specifying independent
variables believed to explain variations in state behaviour (i.e., the dependent variable),

\textsuperscript{12} Mitchell 2002
\textsuperscript{13} The 15 members of the EU prior to the accession of 10 new states in May 2004
derived respectively from different causal models. The explanatory power of the independent variables can subsequently be examined using various econometric estimation techniques.

Quantitative approaches have been used in past studies to investigate the determinants of policy implementation within the EU, although none of these works has specifically examined environment-related directives. Outside the EU, only a handful of studies have applied statistical techniques to understand the conditions facilitating and/or impeding the domestic implementation of MEAs. Instead, the majority of studies – whether focused on EU environmental directives or other regional and/or international environmental agreements – have taken the form of qualitative case-studies, typically involving a small number of countries, policies and/or regimes.

Yet a large-N quantitative approach offers considerable advantages in the present context. Econometric estimation techniques allow us to investigate large numbers of cases, comprising multiple years, states and environmental policies. They therefore yield insights which are potentially more generalisable than small-N qualitative studies. This is of particular advantage in testing theoretical models of compliance where we are interested in clarifying whether specific causal relationships hold across a range of contexts. Inevitably, there are trade-offs in our approach, not least because of the limited availability of data. We cannot measure several institutional variables identified in the literature as potential correlates of MEA implementation and, furthermore, are

14 Young 2004
15 Giuliani 2003; Lampinen and Uusikylä 1998; Mbaye 2001; Perkins and Neumayer 2007; Zürn and Joerges 2005
16 Miles et al. (1998) undertake cross-national statistical analyses of MEAs, although their focus is largely on effectiveness, rather than legal implementation
17 Börzel 2003; Bursens 2002; Knill 2001; Wilson et al. 1999
18 Haas 2000; Sprinz 2004
19 Mitchell 2006
forced to rely on several proxies which provide an imperfect measure of underlying mechanisms\textsuperscript{20}. Inevitably, these factors restrict our analysis, meaning that our results should only be read as indicative. Still, we believe that our quantitative approach makes a useful contribution to current understanding. Indeed, to our knowledge, our study is the first to use econometric techniques to explicitly investigate all four compliance theories – domestic adjustment, reputational, constructivist and managerial – within a single estimation model.

The rest of our paper is structured as follows. The nature, enforcement and scale of member state implementation is outlined in section 2. Section 3 briefly describes four widely-discussed theoretical explanations for variations in (non-)compliance with supranational legal commitments and advances a number of hypothesised variables used to capture each of these approaches. Section 4 outlines our variables and estimation model. Results are presented in Section 5. Briefly, we find that all four models contribute statistically significantly to explaining spatio-temporal differences in legal implementation. That is, our estimations suggests that the implementation of EU directives is shaped by a combination of the rational calculations of domestic compliance costs and reputational damage, domestically institutionalized normative obligations, and legal and political constraints. Finally, conclusions and discussion are provided in section 6.

**Implementing EU Environmental Law**

\textsuperscript{20} Mitchell 2002
According to Mitchell, an MEA is an ‘intergovernmental document intended as legally binding with a primary stated purpose of preventing or managing human impacts on natural resources.’ MEAs vary considerably, both in terms of their number of participants, geographical scale, target issues and policy requirements. Yet common to the majority of agreements are a set of obligations, actions and constraints, which states consent to follow.

In the present study, we focus on one particular intergovernmental agreement, or rather, set of agreements. Specifically, we investigate spatio-temporal variations in the implementation of a body of European law, collectively termed EU environmental policy. Although not entirely comparable with truly international environmental policy, EU environmental policy makes a useful test-case for scrutinising models of supranational legal compliance for three reasons. First, the EU has a well-developed and diverse set of environmental policies, straddling a range of issues, sectors and regulatory approaches. Therefore, the EU case has the potential to provide generalisable insights for a range of environmental regulations, capturing some of the diversity of MEAs currently in the international system. Second, unlike the majority of MEAs, data exist on the implementation of EU policy. Although not a precise measure, these data nevertheless provide an indication of the relative extent of legal implementation by member states, as given by the number of infringement cases launched by the European Commission for suspected non-implementation of directives. Third, the EU is a natural laboratory for comparative social science research. As a collection of countries with

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21 Mitchell 2003, 423
22 Sands 2003
23 McCormick 2001; Weale et al. 2000
24 Axelrod and Vig 1999
25 Sprinz 2004
important shared characteristics, but which differ along a number of recognisable and well-documented dimensions, the EU provides researchers with an excellent opportunity to identify the determinants of cross-national variations in state behaviour. Indeed, differences in member state implementation of EU environmental policy have previously been used to derive wider lessons about the determinants of MEA implementation.\(^{26}\)

Our specific focus in the present paper is the most important instrument of European environmental policy, namely, the directive. In common with many “hard law” MEAs, European environmental directives do not automatically become part of a state’s legal system.\(^{27}\) Rather, in order to become operational, they must first be transposed into domestic law by competent national and/or subnational authorities. Likewise, directives only specify the broader goals and objectives of environmental action, a characteristic shared with many MEAs. The precise ways and means to achieve these obligations are left to competent authorities.\(^{28}\)

While granting states considerable discretion, such flexibility also increases the opportunities for non-compliance with Treaty obligations.\(^{29}\) In extreme cases, governments can ignore directives altogether, although this is rare.\(^{30}\) More commonly, non-compliance arises from the late, incomplete or incorrect transposition of directives into national law; or else, the failure of competent authorities to establish adequate implementation and enforcement mechanisms.\(^{31}\)

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\(^{26}\) Vogel and Kessler 1998; Raustiala and Slaughter 2002
\(^{27}\) Jacobson and Weiss 1998
\(^{28}\) McCormick 2001
\(^{29}\) Bursens 2002
\(^{30}\) Dimitrakopoulos 2001
\(^{31}\) Grant et al. 2000
Under Article 211 of the Treaty of Rome, legal responsibility for ensuring compliance with directives falls to the European Commission\textsuperscript{32}. The Commission monitors the implementation of EU law by individual member states. In cases of suspected non-implementation, it also initiates infringement proceedings. Invariably, these proceedings begin informally, with a series of bi-lateral negotiations between the Commission and the concerned state. Typically, this is sufficient to settle legal disputes, with the majority of suspected breaches of EU law resolved without formal recourse\textsuperscript{33}.

Where dialogue and mediation fail to produce a satisfactory conclusion, proceedings may move to a formal stage, comprising three sequential steps. In the first, the Commission sends a ‘formal letter of notice’, detailing the grounds of the suspected infringement, and inviting feedback from the concerned member state. If a satisfactory response is not forthcoming, the Commission may deliver a ‘reasoned opinion’, laying-out the Commission’s view of how member state action remains inadequate, and establishing a deadline to rectify the infringement. Failure to comply with the reasoned opinion may result in the case being referred to the European Court of Justice (ECJ).

In reality, only a small proportion of actual legal breaches result in infringement proceedings. In fact, anecdotal evidence suggests that member states frequently implement directives late, without evoking a formal investigation by the Commission\textsuperscript{34}. However, because there is little concrete evidence to suggest that the detection and/or prosecution of non-compliance is systematically biased against particular member states\textsuperscript{35}, it is possible to use the number of infringement cases as a relative measure of

\textsuperscript{32} Hattan 2003
\textsuperscript{33} Davies 2001
\textsuperscript{34} Pagh 1999
\textsuperscript{35} Börzel 2001
legal implementation between member states\textsuperscript{36}. Indeed, national infringement counts have been adopted as the dependent variable in several recent statistical studies of member state compliance with European law\textsuperscript{37}, although none of these studies specifically investigates environmental directives.

In the present paper, we similarly make use of infringement statistics, and specifically, the annual number of reasoned opinions against individual member states for non-implementation of environmental directives. We opt for reasoned opinions, since of the three possible stages, they best capture differences in genuine breaches of EU law related to member states’ willingness and/or ability to comply. Thus, reasoned opinions largely exclude ambiguous infringements arising from misunderstandings between the member state and the Commission, but equally, do not simply count the most persistent and intransigent cases of non-implementation that end-up in the hands of the ECJ. Table 1 reports the number of reasoned opinions related to environmental directives issued to individual member states – aggregated into three-year averages to smooth over yearly variations – for the period 1979-2000. The table shows that all states have been the subject of proceedings. Yet it also reveals considerable variations in the number of breaches of EU environmental law, both within, and between, different member states over time.

While we use these variations in infringement proceedings in the present paper to further understanding of the conditions under which states implement MEAs, it is important to note that the EU case is unique in several respects. Most notably, environmental directives are legally enforceable by courts at the national and European

\textsuperscript{36} Bursens 2002; Sverdrup 2004
\textsuperscript{37} Guiliani 2003; Mbaye 2001; Perkins and Neumayer 2007
level\textsuperscript{38}, although as with other MEAs, legal disputes within the EU are often resolved through mediation\textsuperscript{39}. Additionally, the states comprising the EU are arguably less diverse – in terms of their administrative capacity, cognitive setting, etc. – than is the case for truly international MEAs. Yet, in many other respects, EU environmental policy and non-European MEAs share important similarities. Both are characterised by spatio-temporal variations in implementation\textsuperscript{40}, both require participants to make potentially costly domestic adjustments, both make demands on states’ legal, political and bureaucratic apparatus, and to a greater or lesser extent, both appeal to states’ normative obligations to ensure compliance. Hence we believe that the EU case contains important, generalisable lessons for MEAs both at the regional and international level.

\textbf{Deriving Theoretical Predictions}

What explains variations in the implementation of MEAs? Why do certain states fully implement environmental agreements, while others do so incompletely, or not at all? At a theoretical level, a number of theoretical models (or approaches) have been advanced to answer such questions. We focus on four widely-discussed approaches in the present paper, namely, domestic adjustment, reputational, constructivist and managerial. In

\textsuperscript{38} Readers should note that the assumed superiority of binding vis-à-vis non-binding forms of supranational environmental law remains a subject of ongoing debate, see Victor (2006) and Skjærseth et al. (2006) for relevant insights
\textsuperscript{39} Faure and Lefèvre 2005
\textsuperscript{40} Yet, as in the EU case, it is important not to overstate the scale of implementation failure. See Chayes and Handler Chayes 1993; Neyer 2004
reality, considerable diversity exists within each of these explanatory schools, as well as a
degree of overlap between them. Still, it is possible to identify a number of distinctive
assumptions underpinning each approach, although we readily admit that not everyone
would agree with our definitions.

In the rest of this section, we detail each of these models, and moreover,
formulate hypotheses designed to capture the dynamics of each model. The text is
structured into four parts, corresponding to individual theoretical explanations. We
begin with domestic adjustment approaches.

**Domestic adjustment**

The domestic adjustment model, takes its cue from theories of rational choice. Thus,
advocates of domestic adjustment-type explanations conceptualise states as rational,
calculative and self-interested actors, who make implementation decisions by weighing-
up the material costs and benefits associated with compliance. A central prediction is that
adjustment costs imposed on domestic stakeholders are a key factor influencing the
implementation of legal commitments. As the costs of implementing policy rise, so it is
suggested that actors face growing incentives to delay, dilute or even ignore their legal
obligations. These dynamics are potentially significant in the present context to the
extent that the costs of implementing multilateral environmental commitments are likely

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41 See Checkel 2001; Raustiala and Slaughter 2002; Sterling-Folker 2000
42 For examples of this reasoning, see Börzel 2003; Underdal 1998; Vogel and Kessler 1998
44 Börzel 2003
to vary spatially and temporally. We expect two such factors to influence the costs of implementing EU environmental directives.

The first is the level of ambient environmental quality, with overall compliance costs likely to be higher in states with a higher pollution load, not least because of the need for larger investments in abatement equipment. Of course, EU environmental policy is extensive, covering a range of media, resources and discharges. However, directives governing pollution emissions and/or ambient standards are likely to be especially susceptible to domestic resistance, owing to the fact that they have historically impacted politically influential groups comprising citizens (i.e. voters) and industry. A second – and closely related – factor influencing compliance costs is manufacturing-intensity. Manufacturers have been the target of a large number of EU environmental policies, many of which have potentially significant cost implications. While agricultural producers have also been subject to environmental directives, such policies have often been accompanied by offsetting payments. We therefore expect, all else equal, manufacturing-intensive states to encounter higher overall compliance costs in seeking to implement environmental directives.

Together, the above suggests that regulated parties in heavily polluted and/or manufacturing-intensive states will be more likely to “mobilise” against the introduction of new environmental policies. This, in turn, increases the risk of legal infringements as politicians and regulators respond to pressures from non-state actors to defy, delay and/or dilute environmental directives. Manufacturers are likely to be especially influential in

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45 Downie 2005
46 Zito 2000
47 The importance of business opposition in undermining the effective implementation of supranational environmental policy obligations is well documented in the literature, e.g., Weinthal and Parag 2003
48 Grant et al. 2000
this respect\textsuperscript{49} since they have received comparatively few side-payments from the EU and are typically represented by strong and well-organised lobby groups\textsuperscript{50}.

Hence:

\textit{Hypothesis 1. The higher the pollution load, the lower the implementation of environmental directives.}

\textit{Hypothesis 2. Implementation will be lower where manufacturing-intensity is higher.}

\textit{Reputational}

A second broad approach, which we label reputational, is most often associated with theories of neoliberal institutionalism\textsuperscript{51}. In common with domestic adjustment approaches, reputational ones assume rational, calculative and egoistic behaviour. However, the latter widens the scope of self-interest, focusing on external reciprocity, strategic legitimacy and reputational calculus. Thus, states comply with their legal obligations anticipating that the long-term costs from non-compliance in terms of reputational damage outweigh any short-term gains\textsuperscript{52}. More positively, it is suggested that compliance offers states an opportunity to prove their credentials as reliable and legitimate partners in co-operative ventures, with potentially positive payoffs for economic, political and military security\textsuperscript{53}.

\textsuperscript{49} Of course, manufacturers do not always oppose new environmental policies (e.g., see Wurzel 2002). Yet, across the majority of environmental directives, we expect the predominant pattern to be one of resistance.

\textsuperscript{50} Grant et al. 2000

\textsuperscript{51} Downs and Jones 2002; Keohane 1984

\textsuperscript{52} Simmons 1998

\textsuperscript{53} Chayes and Handler Chayes 1993
Within the EU context, we argue that such concerns are likely to be especially important for recent entrants. Keen to prove their credentials as “good” European citizens, and therefore dependable collaborators in EU affairs, newcomers will make greater efforts to faithfully implement environmental directives\(^{54}\). Moreover, recent entrants are likely to anticipate higher losses from reneging on their Treaty commitments. Thus, against a backdrop of limited reputational capital, newcomers will be concerned about the negative ramifications – for example, in terms of reduced political influence within EU decision-making institutions – arising from a widely-publicised record of non-compliance with European law.

Long-established member states, on the other hand, are unlikely to rely so heavily on compliance for their legitimacy, standing and reputation. Their position as legitimate members of the EU is frequently taken for granted, owing to their founding status and/or long history of political engagement. Indeed, confident of their standing and with an accumulated stock of reputational capital, long-term members may be tempted to prioritise the protection of domestic economic interests over the legal goals of EU integration\(^ {55}\).

These predications are consistent with theoretical expectations, which emphasise the importance of faithful compliance amongst new states for signalling their reputation as reliable partners in future co-operative ventures\(^ {56}\). They are also in line with the literature on Europeanization which emphasises the strategic intent of new accession states to gain legitimacy\(^ {57}\). Additionally, our expectations are supported by empirical

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\(^{54}\) Guiliani 2003  
\(^{55}\) Olsen 2002  
\(^{56}\) Downs and Jones 2002  
\(^{57}\) Lægreid et al. 2004
evidence. Several qualitative studies therefore document how concerns to nurture international legitimacy and a reputation as cooperative and responsible actors have led several developing and transition countries to make concerted efforts to fully implement MEAs\(^{58}\). More specifically, the idea that more recent entrants to the EU should have a better record of implementing directives is supported by past quantitative work, which has found a positive relationship between membership length and number of legal infringements\(^{59}\).

Another claim made in the literature is that the significance of reputational capital is influenced by power status. Underlying this argument is the idea that more powerful states command international legitimacy and influence on account of their political, economic and/or military size, lessening the strategic importance of reputation for cooperative ventures. Along similar lines, it is claimed that powerful countries are more autonomous, in that they are better able to resist international pressures to comply exercised by supranational organisation, non-governmental organisations and other sovereign states\(^{60}\).

Applied to the EU context, these insights suggest that more powerful members will be better positioned to defy costly and/or disruptive EU environmental laws\(^{61}\). Their economic, political and environmental weight means that influence in EU affairs is unlikely to depend greatly on their reputation as faithful implementations. They can, in other words, afford to defect. At the same time, powerful states are less likely to face hostile responses from fellow member states, and particularly weak ones. Fearing

\(^{58}\) Comisso et al. 1998; Zhao 2005
\(^{59}\) Guiliani 2003; Mbaye 2001
\(^{60}\) Cardenas 2004
\(^{61}\) Sverdrup 2004
negative economic and/or political consequences, weak states might be expected to avoid threatening their self-interests by mobilising shame against their larger, more powerful counterparts.

Conversely, unable to rely on economic and/or political power for influence, weaker states are likely to depend to a far greater extent on their reputation as cooperative, reliable and committed member states. Indeed, their ability to wield political influence may crucially depend on doing so. An important corollary is that less powerful states faces greater incentives to establish and maintain a reputation as good European partners through the timely and/or proper implementation of EU law.

A similar argument has been applied to explain the greater propensity of larger, more powerful member states to breach the Stability and Growth Pact rules of European Monetary Union\(^{62}\). Specifically, it is claimed that smaller states are less able to afford the loss of reputational capital arising from non-compliant behaviour compared to their larger counterparts. Likewise, the ability of the US to defy international environmental law has been attributed to its hegemonic status, which has allowed domestic elites to resist external pressure for compliance\(^{63}\). Hence we expect more powerful states to violate EU environmental laws more frequently, an expectation consistent with past quantitative studies into the implementation of all directives\(^{64}\).

Summing-up:

*Hypothesis 3. More recent entrants to the EU will have a better record of implementation of environmental directives.*

\(^{62}\) Buti and Pench 2004  
\(^{63}\) Falkner et al. 2004  
\(^{64}\) Mbaye 2001; Sverdrup 2004
Hypothesis 4. More powerful member states are likely to have a worse record of implementation.

Constructivist

A third approach used to explain (non-)compliance with legal obligations, constructivism, emphasises the normative basis of compliance. According to constructivists, choices governing legal implementation are fundamentally guided by norms, beliefs and rules, which collectively provide the foundation for individuals’ interests. Constructivist accounts adopt a process-based ontology. Hence, it is suggested that normative commitments are not prefigured, but are frequently learnt, internalised and embedded through a process of transnational engagement. Accordingly, constructivists predict that compliance happens where legalised norms are internalised, meaning that they ‘resonate and are considered legitimate locally’ (Cardenas 2004, 215), and therefore become institutionalised into accepted practice.

Within the recent literature, considerable importance has been attached to the normative identities, preferences and beliefs of civil society. Thus, it is suggested that civil society plays a pivotal role in embedding, mobilising and sanctioning normative obligations at the domestic level. Constructivist scholars within the European context have similarly emphasised the importance of national publics in determining the

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65 Sterling-Folker 2000
66 Beach 2005; Chayes and Handler Chayes 1993; Faure and Lefevre 2005
67 Palan 2004
68 Kostakopoulou 2005; Underdal 1998
69 Cardenas 2004, 215
70 Cardenas 2004; O’Neill et al. 2004
normative “pull” of European law. One claim is that positive citizen values, attitudes and beliefs towards Europe enhance the domestic legitimacy of EU forms of polity and governance. In doing so, they increase political actors’ acceptance of EU legal norms, “as being legitimate and part of the ‘law of the land’” (Beach 2005, 124), and working from a “logic of appropriateness”, their implementation of directives as a matter of normative obligation. Indeed, these ideas are consistent with notions of Europeanization which emphasise the cognitive basis of institutional change. Hence we expect countries in which the public are more supportive of the EU, in the sense of more approving of its existence, modalities and actions, will be the subject of fewer infringements for non-implementation of environmental directives.

Yet it is not only civil society which is widely implicated in the domestic incorporation of compliance norms. For constructivists working within an International Relations tradition, national political elites internalise new and/or strengthened normative commitments through “participation in a norm-governed process”. Involvement in international polity, politics and policy, in particular, is believed to support social communication, learning and the development of new normative understandings. What this suggests is that countries’ involvement in international and/or regional environmental agreements might plausibly shape compliance. With a history of international engagement, signatories to multiple MEAs might be expected to have reconfigured their preferences further from unilateralism, recognising that they hold common interests and

71 Checkel 2001; Laffan 2001
72 Mbaye 2001
73 March and Olsen 1979
74 Dyson 2000; Laffan 2001
75 Knill and Lehmkuhl 2002
76 Raustiala and Slaughter 2002, 546
stand to gain from common solutions. As a result, they are more likely to be accepting of the normative force and legitimacy of multilateral governance, and therefore comply with resulting obligations\textsuperscript{77}. Indeed, it seems improbable that signatories to multiple MEAs would be peculiarly adverse to EU directives on the grounds that they represent an unacceptable challenge to national sovereignty\textsuperscript{78}. More specifically, domestic political actors in states which are party to larger numbers of MEAs are more likely to have internalised norms regarding environmental policy as a legitimate and worthwhile focus for multilateral policy intervention, fostering institutionalised compliance behaviour. We therefore anticipate that the implementation of environmental directives and states’ cumulative experience of MEAs will be closely linked. Hence:

\textit{Hypothesis 5. Implementation of environmental directives will be better the higher the approval rate of the EU in a member state’s population.}

\textit{Hypothesis 6. Signatories to a larger number of MEAs are likely to have a better record of implementation.}

\textit{Managerial}

Even where states are compelled, coerced and/or obligated to implement international law, however, there is no guarantee that they will be able to do so\textsuperscript{79}. A fundamental claim of the fourth and final approach considered here, the so-called, managerial perspective, is

\begin{flushleft}
\textsuperscript{77} Lægreid et al. 2004  
\textsuperscript{78} Brunnée 2004  
\textsuperscript{79} Chayes and Handler Chayes 1993; Faure and Lefevre 2005; Haas 2000
\end{flushleft}
that compliance problems may continue to arise on account of various constraints. In reality, managerialist accounts capture a broad set of dynamics, several of which are potentially compatible with domestic adjustment, reputational and constructivist models. We restrict our focus here to three constraints widely discussed in the literature on supranational legal implementation and compliance. The first is the domestic political structure. A popular argument is that the number of political veto points has an important influence on the implementation of multilateral agreements. Underlying this belief is the observation that veto players may oppose the introduction of new supranational policy requirements, and therefore their incorporation into national law. Since the likelihood of delays is likely to rise with the number of veto players in government, we expect political executives in states that are more constrained by the existence of veto players to find it more difficult to implement multilateral policy requirements. This prediction is supported by case-study evidence, together with recent statistical analyses of EU directives, which have found that states with more veto players have been subject to more formal infringement proceedings.

Another constraint hypothesised to impede compliance with supranational legal commitments is a country’s domestic legal system, traditions and culture. According to several scholars, implementation is likely to run into opposition and/or delays where legal systems are more litigious, complex or tolerant of non-compliance. Conversely, where a country’s legal system settles disputes quickly, is respectful of international law and/or

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80 Dimitrakopoulos 2001
81 Haverland 2000; Ho 2002; Scruggs 2003
82 Falkner 2005; Weale et al. 2000
83 Giuliani 2003
84 Ho 2002; Simmons 2000
85 Alter 2000
compliance-oriented, implementation will proceed more smoothly\textsuperscript{86}. Within the EU, it is the Nordic states whose – Scandinavian – legal system, traditions and culture embody these characteristics most closely\textsuperscript{87}. Indeed, their peculiar approach towards conflict management and norms of faithful compliance with international law have previously been identified as factors underlying the comparatively low number of infringement proceedings raised against them, particularly beyond the formal letters stage\textsuperscript{88}.

A third set of constraints are administrative in nature. A common suggestion is that making the adjustments required to implement multilateral environmental policy commitments depends on administrative capacity, including an adequate supply of lawyers, bureaucrats and scientists\textsuperscript{89}. Along similar lines, it is suggested that the quality of the administrative resources is also important\textsuperscript{90}. Of particular relevance in this respect is the ability of government departments, agencies and personnel to facilitate and/or action the steps – legal transportation, promulgation of regulations, creation of enforcement agencies, etc. – required to implement treaty obligations. Indeed, these claims are largely consistent with past empirical studies, which have identified administrative capacity and/or quality as a constraint on the correct and/or timely implementation of both international MEAs\textsuperscript{91} and EU environmental directives\textsuperscript{92}. We therefore expect states with weak and/or inefficient bureaucratic capacity to encounter more difficulties in implementing EU environmental law.

Summing-up, then:

\textsuperscript{86} c.f. Scruggs 2003, 143
\textsuperscript{87} Bengtsson et al. 2004; Goldsmith and Larsen 2004
\textsuperscript{88} Bursens 2002; Sverdrup 2004
\textsuperscript{89} Carter 2001; Downie 2005; Jacobson and Weiss 1998; Raustiala and Slaughter 2002
\textsuperscript{90} Vogel and Kessler 1998
\textsuperscript{91} Comisso et al. 1998; Henneland and Jörgensen 2003; Weiss and Jacobson 1998
\textsuperscript{92} Bursens 2002; Falkner et al. 2004; Lampinen and Uusikylä 1998; Weale et al. 2000; also see Perkins and Neumayer 2007 for all directives
Hypothesis 7. Countries in which national governments are more constrained by veto players will have a worse record of implementing environmental directives.

Hypothesis 8. States with a Scandinavian legal system are likely to have a better record of implementation.

Hypothesis 9. Greater administrative capacity renders implementation more likely.

Hypothesis 10. Bureaucratic quality will be positively correlated with implementation.

Empirical Research Design

Dependent Variable

Our dependent variable – that is, measure of the extent to which states’ implement environmental directives – is the annual number of environment-related infringement proceedings taken against individual member states over the period 1979-2000. It is important to note that infringement data do not provide a true measure of the actual number of legal breaches committed by member states in any one year. Instead, infringements only record cases of non-implementation detected by the Commission, and moreover, currently under investigation; whether or not the breach was committed during
that year. In reality, these comprise a fraction of the overall number of legal breaches by member states.\textsuperscript{93}

Providing that “unrevealed” cases are randomly distributed across the sample, however, they should not invalidate the use of infringement data as a measure of legal implementation. Börzel \textsuperscript{94} investigates this assumption and finds little evidence for the existence of systematic bias.\textsuperscript{94} Thus, neither societal activism nor state monitoring capacity – two factors that could plausibly bias the detection and reporting of non-implementation between countries – are correlated with the number of national infringements received by individual member states. Similarly, she finds no consistent relationship between country rankings by total infringements to any of the factors – state power, level of Euro-scepticism, etc. – previously hypothesised to influence the Commission’s willingness to pursue formal proceedings. These observations do not entirely rule out the possibility of systematic bias, but do at least indicate that several of the potential biases sometimes mentioned in the literature\textsuperscript{95} may be relatively unimportant.

Of the possible infringement stages, we opt for reasoned opinions. Our choice was guided by a number of considerations. First, unlike formal letters, reasoned opinions exclude a substantial share of infringement cases arising from ambiguities and misunderstandings between the member state and the Commission,\textsuperscript{96} neither of which are relevant in the context of our four explanatory models. At the same time, reasoned opinions do not exclude potentially instructive cases of non-compliance, as is the case

\textsuperscript{93} Börzel 2001; Bursens 2002; Davies 2001
\textsuperscript{94} Börzel 2001
\textsuperscript{95} See Hattan 2003; Mastenbroek 2003
\textsuperscript{96} Davies 2001
with ECJ referrals. Only the most intransigent cases of non-implementation end-up being referred to the ECJ, meaning that they fail to capture a large number of genuine breaches settled earlier on\textsuperscript{97}. Indeed, precisely because there are very few ECJ referrals, and therefore limited variability in the data, they are poorly suited to econometric analysis.

\textit{Independent Variables}

Beginning with domestic adjustment costs, our measure of a country’s pollution performance (H1) is the average per capita pollution load index (PLI) for carbon dioxide, nitrogen oxides and sulphur dioxide emissions\textsuperscript{98}. The PLI index measures the average emission load per capita relative to the EU average in percentage terms. Values above (below) zero mean higher (lower) than average EU pollution load\textsuperscript{99}. For example, a value of 80 means that the country’s per capita pollution load was 80 per cent above the EU average, whereas a value of \textasciitilde{}20 means that it was 20 per cent below EU average. Ideally, we would have liked to use a more comprehensive measure of pollution load, going beyond air pollution. However, such data are unavailable for our period of study, with comparable indicators for water only available from 1990 onwards. Still, it is plausible to assume that a country’s per capita air emissions will be closely correlated with other forms of pollution. As our measure of the manufacturing-intensity of a country’s economy (H2), we take the manufacturing value-added share of GDP\textsuperscript{100}.

With regards to reputational variables, our measure of membership length (H3) is the number of years the country has been a member of the European Union or its

\textsuperscript{97} Börzel 2001  
\textsuperscript{98} As calculated by Klein 2005  
\textsuperscript{99} There is substantial variation across EU countries -- see Neumayer 2001b  
\textsuperscript{100} Data from World Bank 2003
predecessors. We take the natural log of this variable since we believe that the number of years will have a decreasing impact on countries’ non-compliant behaviour. In order to measure a country’s power status (H4), we use population size\textsuperscript{101}. Because it is unlikely that a country’s power status will have a linearly increasing influence on its ability to shirk treaty obligations to implement EU environmental directives, we take again the natural log of this variable.

Moving on to our variables capturing expectations derived from constructivist theories, we measure public approval for the EU (H5) using the percentage of the population stating that membership of their country in the European Union is “a good thing”. Data are taken from the Mannheim Eurobarometer Trend File 1970-2002\textsuperscript{102}. For our measure of engagement with MEAs (H6), we use the percentage share of multilateral environmental agreements (MEAs) a country has ratified\textsuperscript{103}.

In order to measure managerial restrictions imposed on executive authority by the domestic political structure (H7), we use an index of political constraints developed by Henisz\textsuperscript{104}. Building on a simple spatial model of political interaction, the index captures the structure of government in a given country, together with the political views represented by different levels of government. It measures the extent to which political actors are constrained in their future policy choices by the existence of other political actors with veto power. A dummy variable captures the effect of the prevailing Scandinavian civil law system in Denmark, Finland and Sweden (H8). Rather than lumping all the remaining countries together, we allow for more flexibility in the

\textsuperscript{101} Data from World Bank 2003 \\
\textsuperscript{102} Schmitt et al. 2005 \\
\textsuperscript{103} CIESIN 2004. Due to lack of data, values for 1998 onwards are as 1997. \\
\textsuperscript{104} Henisz 2000
estimations by further distinguishing between French civil law (Belgium, France, Greece, Italy, Luxembourg, Netherlands, Portugal and Spain), German civil law (Austria and Germany) and Common law (Ireland and United Kingdom) countries. With a set of exclusive and complete dummy variables, one dummy needs to be omitted from the estimations to serve as the reference category. In our case, this is the Scandinavian civil law dummy.\textsuperscript{105}

We measure administrative capacity (H9) using per capita income expressed as gross domestic product in purchasing power parity and constant US$,\textsuperscript{106} Although an indirect measure, it makes sense that states with greater wealth should command (all else equal) more administrative resources to implement environmental directives, an assumption confirmed in past empirical studies.\textsuperscript{107} Our fourth managerial variable, bureaucratic efficiency (H10), is measured using a score provided by the International Country Risk Guide,\textsuperscript{108} which runs from 1 (worst) to 4 (best). These data are only available from 1984 onwards, meaning that we use the 1984 value for prior years. However, because there is little variation in expert assessments of bureaucratic quality over time, this should not represent a big problem.

Additionally, we include a control variable to account for the so-called “newcomer” effect, whereby new entrants have historically been exempted from infringement proceedings for a period of approximately two years.\textsuperscript{109} Granted by the Commission in recognition of the difficulties faced by new member states in adjusting to a large number of directives, we expect the newcomer effect to have a negative influence

\textsuperscript{105} Data from La Porta et al. 1999
\textsuperscript{106} Data from World Bank 2003
\textsuperscript{107} Jacobson and Weiss 1998
\textsuperscript{108} PRS Group 2004
\textsuperscript{109} Sverdrup 2004
on the number of infringement cases. Our dummy variable is set to one for the first two
years of EU membership. Table 2 provides summary descriptive variable information.

<<INSERT TABLE 2 ABOUT HERE>>

Estimation Model

We estimate the following model

\[ y_{it} = \alpha + \beta_1 x_{it} + \gamma_t T_t + u_{it} \]

The subscript \( i \) represents each member state of the EU in year \( t \), \( y \) is the number
of reasoned opinions and \( x \) is the vector of explanatory variables. The year-specific
dummy variables \( T \) are of particular importance in the context of the present study,
capturing general developments common to all member states, but changing over time.
They include annual increases in the number of environmental directives and other
regulations, both of which might plausibly impact member state compliance\(^{110}\). They also
include changes in the Commission’s willingness to pursue infringement proceedings
against member states\(^{111}\), developments in the European legal regime for enforcing and
sanctioning non-compliance\(^{112}\), and institutional developments such as Treaty revisions
and enlargement. Year-specific time dummies can control for all these developments, as
long as they affect all member states approximately equally, without the need of formally
modelling each factor. The \( u_{it} \) is a stochastic error term.

\(^{110}\) Börzel 2001; Neyer 2004
\(^{111}\) Hattan 2003
\(^{112}\) Alter 2000
Because the dependent variable is a discrete, strictly positive count variable, ordinary least squares (OLS) is not well-suited as a regression technique, as its underlying distributional assumption is that of a normally-distributed continuous variable. A common technique for count data is an estimator based on the assumption that the underlying data is Poisson distributed. However, it implicitly assumes that the conditional mean and the variance functions of the dependent variable are equal. If this assumption does not hold, then Poisson regression is insufficiently conservative and hugely overestimates the significance of variables. We therefore use negative binomial regression, which is more flexible than Poisson, with standard errors that are fully robust toward arbitrary heteroskedasticity and autocorrelation. To deal with potential autocorrelation more directly, we also include the lagged dependent variable, but since it sometimes absorbs a large amount of variation of the data, we report two regression results: one with, and one without, the lagged dependent variable.

Results

Table 3 shows our estimation results. With regards to our hypotheses, our findings are largely consistent with expectations. Thus, we estimate a positive, statistically significant relationship between manufacturing-intensity and number of legal infringements (i.e., reasoned opinions). Similarly, our estimated coefficient for air pollution is positive and statistically significant. That is, according to our estimations, states with a higher pollution load appear to have a worse record of implementing environmental directives.

113 Cameron and Trivedi 2005
With regards to variables measuring reputational motives, the estimations are consistent with expectations. Thus, we estimate a positive and statistically significant relationship between length of membership and legal infringements. Similarly, we find that population is positively and statistically significantly correlated with legal infringements, indicating that more powerful member states are more likely to ignore and/or defy environmental treaty obligations.

Moving to constructivist variables, we find that public support for European integration is negatively and significantly correlated with the number of reasoned opinions, suggesting that governments of countries whose citizens hold favourable opinions of the EU are more likely to implement its environmental policies. We also find that states which are signatories to a larger number of MEAs have fewer infringements, a relationship which is statistically significant at the .01 level. Again, both results are theoretically consistent.

Finally, with respect to managerial expectations, we estimate a positive and statistically significant relationship between political constraints and number of infringement cases. Likewise, as expected, all the non-Scandinavian legal systems (Common law, French civil law and German civil law) have statistically significantly more infringements than the countries with Scandinavian civil law traditions, the omitted reference category. Yet our other two measures of administrative constraints – namely, bureaucratic efficiency and administrative capacity – fail to assume statistical
significance. It is worth noting that, while the two variables are correlated with each other, multicollinearity is not responsible for this result. Taking out one still leaves the other variable statistically insignificant\textsuperscript{114}. The results thus fail to confirm part of the expectations derived from managerial theories of compliance, as well as several recent case-studies\textsuperscript{115}. However, it may of course be that our highly generalised measures of administrative resources are a poor measure of the capacity/efficacy of a state’s institutions involved in implementing environmental directives. Unfortunately, more sector-specific measures of administrative resources – for example, the number of employees working in environmental protection agencies – are simply unavailable for our sample countries and years.

Our dummy control variable for newcomer status is statistically significant with the anticipated positive sign. This is the only variable that becomes marginally insignificant when the lagged dependent variable is included in the estimations. Otherwise results are robust toward inclusion of the lagged dependent variable, which itself is statistically insignificant.

What can we say about the relative explanatory power of each theory? Because the negative binomial is not a linear regression, one cannot use a measure of fit such as adjusted R-squared. Instead one needs to employ statistical information criteria such as the Akaike information criterion (AIC) and the Bayesian information criterion (BIC). Similar to adjusted R-squared, these information criteria assess the goodness of fit by assessing the explanatory power of non-linear models with reference to their log-likelihood, adjusting for the fact that models with more explanatory variables will usually

\textsuperscript{114} Using the log of per capita income makes no difference
\textsuperscript{115} Bursens 2002; Falkner et al. 2004
fit the data better. The criteria differ in the extent to which they penalize model complexity (more variables typically explain more variation in the data\textsuperscript{116}). If only the variables of each theory are entered into a regression on their own, then the managerial model has the lowest AIC and BIC, followed by the domestic adjustment, constructivist and reputational models\textsuperscript{117}. Since lower AIC and BIC values are preferred, this would suggest that the managerial model is the most and the reputational model the least preferred. However, such a comparison assumes that the explanatory models are mutually exclusive, which, neither in theory nor in reality, is necessarily true. A more pertinent question might therefore be whether each theory adds to the overall explanatory power of the model. One can test with the same criteria whether dropping the variables from any single model from the regression that includes all variables leads to a more preferred model. The test results suggest that dropping the variables of any one of the theories would lead to a less preferred model according to both AIC and BIC\textsuperscript{118}. The conclusion is therefore that all models add significantly to the model and should be included together in estimation.

**Discussion and Conclusions**

\textsuperscript{116} Cameron and Trivedi 2005  
\textsuperscript{117} Managerial (AIC: 1191.2; BIC: 1300.0); domestic adjustment (AIC: 1243.3; BIC: 1336.1); constructivist (AIC: 1246.9; BIC: 1339.6); reputational (AIC: 1247.6; BIC: 1340.3)  
\textsuperscript{118} The full model has an AIC of 1176.0 and a BIC of 1304.4. Dropping the domestic adjustment model variables increases the AIC to 1184.6 and the BIC to 1305.9. Dropping the reputational model variables raises the AIC to 1189.9 and the BIC to 1311.2. Excluding the managerial model variables increases the AIC to 1211.5 and the BIC to 1318.5. Finally, dropping the constructivist model variables raises the AIC to 1187.5 and the BIC to 1308.8. In all cases, the nested, more parsimonious models have higher AIC and BIC than the complete model, which renders the complete model the preferred one
While scholarship has gone a long way in resolving the question of why states sign-up to MEAs, far less is known about the reasons for differences in the implementation of these agreements\textsuperscript{119}. Indeed, when it comes to understanding why states do – or indeed, do not – comply with their treaty obligations to implement MEAs, it would be fair to say that theorisation has run ahead of empirical testing. Although scholars have advanced a number of theoretical models to explain differences in legal compliance, comparatively little research has been undertaken to empirically validate their respective predications\textsuperscript{120}.

In this paper, we seek to reduce this gap between theoretical and empirical understanding. To this end, we use econometric techniques to statistically test the value of four distinct theoretical approaches – domestic adjustment, reputational, constructivist and managerial – in explaining differences in the implementation of EU environmental directives. Our study makes a number of important contributions to current understanding of the conditions under which MEAs are (not) implemented. First, we provide systematic empirical support for the predictive power of two dominant rationalist explanations, notably, domestic adjustment and reputational models. While several authors have cast doubt over the idea that compliance decisions are subject to rational, calculative logic\textsuperscript{121}, our study suggests otherwise. Thus, we find that states with a higher share of manufacturing industry and/or air pollution load – characteristics which might plausibly increase the economic costs of implementing EU environmental policy requirements, and therefore opposition from governmental and non-governmental actors – have a worse record of implementing environmental directives.

\textsuperscript{119} Carter 2001; Raustiala and Slaughter 2002; Simmons 1998
\textsuperscript{120} Raustiala and Slaughter 2002
\textsuperscript{121} Weiss and Jacobson 1998 Chayes and Handler Chayes 1993; Hønneland and Jørgensen 2003
Similarly, our statistical estimations validate predications derived from reputational models\textsuperscript{122}. Recent entrants to the EU club, who presumably face strong, self-help motives to establish and maintain a reputation as “good” European partners, are more likely to implement environmental directives. Conversely, we find that more populous states have a worse record of compliance, a finding consistent with theoretical predications regarding the lower reputational penalty faced by more powerful states in defecting from treaty obligations.

Compared with the preceding two explanations, constructivist accounts have largely been ignored in the empirical literature\textsuperscript{123}. Our findings, however, suggest that constructivist explanations are potentially instructive in understanding cross-national variations in the implementation of MEAs. According to constructivists, therefore, we should expect political actors to internalise wider societal norms in making implementation decisions. Presumably, this explains our finding that member states whose citizens hold more positive sentiments towards EU integration have fewer infringements. According to the same perspective, we should expect norms regarding the role of supranational governance and environmental protection to influence compliance activity. Again, this is consistent with our finding that member states who have signed-up to a larger number of MEAs have fewer infringements.

Finally, our findings lend systematic, empirical support for managerial models of compliance, which emphasise various implementation constraints. Consistent with previous empirical work\textsuperscript{124}, we find that countries where political actors are impeded by the presence of veto players in national government are less likely to successfully

\textsuperscript{122} Downs and Jones 2002  
\textsuperscript{123} See Börzel 2003; Weiss and Jacobson 1998  
\textsuperscript{124} Guiliani 2003; Haverland 2000
implement environmental policy. Similarly, we find that countries with a Scandinavian legal system have fewer infringements for non-compliance, presumably because of their less adversarial, compliance-oriented legal culture.

Yet, while our estimation results corroborate past findings highlighting the importance of political and legal constraints\textsuperscript{125}, we find no support for the oft-made claim that administrative capacity and/or efficiency explains variations in the implementation of MEAs. Of course, it may be that our result is simply a product of our generalised measure of administrative resources, or alternatively, that our sample does not contain countries with very limited and/or inefficient bureaucratic capacity\textsuperscript{126}. Still, our results should caution against the widely-held assumption that implementation failures can be automatically blamed on administrative shortcomings. A similar conclusion has been reached by Börzel in her study of alleged non-compliance in Southern Europe\textsuperscript{127}.

Taken together, our findings lead us to three key conclusions. First, the reasons for states’ implementation – or indeed, non-implementation – of MEAs are multiple and complex\textsuperscript{128}. Accepting our premise that insights from the EU case are generalisable, it is clear that variations in implementation cannot be reduced to a single variable, suggesting a need for multivariate explanations. Indeed, given that our study is limited by the number of quantifiable variables for which data are available, we expect the underlying determinants to be even more complex than portrayed here. In particular, we expect governance-related factors – such as national bureaucratic traditions, policy styles, etc. –

\textsuperscript{125} Haverland 2000; Lampinen and Uusikylä 1998; Weale et al. 2000
\textsuperscript{126} Note, past research documenting the constraining role of administrative resources on MEA implementation is largely based on case-study evidence from low-income developing countries. See for example Blaikie and Simo 1998
\textsuperscript{127} Börzel 2003
\textsuperscript{128} Mbaye 2001; Raustiala and Slaughter 2002
to account for some of the unexplained variations in compliance with environmental
directives. A challenge for future research is to investigate the role of these contextual
and institutional determinants using a large-N approach.

A second important conclusion is theoretical and follows closely from the first.
While different conceptual models of compliance – rational choice, reputational,
constructivist and managerial – offer important insights into (non-)compliance with treaty
obligations to implement environmental policy, they need not, and should not, be seen as
mutually exclusive. By themselves, none of the models offers a satisfactory explanation
for the observed variations in the implementation of EU environmental directives.
Together, however, they provide a more complete account of variations in
implementation. We are not the first to recognise this point. Yet our study is unique in
providing statistical support for the value of four leading models of compliance in
explaining cross-national variations in the implementation of supranational treaty
obligations designed to protect the environment. Of course, this does not mean that
different states comply for the same set of reasons, and that the above models will be
relevant in understanding (non-)compliance in all instances. Rather, our study suggests
that domestic adjustment, reputational, constructivist and managerial models offer
important insights in understanding variations between countries in the degree of
compliance with supranational policy commitments.

A third conclusion centres on data. Our study examines a single example of
supranational environmental policy implementation, and moreover, one with very
specific characteristics. Yet recognising the variety of multilateral environmental

\[\text{129 Knill 2001} \]
\[\text{130 See Beach 2005; Raustiala and Slaughter 2002; Sverdrup 2004; Underdal 1998} \]
agreements, and associated governance structures, it would seem imperative to examine compliance models in a broader range of settings. Unfortunately, statistical work in this direction is restricted by a basic lack of data. We therefore finish by pointing to the urgent need to assemble new implementation datasets covering a wide range of MEAs, and furthermore, that include a number of different measures of compliance.
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# Table 1

*Number of Reasoned Opinions Issued (Aggregated over Three Year Periods)*

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Source: Centre for European Integration, Free University Berlin.
## Table 2

*Descriptive Statistical Variable Information*

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### Table 3

*Estimation Results*

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Note: Estimation is by negative binomial regression with robust and clustered standard errors. Constant and year-specific time dummies included, but coefficients not reported. * significant at .1 level ** at .05 level *** at .01 level.