

Green Catalysts? The Impact of Transnational Advocacy on Environmental Policy Leadership

by

Michael Henry Lerner

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Doctoral Committee:

Professor Charles R. Shipan, Chair
Professor Rosina M. Bierbaum
Associate Professor Brian K. Min
Professor Barry G. Rabe

Michael Henry Lerner

lerner@umich.edu

ORCID iD: [0000-0002-2402-0300](https://orcid.org/0000-0002-2402-0300)

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List of Acronyms

- BERT-QA** Bidirectional Encoder Representations from Transformers – Q&A
- CEPII** Centre d'études prospectives et d'informations internationales
- CRS-AA** Creditor Reporting System—Aid Activity
- DAC** Development Assistance Committee
- EIA** Environmental impact assessment
- EU** European Union
- EUR** Euros
- FAO** Food and Agriculture Organization
- GDP** Gross domestic product
- IDO** International development organization
- IRS** United States Internal Revenue Service
- MNC** Multinational corporation
- NAC** Network autocorrelation
- NGO** Nongovernmental organization
- ODA** Overseas development assistance
- OECD** Organization for Economic Cooperation and Development
- OPM** Orthogonal panel model
- TERGM** Temporal exponential random graph model
- TAN** Transnational advocacy network
- TNAM** Temporal network autocorrelation model
- UCDP/PRIO** Uppsala Conflict Data Program / Peace Research Institute Oslo
- US** United States
- USAID** United States Agency for International Development
- USD** United States Dollars
- V-DEM** Varieties of Democracy

Abstract

In the face of daunting environmental challenges, leadership in the development of environmental policy may be more important now than ever. While some countries are willing to devote substantial time and resources to working on environmental issues, others lag behind. In this dissertation, I explore what it means to be a policy leader, the state and trajectory of environmental policy leadership globally, and which actors systematically catalyze (or obstruct) environmental policy leadership.

I propose that policy leadership is an observable, persistent behavior in which a government is 1) innovative, adopting new policies quickly and 2) influential, inspiring other governments to adopt these same policies. I argue that transnational advocates, such as international NGOs and multinational corporations, are particularly well-positioned to strengthen (or weaken) policy leadership. Providing information, building capacity, and conducting pressure campaigns in multiple jurisdictions at the same time, transnational advocates are uniquely positioned to affect both the spread and uptake of new policies. Using novel data on the adoption of 3,000 environmental policies by 185 countries, I measure leadership in the development of environmental policy over time and assess the role of transnational advocates in policy development. I find that large international environmental NGOs spark environmental policy leadership, particularly in developing countries and on issues related to traditional environmental topics of flora, fauna, and pollution. In contrast, lobbying by multinational corporations in developed countries sharply reduces environmental policy leadership. These results demonstrate the substantial and varied impacts of transnational advocacy on environmental policy leadership.

I make three notable contributions in this dissertation. First, I improve on prior

conceptualizations of policy leadership, providing a definition that is straightforward to operationalize while speaking to more general understandings of leadership. Second, I develop a novel method for identifying policy adoptions from a compilation of laws and regulations; this generates a new database of environmental policy adoptions that overcomes the geographic and topical limitations of existing datasets. Finally, I contribute the first systematic, quantitative evidence of the impact of transnational advocates on policy change, demonstrating the importance of their activities for environmental policy development.

With little time to waste, it is critical to understand why and when governments act as environmental policy leaders, and what can be done to facilitate environmental policy leadership. Through this research, it is clear that accounting for the activities of transnational advocates should be a key component of any attempt to catalyze proactive and meaningful environmental policy change.

Chapter 1

Introduction

On December 12, 2020, the United Nations, the United Kingdom, and France co-hosted the Climate Ambition Summit, a virtual event intended to accelerate efforts to address climate change. Perhaps the highest-profile event of a rapid series of global initiatives on climate change, biodiversity, and ecosystem conservation, 75 countries presented new commitments, including achieving carbon neutrality, raising carbon taxes, and ceasing oil and gas exploration, while representatives from the technology, cement, and airline industries announced voluntary commitments to advance energy efficiency, use renewable energy, and achieve net-zero carbon emissions. United Nations Secretary-General António Guterres celebrated the event’s success, observing, “The Summit has now sent strong signals that more countries and more businesses are ready to take the bold climate action on which our future security and prosperity depend” ([United Nations Climate Change 2020](#)).

Recent events like the Climate Ambition Summit are encouraging, but, as the Secretary-General alluded to indirectly, there are some countries ready to take bold action on climate—but others are not. The uneven commitment by national governments to leading the development of environmental policy stands as a major challenge to address persistent environmental problems. In the fifty years since the first Earth Day in 1970, some governments, such as Costa Rica, have stepped up to take high-profile leadership roles ([Boza 1993](#); [Steinberg et al. 2001](#)), while others have stalled or even retreated

(Jänicke 2005). In 2012, for example, the Dutch government publicly stated that they “did not want to be a frontrunner” on climate action (Minnesma 2019). In light of mounting global environmental challenges and increasingly urgent calls to action (e.g., United Nations Climate Change 2020; Nature Climate Change 2020), there is an ongoing deficit of leadership in environmental policy. What, then, works to catalyze environmental policy leadership?

In this dissertation, I contribute a new, more precise conceptualization of environmental policy leadership, and formulate and test a novel, network-based theory of the catalytic impact that transnational environmental advocacy has on environmental policy leadership. First, I add conceptual clarity by proposing a theory-informed and empirically-rooted definition of policy leadership consisting of an internal component—frequent innovation—and an external component—widespread influence. I present policy leadership as a persistent and observable behavior compatible with systematic measurement and explanation, rather than imbuing the concept of policy leadership with subjective or normative meaning. Second, I create a novel dataset of 3,000 environmental policy adoptions from around the world to construct a dynamic measure of environmental policy leadership (and its constituent components of innovation and influence) for 185 countries between 1950 and 2019, providing the most comprehensive presentation to date of empirical variation in the evolution of environmental policy leadership among countries and over time. Third, I assess the extent to which changes in environmental policy leadership are explained by the activities of the largest transnational environmental advocates, a set of actors that include environmental non-governmental organizations (NGOs), multinational corporations, and international development organizations (IDOs).

I find strong evidence that large international environmental NGOs have a robust, positive, and substantively important effect on environmental policy leadership. Further investigation reveals that this effect is concentrated in developing countries and on traditional environmental policy issues relating to flora, fauna, and pollution. My results also indicate that lobbying by multinational corporations leads to a sharp decrease in environmental policy leadership in developed countries. Environmental spending by IDOs

generally does not affect environmental policy leadership.

Overall, my findings indicate that transnational environmental advocates can play an important role in both catalyzing and obstructing environmental policy leadership. The practical implications of my analysis suggest that large international environmental NGOs can be effective advocates for policy leadership, primarily in developing countries and for policies relating to fauna, flora, and pollution. Additionally, advocates for greater environmental policy leadership may want to take steps to limit lobbying by multinational corporations in developed countries, as corporate environmental lobbying tends to weaken rather than enhance environmental policy leadership.

1.1 Why study (environmental) policy leadership?

Emphasizing the importance of the role states play in shaping the speed and spread of public policy, I define policy leadership as a compound concept consisting of the rapid adoption of new policy ideas and widespread influence on the policymaking of other jurisdictions. Encompassing both domestic policy change and the projection of policy influence abroad, policy leadership aligns with more generic definitions of leadership that insist upon the combination of decisive action (“walking the walk”) and the inspiration of others (“talking the talk”). As frequently observed by policy diffusion scholars, a complete understanding of policy change requires the consideration of both internal and external processes (Berry and Berry 2014).

Policy leadership also speaks to “second image reversed” analyses (Gourevitch 1978), which trace the origins of domestic policy change to international examples and dynamics. Policy leadership emphasizes that some countries contribute more examples, and attract more followers, than others. With rapid domestic policy changes that start or accelerate processes of policy diffusion, understanding the causes and consequences of policy leadership is likely to be an outcome of interest for any scholar of policy change.

Environmental policy is a particularly promising domain for studying policy leader-

ship.¹ Countries face similar environmental problems and have become more and more connected to each other through trade and communication over the past several decades. Moreover, environmental policy has been the topic of intensive international cooperation for decades, especially since the 1960s (Knill et al. 2010; Andersen and Liefferink 1997). This cooperation goes beyond international environmental agreements, extending to international environmental standards and programmatic interventions. While the national differences in culture, institutions, and economic relations are likely to persist to some extent (van Waarden 1995), it is increasingly plausible that policymakers from different governments learn from and coordinate with each other (Lenschow et al. 2005).

An important implication of strengthening environmental policy leadership is the rising potential for environmental policy convergence (Knill et al. 2012a). Environmental policy leadership could produce a race to the bottom in environmental protection (Drezner 2001), as has been observed in corporate tax competition (Swank 2006), the downsizing of the public sector (Lee and Strang 2006), and other policy topics. In the environmental context, this dynamic could produce, among other examples, “pollution havens” (Cole 2004).

Alternatively, environmental policy leadership may produce a race to the top, in which the pro-environmental policies of powerful countries push other governments to strengthen their own policies or risk a deterioration in economic or political relations—a phenomenon commonly referred to as the “California effect” (Vogel 1997). While case studies² and descriptive analyses³ suggest that countries’ environmental policy repertoires are becoming more similar, the contributions of specific factors driving environmental policy convergence are only starting to come into focus.

¹Environmental policy is the set of “tools, techniques, programs, instruments, plans, and ideas associated with the governance of ecosystems and their interactions with society” Pacheco-Vega (2021, p.387).

²For example, Héritier (1995), Liefferink and Andersen (1998), Vogel (2018).

³For example, Tews et al. (2003), Busch et al. (2005), Liefferink et al. (2009), Knill et al. (2012a), Sommerer and Lim (2016).

1.2 Environmental policy leadership: The known and unknown

To understand how and why transnational advocacy should matter for environmental policy leadership, it is important to first step back and consider what prior analyses have uncovered and what remains overlooked. There is a considerable body of work on leadership in political science, ranging from analyses of individual politicians to discourse analysis. The study of leadership in policy development has a similarly long history, often traced back to Walker's (1969) essay on leader states in US policymaking. Over the past 25 years, scholars have paid particular attention to policy leadership in the development of environmental policy, with work spanning from international environmental and climate regimes,⁴ regional environmental policy,⁵ and national environmental policy.⁶ In this literature, scholars have investigated the relationship between environmental policymaking and a suite of internal factors, located within a focal government's jurisdiction, and external factors, events or processes from international fora or the jurisdictions of other governments that influence the focal government's policymaking process (Collier and Messick 1975; Berry and Berry 2014). Policy leaders are typically identified through some combination of domestic policy activity and the existence of followers (Lieverink and Wurzel 2017; Jänicke and Wurzel 2019).

Despite the considerable attention of scholars to environmental policy leadership, it is surprising how many gaps remain in our knowledge of this topic, and how big these gaps are. For example, studies have identified a range of structural factors that matter for environmental policy leadership, but these tend to change slowly and thus struggle to explain variation in policy leadership over time. Similarly, while scholars have shown that transnational communication is an important driver of environmental

⁴For example, Andresen and Agrawala (2002), Karlsson et al. (2011), Parker et al. (2015), and Keohane (2017).

⁵For example, Liefferink and Andersen (1998) and Jänicke and Wurzel (2019).

⁶On international policy leadership, see Young (1991), Underdal (1994), Grubb and Gupta (2000), Wurzel and Connelly (2011). On regional environmental policy leadership, see Andersen and Liefferink (1997), Jordan et al. (2010), Jänicke and Wurzel (2019). On national environmental policy leadership, see Héritier (1995), Steinberg et al. (2001), Liefferink et al. (2009), Schaffrin et al. (2014).

policy leadership, there has been little consideration of indirect forms of communication brokered by transnational advocates. Moreover, as I describe in detail in Chapter 2, existing conceptualizations of environmental policy leadership have been insufficient and, as demonstrated in a systematic review of existing datasets in Chapter 4, empirical tests tend to be on a narrow range of policies in only a handful of countries.

In the remainder of this section, I provide a brief overview of the state of the literature on the internal and external drivers of environmental policy leadership, noting areas of disagreement, conflicting or weak evidence, untested assumptions, and oversights. This discussion sets the stage for my own, improved theory and conceptualization of policy leadership, which I present briefly in the following section and explore in greater detail in Chapter 2.

1.2.1 The internal drivers of environmental policy leadership

Scholars have identified four types of internal drivers of environmental policy leadership: economic resources and structure, institutional capacity, public demand for environmental policy, and environmental problem pressure.⁷ Starting with economic considerations, the political economy of environmental policy leadership will vary according to the economy's structure of production and consumption. Policymakers have stronger incentives to develop environmental policy when their economies depend on agriculture and industry, as these policies have more direct impacts on resource-intensive agricultural and industrial production more than service industries (Salzman 1999). The total level of economic production is also believed to affect policy leadership, as market size is a critical component shaping international regulatory competition (Vogel 1997). There is also the potential relevance of economic resources on environmental policy leadership via the Environmental Kuznets Curve, but this relationship has found only limited empirical support (Stern 2004).⁸

⁷I derive these categories from Jänicke (2005).

⁸The Environmental Kuznets Curve is a hypothesized relationship between environmental degradation and economic development, with environmental degradation accelerating as income per capita rises, but at some point, the trend reverses such that increasing incomes lead to environmental improvement, resulting in a U-shaped function of income per capita (Stern 2004).

Turning to institutional capacity, environmental policy leaders must have sufficient human and financial resources available to devote toward environmental policymaking and, possibly, promoting environmental policy abroad (Stadelmann and Castro 2014). A ministry with a specific portfolio of environmental policies is a clear sign that at least some minimum amount of resources is allocated toward environmental policymaking (Knill et al. 2010). The existence of an environmental ministry also facilitates the application of political capital toward environmental policymaking by giving voice to environmental issues in a government cabinet (Busch and Jörgens 2005; Aklin and Urpelainen 2014). A second institutional consideration is the number of procedural hurdles policymakers must navigate to enact environmental policy proposals. If there are more institutional constraints, often measured in terms of the number of veto players in the policymaking process (Tsebelis 1995; Tsebelis et al. 2002), it tends to be more challenging to change environmental policy (Knill et al. 2010), and thus more difficult to exercise environmental policy leadership.

Environmental policy leadership is thought to be closely related to the demand for environmental protection. This demand may be most visible in the preferences of governing parties (Knill et al. 2010). However, there is open debate on whether the left-right dimension is the most important for environmental policy leadership, with inconsistent empirical support for the proposition that left-wing governments demand more environmental protection.⁹ These mixed results may reflect the potential for environmental issues to cut across the left-right spectrum, with religious conservatives framing environmental policy as saving “God’s creation” and socialists preferring to maintain economic employment over environmental protection (Neumayer 2003). However, if the governing party is in favor of strong environmental protection, regardless of its ideological position, environmental policy leadership becomes more likely (Knill et al. 2010). Looking beyond government, there is strong evidence that environmental policy leadership is more likely when there is a high level of general environmental awareness in the population (Ander-

⁹Findings supporting the pro-environmental consequences of leftist governments include King and Borchardt (1994), Jahn (1998), Neumayer (2003). Findings that do not support the proposition include Scruggs (1999) and Knill et al. (2010).

son et al. 2017) and when there is a strong presence of domestic environmental NGOs (Stadelmann and Castro 2014; Pacheco-Vega and Murdie 2020).

The final set of domestic factors is environmental problem pressure, with the expectation that governments should be more likely to act as environmental policy leaders as a function of the severity of their environmental problems. However, the direction of this relationship is not clear. While many analysts propose that governments should become more responsive to environmental concerns as problems worsen (Ringquist 1994; Sapat 2004), others argue that governments that have already overseen the degradation of environmental quality are more likely to maintain their record of poor environmental governance and continue to ignore problems despite deteriorating conditions (Stadelmann and Castro 2014). Analysts have also differed in their measurement of environmental problem pressure, especially for analyses across a broad range of environmental policies. Common measurement approaches are population density, energy use, and carbon dioxide emissions per capita (Holzinger et al. 2008b), but the conceptual relationship between these measures and specific environmental problems (e.g., land degradation) can be relatively weak.

In sum, there is widespread agreement that economic resources, institutional capacity, the demand for environmental policy, and environmental problem pressure affect environmental policy leadership. Some of these factors have received relatively strong empirical support, such as the importance of a ministry dedicated to environmental policymaking and the environmental preferences of parties in government. Other factors have more mixed evidence, with wide variation in the direction and strength of their relationship with environmental policy leadership depending on the analyst's specific measurement and modeling strategy. This latter category includes economic wealth, leftist governments, and environmental problem pressure.

A key knowledge gap regarding the internal drivers of environmental policy leadership is that many of the factors identified in the literature tend to change slowly. Characteristics like wealth, population density, and the number of domestic environmental NGOs tend to persist from year to year. As a result, while these variables can explain abso-

lute levels of environmental policy leadership, they have only a limited ability to explain variation in environmental policy leadership over time.

1.2.2 The external drivers of environmental policy leadership

Prior work has examined three types of relationships external to a government's jurisdiction that affect environmental policy leadership: cooperative harmonization, coercive imposition, and transnational communication (Busch and Jörgens 2005; Holzinger et al. 2008b). Cooperative harmonization describes interdependent policymaking stemming from international agreements between governments. While cooperative harmonization produces international institutions that reflect the preferences of member states (Oberthür and Roche Kelly 2008; Wurzel et al. 2017), it is thought to exert an independent effect on environmental policy leadership because 1) cooperation is needed to better realize governments' own policy preferences (e.g., in the presence of cooperation problems) and 2) environmental policy is just one of many issues that lead countries to participate in international institutions, especially broader institutions like the European Union that facilitate cooperation on a wide range of topics (Holzinger et al. 2008b; Martin and Simmons 1998). However, even EU regulations are no guarantee of national-level policy adoption, due to both the incorporation of flexibility mechanisms and a deficit of implementation (Héritier and Knill 2001). Cooperative harmonization is important, but no all-encompassing, as reflected in the only partial convergence of EU member states' national environmental policies (Liefferink and Jordan 2005).

Coercive imposition describes a less cordial version of cooperative harmonization, in which there are material consequences for governments that fail to adhere to stipulations of more powerful institutions. This dynamic can be seen in the environmental policymaking of EU applicant countries, which are obliged to adopt certain policies to be considered for membership (Schimmelfennig and Sedelmeier 2004; Mattli and Plümper 2004), as well as in developing countries seeking financial assistance from the World Bank (Biersteker 1990; Busch et al. 2005). However, doubt remains regarding the prevalence with which coercion impacts policy leadership in practice (Brooks 2005,

2007), as the potential for such conditions may simply provide a convenient excuse for pursuing controversial reforms willingly initiated by host governments (Mukherjee and Singer 2010).

Perhaps the most important means by which policy leaders influence their followers is through transnational communication of policy ideas (Weidner 2002; Kern et al. 2001). Since the 1970s, institutional environmental protection by national governments has become a norm of modern statehood—an outcome credited in large part to transnational communication (Meyer et al. 1997). Policymakers may meet directly with one another in bilateral settings and, with the aid of cultural similarity in language, religion, or geographical proximity (Simmons and Elkins 2004; Lenschow et al. 2005; Holzinger et al. 2008b), develop similar institutions (DiMaggio and Powell 1983) and engage in policy transfer (Bennett 1991; Brooks 2005). Alternatively, policymakers may interact at international meetings (Busch et al. 2005). For example, countries that frequently put on events together at United Nations climate change conferences are more likely to adopt climate policies (Kammerer and Namhata 2018). Similarly, and perhaps more forcefully, Meyer et al. (1997) argue that “formalized national [environmental] ministries arise only when enough international conferences and organizations exist for ministers to attend” (639). Policymakers also need not engage directly with each other but instead communicate via go-betweens (Graham et al. 2013). As discussed further in Chapter 3, these go-betweens may be epistemic communities of scientists and experts (Haas 1992), transnational advocates, or transnational networks of advocates (Keck and Sikkink 1998, 1999). Scholars have only examined the policy impacts of transnational communication at international meetings, typically by counting the number of shared institutional memberships (Holzinger et al. 2008b; Greenhill 2015) or the number of co-sponsored side events at multilateral conferences (Kammerer and Namhata 2018), generally overlooking both direct bilateral interaction and the effect of transnational advocacy.

Overall, there is strong evidence that cooperative harmonization matters for environmental policy leadership, but it provides no guarantee of leadership. In contrast, coercive

imposition is possible, but it has attracted only weak empirical support. Transnational communication has generated enduring interest from scholars and considerable theoretical development, and the effect of direct policymaker interaction on policy leadership has received empirical support.

As this discussion demonstrates, while scholars have made substantial progress in identifying the external drivers of environmental policy leadership, there remain important gaps in knowledge. For example, there tend to be limited opportunities in practice for policymakers to interact at international fora, which are oriented around only a handful of high-profile topics (e.g., climate change). The empirical effect of other channels of transnational communication has not been thoroughly evaluated, even though these are often deeper and more enduring forms of engagement. For example, while there is indicative evidence that transnational environmental NGOs stimulate environmental policy leadership across countries (Steinberg et al. 2001), their impact has not been systematically investigated—a gap that motivates this analysis.

1.3 Overview of the argument

My dissertation consists of two components. The first is a primarily theoretical portion in which I propose a new conceptualization of policy leadership and, within the environmental context, explain variation in environmental policy leadership as a function of the activities of transnational environmental advocates. The second part is a primarily empirical portion in which I create a new dataset on transnational environmental advocacy and environmental policy adoptions and assess the extent to which transnational environmental advocates catalyze changes in environmental policy leadership. I summarize each of these components below.

1.3.1 Theory and conceptualization of environmental policy leadership

I propose a new conceptualization of policy leadership and, within the environmental context, explain variation in environmental policy leadership as a function of the activities of transnational environmental advocates. Building on the existing literature on both leadership in general, and policy leadership in particular, I define policy leadership as the phenomenon in which a government is 1) highly innovative, adopting new policies quickly *and* 2) influential, substantially shaping the diffusion of policies to other jurisdictions. This definition stems from the premise that policy leadership is a persistent and observable behavior in which organizations take decisive action *and* inspire others to follow their example (Helms 2012).¹⁰ A key benefit of this definition is that it can be translated into the language of network analysis. Using a network perspective, the internal and external components of policy leadership can be reformulated in terms of a policymaking network in which countries, the nodes in the network, are more or less innovative, and countries influence each other through persistent leader-follower relationships.

Of the internal and external factors affecting countries' level of environmental policy leadership, perhaps the most widely studied may be transnational communication. But while the effects of direct communication between policymakers are relatively well-studied (e.g., Kammerer and Namhata 2018), the causes of such communication are often overlooked. I focus in particular on transnational actors as potentially important agents for catalyzing environmental policy leadership.

Transnational advocacy has existed for decades (Gourevitch 1978), but policy advocacy by environmental non-governmental organizations (Reimann 2006), multinational corporations (Kim and Milner 2021), and international development organizations (Rahman et al. 2016) has professionalized and expanded across national boundaries in recent

¹⁰Some scholars hold that policy leaders should also practice and inspire exemplary behavior, such as enacting the most stringent policies (e.g., Andersen and Liefferink 1997; Jänicke 2005). As I discuss in the following chapter, stringency is often a difficult concept to operationalize, and, more importantly, requiring policy leaders to exhibit exemplary behavior fails to capture the potential impact of policies that reduce environmental stringency. As such, policy stringency falls outside of the scope of this dissertation. However, I return to a discussion of the implications of transnational advocacy for environmental policy stringency in the conclusion.

decades, creating transnational advocacy networks (Keck and Sikkink 1998, 1999). By providing information, building human and financial capacity, and waging pressure campaigns, transnational advocates seek to raise countries' environmental policy leadership by speeding the adoption of new environmental policies and amplifying the influence of countries that adopt favored policies. In practice, the efforts of transnational environmental advocates can take a wide range of forms, from educational workshops to lobbying legislators to placing policy conditions on grants or investment. In this dissertation, I provide the first quantitative assessment of whether and when the activities of transnational advocates systematically affect environmental policy leadership.

Viewing this analysis from an alternative perspective, I argue that one way to establish the effectiveness of transnational environmental advocacy is to assess the extent to which it systematically shapes the adoption and spread of environmental policy. Typically, scholars focus on individual episodes in which advocacy mattered or did not matter for the adoption of a given policy in a particular context. I make a theoretical contribution by looking at policy advocacy as a long-running series of interactions in which an advocate's influence on the policymaking process makes some marginal increase in the probability of a policy proposal's success.

1.3.2 Measuring and explaining variation in environmental policy leadership

As I discuss in detail in Chapter 3, any attempt to evaluate the effect of transnational advocacy on environmental policy leadership requires data on environmental policymaking around the world, over time, and across multiple policy areas. Based on a systematic literature review, I determine that existing datasets have insufficient topical and geographic scope. Accordingly, I introduce a novel dataset of environmental policies across the entire topical domain of environmental policy, the largest of its kind and a substantial improvement over existing datasets in its temporal, topical, and geographic scope. I also compile original data on the activities of the eleven largest transnational environmental NGOs, the largest subsidiaries of all S&P 500 firms, and the disbursement of funds for

all environmental projects funded by all bilateral and multilateral IDOs reporting to the Organization for Economic Cooperation and Development (OECD) Development Assistance Committee (DAC) database. All three types of transnational advocates will push policymakers to devote more time and resources to developing new environmental policies. Individual advocacy organizations may disagree on the details of specific proposals (e.g., setting a carbon tax at \$50 or \$10 per ton), but they will all want the government to take a clear position on a given issue.¹¹

I then calculate dynamic environmental policy leadership scores for 185 countries between 1950 and 2019. Specifically, I measure policy innovation as the rate at which lawmakers adopt new environmental policies and influence as the number of instances in which a country's environmental policy adoptions persistently predict another country's policy adoptions. I combine each country's innovation rate and number of influence relationships to create a unified measure of policy leadership. With this measure, I provide the first empirical description of environmental policy leadership across the entire domain of environmental policy, at a global geographic scale, and over the entire period of modern environmental governance.

Next, I estimate the relationship between the activities of transnational environmental advocates and environmental policy innovation, influence, and leadership for the period 2002–2019. On average, large international environmental NGOs lead governments to increase their rate of environmental policy innovation by 6.6%, increase their probability of forming a leader-follower relationship with another country by 9.4%, and, consequently, raise their environmental policy leadership by 7.2%. This effect is moderated by the broader economic context, organizational strategy, and issue characteristics. International environmental NGOs catalyze environmental policy leadership primarily in developing (non-OECD) countries. In terms of organizational strategy, I show that environmental NGOs with collaborative or confrontational styles can affect environmental policy leadership, but their respective efficacy diminishes when both confrontational and collaborative organizations are present at the same time. The characteristics of the issue

¹¹There may be instances in which an advocate prefers ambiguity for strategic reasons, but I assume this is relatively rare.

at hand also appear to matter, with environmental NGOs making the largest impact for policies relating to flora, fauna, and environmental media (e.g., air and water).

Lobbying by multinational corporations and environmental spending by IDOs are not related to environmental policy leadership on average. Further, environmental lobbying by multinational corporations leads to a substantively large decrease of 28% in environmental policy leadership in wealthy OECD member states. This result contrasts with theories of multinational corporate support for environmental policies in developing countries (e.g., [Garcia-Johnson 2000](#)) and suggests that in developed countries, multinationals behave like their domestic counterparts in largely opposing environmental policy change (e.g., [Baumgartner et al. 2009](#)).

Overall, these findings indicate that transnational advocacy by international environmental NGOs leads governments in developing countries to demonstrate greater leadership in the development of environmental policy, while lobbying by multinational corporations stymies environmental policy leadership in developed countries.

1.4 Contributions

This project makes several contributions to the study of policy leadership and environmental advocacy. First, I make a conceptual contribution to the study of policy leadership. I deviate from subjective, normative, or mechanism-specific definitions, proposing instead that policy leadership is the combination of rapid policy adoption and widespread influence. Rather than focusing on the merit of policies adopted and disseminated by policy leaders, I conceptualize policy leadership as a persistent, value-neutral organizational behavior. While policy leadership is a latent attribute, recent advances in the measurement of policy innovation ([Boehmke and Skinner 2012](#)) and policymaking influence relationships ([Desmarais et al. 2015](#)) facilitate the intersubjective observation of policy leadership.¹² In many ways, my approach to policy leadership aligns with the priorities of earlier scholarship in its emphasis on both the rapid policy adoption and patterns in

¹²In using the term “intersubjective,” I mean that the measure does not depend on the researcher’s experience and perspective, instead “existing between conscious minds” [OED Online \(2021\)](#).

the diffusion of new policies (e.g., Walker 1969).¹³

Second, I make a meaningful contribution to the study of transnational advocacy by linking the activities of advocates to actual changes in public policy. There are deep literatures on the organization and strategic behavior of NGOs (e.g., Hadden 2015; Hadden and Jasny 2019; Stroup and Wong 2017), businesses (e.g., Brulle 2018; Cory et al. 2021), and IDOs (e.g., Hicks et al. 2010; Rahman and Giessen 2017), but there is relatively little work on the specific policy impacts of advocacy. This lacuna is, in part, due to the difficulty of establishing a credible counterfactual of policy change in the presence or absence of advocacy. To overcome this challenge, I formulate a theory of policy advocacy that rests on three propositions that have not been sufficiently emphasized in prior work. First, the unique position of transnational advocates relative to domestic policymaking processes allows for the construction of a counterfactual for understanding their impact on policy change. Second, policy advocacy is most profitably viewed from a probabilistic perspective, requiring the examination of a wide range of policies across many country-years. Third, a key consequence of the activities of transnational advocacy networks, which are themselves already the subject of considerable study (e.g., Keck and Sikkink 1998, 1999), is the structure of persistent transnational policymaking networks.

Third, from an empirical perspective, I offer many advances in this project. I address longstanding imbalances in the topical and geographic coverage of data on environmental policy adoption by creating a dataset of environmental policy adoptions that spans multiple decades, includes nearly every country, and reaches across the full range of environmental topics. Aiming to contribute to growing interest in studying public policy beyond developed countries and thematically-narrow areas (e.g., Sommerer and Lim 2016; Boehmke et al. 2020), this dataset lays the foundation for a wide array of future studies on environmental policy change around the world. I also collect a new dataset on the activities of international environmental NGOs and create new measures of the geographic and temporal variation in the activities of multinational corporations and financial flows from IDOs. Responding to calls for large-N quantitative studies that test

¹³A policy is new if it is the first such policy to be adopted by a *particular* government (as opposed to being the first time such a policy is adopted by *any* government).

and compare effects of multiple causes of policy change across different topics (Holzinger et al. 2008a), I leverage these data to analyze the impact of three of the most important types of transnational relationships affecting environmental policy development. To my knowledge, this study is the first quantitative analysis of the role international NGOs, IDOs, or multinational corporations play as agents of policy leadership, spurring (or obstructing) domestic environmental change and accelerating (or slowing) the spread of policy ideas across the jurisdictions in which they work.

Finally, this paper speaks directly to the practical challenge of fostering leadership in environmental policy. With a growing need for urgent action to address climate change, the loss of biodiversity, and many other global environmental problems, it is increasingly important for governments to invest in and promote innovative approaches to environmental governance. By measuring and explaining variation in environmental policy leadership, I identify the countries on the cutting-edge of environmental policy development with the ability to shape global trends in environmental governance. In finding that transnational advocates can catalyze the growth of environmental policy leadership, I provide evidence of the important role transnational advocates play in global environmental governance.

1.5 Plan of the dissertation

In the remainder of this dissertation, I offer a new definition and theory of environmental policy leadership, a novel approach to measuring the concept, and explain its variation across countries and over time. The purpose is to better understand the extent to which transnational advocates systematically catalyze changes in environmental policy leadership. The analysis proceeds as follows.

The next chapter (Chapter 2) develops a network-based understanding of policy leadership. I place policy leadership in the context of an array of other concepts regarding change and interdependence in policymaking, consider the strengths and weaknesses of existing definitions of policy leadership, and summarize trends in the measurement and

explanation of policy leadership. I detail a new definition of policy leadership consisting of rapid policy adoption and widespread influence on policy diffusion, components rooted in the timing and pattern of policy change. I also discuss policymakers' incentives and disincentives for environmental policy leadership. I then demonstrate how policy leadership can be represented as a network graph, laying the theoretical foundation for measuring and explaining environmental policy leadership in future chapters.

In Chapter 3, I delve into the ways in which transnational advocates can act as catalysts of environmental policy leadership. I explain the mechanisms by which advocacy impacts the policymaking process and characterize three key transnational environmental advocates: international environmental NGOs, multinational corporations, and IDOs. I also describe new country-level data on the activities of these advocates over time. I outline the challenge of evaluating the impact of transnational advocacy and propose that changes in policy leadership are suitable outcomes for measuring the effectiveness of policy advocacy over long periods of time. Based on this proposal, I elucidate a set of expectations regarding the potential impacts of transnational advocacy on policy leadership.

Chapter 4 presents a new database of environmental policy adoptions. Based on a systematic literature review, I show that existing data on environmental policy adoptions are not balanced in their geographical and topical content, with strong biases in favor of the inclusion of developed countries and a relatively small subset of topics in the environmental policy domain. Using FAOLEX, the largest global compilation of national environmental laws and regulations, I describe a methodology for identifying distinct environmental policies and their earliest dates of adoption in each country. I leverage these data to create the dependent variables for my analysis, environmental policy innovation, influence, and leadership from 1950 to 2019.

Chapter 5 empirically tests the hypotheses that emerge from the discussion of transnational advocacy in Chapter 3. Using measures of environmental policy leadership derived from the FAOLEX database, I assess the extent to which the activities of international environmental NGOs, multinational corporations, and IDOs affect

environmental policy leadership, as well as its constituent components of policy innovation and influence. I end the chapter by considering the conditions for successful environmental advocacy, finding that the impact of transnational advocacy on environmental policy leadership depends on a country's level of economic development, the advocate's use of collaborative or confrontational tactics, and whether the issues at hand relate to resource use or more traditional environmental issues of flora, fauna, and pollution.

My dissertation concludes that transnational advocates play an important role in environmental policy leadership, acting both as catalysts or obstacles for environmental policy leadership. Through a combination of information provision, capacity building, and pressure campaigns, environmental NGOs are effective in encouraging policymakers in developing countries to adopt policies more quickly, while multinational corporations successfully slow the pace of environmental policy development in developed countries. Both environmental NGOs and multinational corporations play a linking role, strategically amplifying the influence of the governments with which they interact. These results suggest that transnational advocacy, especially by international environmental NGOs, can be a viable means to respond to increasingly urgent calls for environmental policy leadership. The concluding remarks in the final chapter contextualize my findings and discuss the strategic implications for more effective transnational advocacy.

Chapter 2

Developing a Network-based Understanding of Policy Leadership

Leadership, broadly understood, consists of decisive actions that inspire others to follow (Helms 2012). But, despite attracting substantial attention from scholars, policy leadership remains an elusive and contested concept. In this chapter, I begin by briefly explaining policy leadership's relation to other concepts that describe trends and interdependence in policymaking, such as policy diffusion and policy transfer. I then assess the strengths and weaknesses of existing understandings of policy leadership before proposing a new conceptualization rooted in the view that leadership is a persistent and observable behavior. Finally, I construct a typology based on my definition of policy leadership that describes ideal-type roles countries play in policy development and transpose this typology into a network graph, an analytical move that provides a convenient theoretical platform for both measuring and explaining variation in policy leadership.

2.1 Overview of prior work on policy leadership

Leadership in policy development is a longstanding topic of interest to scholars across the subfields of political science. Perhaps the earliest work on policy leadership is in American politics, generally focused on the longstanding problem of untangling the policymaking

relationships among the U.S. states (e.g., Walker 1969; Vogel 1997; Desmarais et al. 2015). Scholars of comparative politics have also taken an intense interest in how foreign policymaking can lead to domestic policy change in other countries (e.g., Lundqvist 1974; Gourevitch 1978; Sommerer and Lim 2016). International relations has engaged with policy leadership both in international fora (e.g., Young 1991; Liefferink and Andersen 1998; Jänicke and Wurzel 2019) and via transnational relations (e.g., Busch and Jörgens 2005; Pacheco-Vega 2015).

In this sub-section, I describe the analytical relationship of policy leadership relative to the concepts of policy diffusion, policy transfer, policy convergence, and isomorphism. I then discuss three competing definitions of policy leadership, as well as broad tendencies in their use in practice.

2.1.1 Placing policy leadership in context

A broad range of scholars have engaged with the subject of policy development, generating an array of concepts that are related to, but distinct from, policy leadership. Governments act as *policy leaders* if they tend to quickly adopt policies and influence the adoption of those policies by other governments. Policy leaders affect policy change in other jurisdictions by shaping macro-level *policy diffusion* processes, in which policy decisions are systematically conditioned on the prior policy decisions of other governments (Gray 1973; Rogers 2003; Simmons and Elkins 2004), and micro-level *policy transfer* processes, in which specific ideas are communicated and adapted to the follower state's context (Rose 1991; Dolowitz and Marsh 1996, 2000). As a result, policy leaders and their followers experience *policy convergence*, with governments' respective policy portfolios becoming more alike (Holzinger et al. 2008a; Sommerer and Lim 2016), and even *isomorphism*, with institutions and cultures becoming more similar over time (DiMaggio and Powell 1983; Bennett 1991). Thus, policy leadership describes an organizational behavior that works through policy diffusion and policy transfer, resulting in policy convergence and isomorphism.

2.1.2 Existing definitions of policy leadership

Despite the clear analytical distinctions between policy leadership and its related concepts, the definition of policy leadership itself remains contested. At least three competing definitions of policy leadership have emerged. These definitions differ in their relative emphasis and stipulations on policymaker intent and behavior, the normative content of policies adopted, and the specific mechanism by which leaders influence their followers. I present and assess each of these conceptualizations in turn.

The first definition proposes that states are leaders if they display high ambition in policy development both in domestic policy and in international fora, such as the European Union (Lieberink and Andersen 1998; Wiering et al. 2018). On the domestic level, ambition is often equated with stringent policy (Wiering et al. 2018), but some authors also view being the first to adopt policies as an indication of ambition (Lieberink and Wurzel 2017). At the international level, ambitious states play an active, visible role and attract followers, although there is some inconsistency as to whether leader states simply need to have followers (Jänicke and Wurzel 2019) or must actively seek to attract followers (Lieberink and Wurzel 2017; Wurzel et al. 2017). This ambition-based definition is commonly used in analyses that explicitly aim to identify instances of policy leadership.

Defining policy leadership in terms of internal and external ambition is problematic on both empirical and theoretical grounds. It is exceedingly challenging to measure a country's ambition or intent in a systematic way because what is beneficial for the environment is often contested (Lieberink and Wurzel 2017). As Knill et al. (2012a) observe, biofuels are promoted as a way to reduce fossil fuel consumption but may be seen as an irresponsible use of arable land. Similarly, nuclear energy can be framed as a renewable energy source useful for mitigating climate change or as an unsafe, expensive, and non-renewable source of energy. Understanding a country's intentions or ambitions would seem to require knowing the inner mental states of policymakers, a task so difficult as to lead even scholars working within this framework to acknowledge, "Clearly, there is a normative dimension involved in defining what constitutes an environmental leader" (Lieberink and Wurzel 2017, p. 953). If leaders can be identified through observable

behaviors—decisive action and influence over the behavior of others—there is no need to resort to subjective judgments.

Measuring policy leadership using ambition is also flawed on theoretical grounds. Ambition speaks to a government's intent, not the extent to which its plans are brought to fruition. From this perspective, it does not matter if a country is successful in attracting followers so long as it attempts to do so. But focusing on intent, rather than behavior, does not align well with the idea that a leader is defined, at least in part, by having followers ([Andresen and Agrawala 2002](#); [Torney 2019](#)). Simply attempting to attract followers, without regard to the success of those efforts, is not sufficient grounds to be called a leader. Further, it is unnecessary to limit external ambition to policymaking in international fora, as doing so overlooks bilateral influence relationships. A more minor criticism is that if policy adoption is to be considered, being early to adopt a policy would seem to speak more directly to the concept of internal policy ambition than being the first to adopt a policy.

The second definition of policy leadership holds that leader states enact the most stringent policies and, as a result, set an example that other states emulate ([Andersen and Liefferink 1997](#); [Jänicke 2005](#)). This definition has been widely used in studies of policy convergence (e.g., [Liefferink et al. 2009](#); [Knill et al. 2012a](#); [Sommerer and Lim 2016](#)). For subject areas like the environment, this definition aligns well with the idea that leadership is about solving problems and attracting followers ([Andersen and Liefferink 1997](#)). Moreover, in contrast to ambition, stringency is often straightforward to operationalize, especially in the context of pollution or manufacturing.

This definition has two weaknesses. First, it conflates decisive action with a high level of stringency, overlooking the potential impact of policies that cut regulatory stringency. Second, this definition suggests that there are no leaders in a race to the bottom, a dynamic in which states lower the stringency of their policies and, in doing so, inspire others to do the same ([Drezner 2001](#)). In fact, any policy can be emulated, regardless of its stringency or even its effectiveness ([Weyland 2005](#); [Marsh and Sharman 2009](#); [Shipan and Volden 2021](#)). For example, anti-money laundering policies spread rapidly around

the world despite questionable evidence of their effectiveness (Sharman 2008).

The third definition of policy leadership asserts simply that a policy leader is a jurisdiction from which other jurisdictions draw lessons (Pacheco-Vega 2021). This view is particularly amenable to the policy transfer literature in its emphasis on lesson-drawing (Rose 1991; Dolowitz and Marsh 1996, 2000). It also discards stipulations regarding the intent or stringency of the leader’s policies. However, restricting leadership to the phenomenon of lesson-drawing rules out leadership through other means, such as cooperative harmonization (Knill et al. 2012a). It is also incomplete because the definition does not articulate expectations for leaders’ domestic policymaking behavior, such as being on the cutting edge of policy development.

2.1.3 Trends in the study of policy leadership

Looking beyond specific definitions of leadership, there is widespread agreement that countries may vary in their policy leadership across topics and over time.¹ Nevertheless, and regardless of the underlying definition used, existing analyses display a “striking persistence of stereotypical classifications” (Knill et al. 2012a, p. 37). In the context of environmental policy, for example, scholars have asserted as common knowledge that:

- Austria, Denmark, Finland, Germany, the Netherlands, the United Kingdom, Sweden are leaders
- Belgium, France, and Italy are middling
- Greece, Portugal, Spain, Ireland, and Mexico are laggards
- Eastern European states were laggards but have improved
- The United States and Japan were leaders but have since reduced their policy leadership.²

¹For variation across topics, examples include Héritier (1995), Andresen and Agrawala (2002), Weidner (2002), Jänicke (2005). For variation over time, examples include Andresen and Agrawala (2002), Jänicke (2005), Szarka (2006), and Holzinger et al. (2011).

²See, e.g., Liefferink and Andersen (1998), Jänicke (2005), Liefferink and Wurzel (2017), and Weidner (2020). These claims are summarized in Knill et al. (2012a).

Conclusions such as these are often justified with anecdotes, but when scholars do attempt to support their claims with more systematic evidence, they typically rely on single-country case studies. For example, [Wiering et al. \(2018\)](#), [Hysing \(2014\)](#), and [Dyrhaug \(2020\)](#) examine the trajectory of environmental policy leadership in the Netherlands, Sweden, and Denmark, respectively, while [Steinbacher \(2018\)](#) explores the international consequences of German leadership in renewable energy policy. Some scholars also consider policy leadership in the context of pairs or small groups of countries. [Héritier \(1995\)](#) compared German and British air quality policy and, in a rare study on countries beyond Europe, [Steinberg et al. \(2001\)](#) examined environmental policy leadership in Costa Rica and Bolivia. Single-country case studies can be informative, but do not speak to the extent to which relationships identified in the case hold elsewhere.

There are only a handful of studies that conduct relatively large-N quantitative studies of policy leadership. These analyses operationalize the concept in terms of the number of policies adopted, the speed of policy adoption, and, most frequently, policy stringency.³ A shortcoming across these quantitative approaches is that they only measure decisive action, the internal component of leadership, and entirely omit measures of the extent to which countries attract followers, the external component of leadership.

2.1.4 Summary of existing work on policy leadership

Reflecting the challenging nature of the concept, scholars have proposed multiple competing definitions of policy leadership, each with respective strengths and limitations. Definitions that rely on ambition force the analyst to make subjective judgments about policymaker intent. Stringency-based definitions overlook the potential for leader states to set bad examples. Definitions that define leaders simply as sources of lesson-drawing are simultaneously overly restrictive, by excluding intentional efforts to create interdependent policymaking, and overly broad, by omitting consideration of domestic policymaking behavior. In practice, scholars have been quick to make broad judgments about countries' policy leadership, failing to differentiate policy leadership across topics

³Relevant studies include [Holzinger et al. \(2008b\)](#); [Lieberink et al. \(2009\)](#); [Holzinger et al. \(2011\)](#); [Knill et al. \(2012a\)](#); [Sommerer and Lim \(2016\)](#).

and time, often without systematic evidence. While there is a robust and growing set of case studies and small-N studies, there have been relatively few attempts to systematically measure and explain policy leadership across countries, and none of those that have been conducted have explicitly incorporated both the internal and external components of leadership.

2.2 Policy leadership: Innovation and influence

In this section, I propose a new, theoretically-robust definition of policy leadership. I start from general definitions of leadership and then move from individual-level understandings of leadership in policymaking to an institution-level understanding of policy leadership. I then articulate how this new conceptualization of policy leadership can be applied for systematic empirical analysis.

A commonly accepted understanding of leadership presents leaders as actors who take decisive actions that inspire others to follow (Helms 2012). That is, leadership is a combination of behaviors involving both a leader and their followers (Torney 2019). Part of being a leader—taking decisive action—is within the actor’s control, but another, critical component of leadership—the inspiration of others—lies outside of the focal actor’s control. It is only if, upon observing the actions of the focal actor, others freely decide to become followers and engage in similar behavior themselves, can an actor be called a leader. A leader without followers is no leader at all.

This understanding of leadership typically operates at the level of individuals rather than organizations (Kingdon and Stano 1984). In the context of the policymaking process, individual leadership in policy change takes four distinct, but related forms.⁴ First, individuals can act as *intellectual* leaders, injecting new ideas into the political debate. These ideas may be new policy paradigms (e.g., taxing pollution), policy instruments (e.g., carbon taxes), or policy settings (e.g., carbon taxes at \$50 per ton) (Hall 1993). Second, individuals can act as *instrumental* leaders, attracting attention and support to

⁴This typology is from Andresen and Agrawala (2002) and is based on Young (1991), Young (1998) and Underdal (1994).

policy ideas (Underdal 1994).⁵ The third type of individual-level leadership is *structural*, in which people use power to shape the incentives of others to facilitate the incorporation of a select number of these ideas into formal law. The fourth and final form of individual-level leadership is *directional*, encouraging policymakers in other jurisdictions to adopt analogous policies.

Instead of focusing on the actions of specific individuals involved in the policymaking process, leadership in public policy can also be understood at the institutional level. The habitual exercise of leadership by individuals embedded in incentive structures consisting of rules and norms results in patterns of organizational behavior. Intellectual, instrumental, and structural leadership affect the internal policymaking process by influencing, respectively, the rate at which new ideas enter, rise up, and are selected from the political agenda. Tracing intellectual and instrumental forms of leadership is important for understanding the spread and evolution of a policy idea. However, intellectual and instrumental leadership are challenging to observe directly because they tend to lead to changes in discourse and attitudes. The latent consequences of intellectual and instrumental leadership stand in contrast to structural and directional leadership, which manifest in the formal, public behavior of policy adoption by the leader institution and its follower institutions.

This discussion motivates a reconceptualization of policy leadership that comprises an internal component of decisive action through the exercise of structural leadership and an external component of inspiration of followers through directional leadership, all while remaining firmly rooted in intersubjective observation. Accordingly, I propose the following definition:

Policy leadership is the practice of 1) rapidly adopting new policies and 2) substantially influencing the diffusion of new policies.

This definition aligns closely with the general understanding of leaders as political actors who take decisive actions that inspire others to follow (Helms 2012). It defines

⁵The instrumental form of individual-level leadership is also sometimes referred to as policy entrepreneurship Mintrom and Vergari (e.g., 1996).

policy leadership as an institutional behavior consisting of an internal and external component. The internal component of policy leadership is decisive action through structural leadership, resulting in the increased likelihood and speed with which a policy is proposed, negotiated, and successfully enacted (Young 1998). The observable implication of the internal component of policy leadership is that policy leaders display greater policy innovation, adopting new policies more quickly than other governments (Boehmke and Skinner 2012). The external component is the inspiration of others through directional leadership, resulting in the increased likelihood and speed with which policies are enacted in other jurisdictions. The observable implication of the external component of policy leadership is that policy leaders should be more likely to form persistent leader-follower relations with policymakers in other jurisdictions (Torney 2019). Importantly, governments are not leaders if they are *only* innovative or *only* influential. A policy leader must simultaneously combine both of these elements.⁶

With this definition in hand, several observations and clarifications are in order. First, the new definition echoes existing work by characterizing policy leaders as being among the first to adopt new solutions (Andersen and Liefferink 1997) and attracting followers (Liefferink and Wurzel 2017; Wurzel et al. 2017; Jänicke and Wurzel 2019). But unlike ambition-based conceptualizations, it does not force the analyst to make subjective judgments about the intentions of policymakers (Liefferink and Wurzel 2017). Nor does it place any stipulations on the qualities of the policies a government adopts, unlike stringency-based conceptualizations (Knill et al. 2012a). Instead, the definition emphasizes the speed with which new policies are enacted once they become available, a judgment amenable to intersubjective observation. Moreover, rapid policy adoption requires the dedication of human and financial resources toward policymaking on a given topic, aligning well with the literature’s insistence on “high ambition” (e.g., Wiering et al. 2018) without requiring judgments about the normative value of the policies adopted. The external component of the definition also improves on lesson-drawing-based definitions (e.g., Pacheco-Vega 2021) by articulating the leader’s effect on the outcome (policy

⁶For example, a factor that predicts whether a country is innovative without providing insight into whether it is influential would only help distinguish laggards and influencers from inventors and leaders.

change) rather than the mechanism, which may be a coordinated or uncoordinated form of policy diffusion.

Of course, while my definition addresses many of the deficiencies in the existing literature, it has its own limitations. One of these limitations is that countries can affect policymaking in other countries by intentionally or unintentionally slowing or even preventing the spread of a policy across jurisdictions. For example, a government skeptical of climate change may encourage others to delay taking action to mitigate their greenhouse gas emissions. While this could be expected to be relatively rare—promoting a watered-down version of a policy would seem more likely than simply remaining silent on an issue—it is certainly possible.⁷ The definition I propose only considers positive influence (in the sense of increasing the likelihood of policy adoption), but future work should engage with countries that exercise influence by slowing the adoption of policies.

Second, it is key to note that policy leadership manifests as a persistent state behavior (Bernstein and Cashore 2000). Leader states do not adopt and spark the diffusion of just one policy (Underdal 1994). Instead, policy leaders engage in a pattern of behavior in which they are frequently among the first to adopt new policies and form leader-follower influence relationships that persist over time. Policy leaders are engaged in ongoing interactions with their followers, even as the personnel who work in these institutions change. This perspective recognizes that the rules and norms of institutions have an effect on politics that goes beyond simply aggregating instances of individual leadership in policymaking (Simon 1947; March and Olsen 1984). Policy leadership treats episodes of individual leadership as manifestations of a long-running, slowly evolving relationship, rather than a series of independent events.

Third, as in other conceptualizations of policy leadership (e.g., Knill et al. 2012a; Sommerer and Lim 2016), the behavior of interest in this context is policy adoption, not policy implementation or effectiveness. While policies could be more likely to spread if they are successfully implemented, policies could also spread because policymakers learn that simply adopting these policies without implementation eases other pressures. For

⁷Underdal (1994) contests this negative view of leadership, claiming that leadership only describes actions that enhance the actions of other actors toward a particular goal.

example, policy leaders could acquire followers precisely because they adopt policies that satisfy some external requirement (e.g., qualifications for financing from the International Monetary Fund), whether or not those policies are actually implemented (Mukherjee and Singer 2010). Moreover, policy effectiveness depends not only on government action but on social and economic conditions that also shape behavior, rendering effectiveness a frequently noisy indicator of policy leadership (Holzinger et al. 2008a; Knill et al. 2010).

Fourth, policy leadership is a dynamic behavior that evolves over time (Knill et al. 2012a) and across issue areas (Andresen and Agrawala 2002). Critically, policy leadership is also relative to a specific reference group. This reference group may be a specific set of peer governments (Holzinger et al. 2011; Steinberg et al. 2001), all governments within a given region (Andersen and Liefferink 1997; Vogel 2018; Jänicke and Wurzel 2019), or the entire world (Kim and Cha 2004; Torney 2019). Of course, these scope conditions have implications for the data necessary to test claims regarding policy leadership. If an analyst wants to consider policy leadership on a wide set of topics at a global level, their data must include data on the adoption of policies from each of these topics by all countries in the world.

Finally, although the incentives for environmental policy leadership generally favor enhanced environmental protection, acting as a policy leader is not necessarily a good outcome. By viewing policy leadership as a behavior, rather than adherence to a moral or ethical standard, innovative and influence policymakers may nevertheless take actions that are in fact harmful to the resolution of social problems or attainment of social goals (Nye Jr 2008; Lipman-Blumen 2005). This perspective is particularly useful in the environmental context, a policy domain in which there are ongoing debates over the merits of technologies like biofuels and nuclear power (Knill et al. 2012a).

2.3 Understanding policy leadership from a network perspective

Policy leadership consists of an internal component—innovation—and an external component—influence. Since countries can be stronger on one of these components than the other, it is helpful to combine these two dimensions into a typology describing the ideal-type roles governments can play in policy development (Table 2.1).⁸ Governments that are both highly innovative and highly influential are *leaders*, frequently adopting new environmental policies and attracting widespread attention for doing so. Countries that are neither especially innovative nor influential are policy development *laggards*. In these countries, environmental policies are enacted long after their invention, and their adoption goes largely unnoticed by the rest of the world. Countries can also occupy intermediate positions (Andersen and Liefferink 1997). A country that is inventive, but generally fails to convince policymakers elsewhere to follow its example is an *inventor*, while an *influencer* is a government that rarely invents new policies, but once it adopts a policy, it exerts a strong influence over the policy’s subsequent diffusion. Countries can move from one cell in this typology to another over time. As I argue in Chapter 3, one reason countries move across this typology is due to transnational advocacy.

Table 2.1: Ideal-type roles for governments in policy development

Innovativeness	Influence	
	Low	High
High	Inventor	Leader
Low	Laggard	Influencer

It is worthwhile to note that the opposite of a leader in this typology is not a follower, but a laggard. Laggards are slow to take up new ideas and their actions do not inspire others to do the same. If many countries are laggards, it suggests that countries are not communicating effectively with each other and are not responding quickly to the advent of new policy ideas. If policy leadership were to become more prevalent, then countries

⁸This typology is inspired by (Liefferink and Wurzel 2017).

would follow each other's actions more attentively and act more quickly in response to each other. As noted in the previous section, whether this dynamic leads to normatively better outcomes depends on the specific policy content (often policy settings) and the analyst's priorities and values.

2.3.1 Measuring innovation

Innovativeness is the tendency for a state to adopt new policies sooner than other states. While being the first to adopt a policy is to invent the policy, policy innovation is the first time a given policy is adopted in a particular jurisdiction ([Walker 1969](#)). This perspective emphasizes a policy's spread or entry into wider use, rather than its initial moment of creation (invention) or subsequent effects (evaluation) ([Jordan and Huitema 2014](#)). Importantly, a government with a high rate of innovation is not necessarily adopting good or important policies. Instead, a high rate of environmental policy innovation indicates that government policymakers have decided to devote a larger portion of their time and effort to environmental issues—for better or for worse.

As per [Boehmke and Skinner \(2012\)](#), innovativeness can be measured as a rate representing the proportion of policy adoption opportunities that a country takes advantage of during a period of time. Innovativeness is a unit-level attribute that can be measured directly, making comparisons between units straightforward. For example, if country A enacts a higher proportion of unadopted policies in a given time period than country B, then country A is more innovative than country B.

This approach to measuring innovation requires three assumptions. The first is that all policies are assumed to be equally difficult to adopt. This assumption is unlikely to be strictly true in practice, especially for transformational, costly, or cross-cutting policies. One way to test the extent to which policy complexity matters is by varying the weight afforded to the adoption of more complex policies.

The second assumption is that the adoption of each policy is independent within a jurisdiction. This assumption is also unlikely to be strictly true, as the adoption of one policy may substitute for the adoption of another. Such adoptions may be a

direct substitution in the pursuit of a single policy goal. For example, the adoption of renewable portfolio standards is known to substitute for the adoption of feed-in tariffs for renewable energy (Busch and Jörgens 2005). Alternatively, policies may be indirect substitutes via opportunity cost, with the adoption of one policy diminishing or enhancing the effectiveness or desirability of another policy. This assumption can be addressed in analyses of a small number of policies by explicitly accounting for the interdependencies between policies. However, these interdependencies can be challenging to identify when studying many policies, but if each policy's adoption is thought to affect only a small number of other policies, the bias generated by these interdependencies should decrease as the number of policies studied increases.

The third assumption is that all states have at least a non-zero possibility of adopting any policy instrument. One approach to addressing this problem is to examine each policy and determine whether some states would never adopt them and then omit those observations. This strategy is attractive on its face but challenging to implement systematically. For example, although elephants are not native to the United Kingdom, it is still illegal to kill elephants for sport. Similarly, a landlocked country can register ocean-going vessels. An alternative approach described by Boehmke and Skinner (2012) is to take a probabilistic approach, assuming that each state has some probability of being able to adopt any given policy. I take the position that there are few, if any, policies that a given government would simply never adopt, although there may be variation in each government's underlying probability of adopting policy instruments, an idea that could be in statistical terms by, for example, country-level random effects.

2.3.2 Measuring influence

Influence describes the prevalence with which a government enters into leader-follower relationships as the leader. A leader-follower policymaking relationship describes a persistent interdependence in the policymaking of two governments, indicated by a pattern in the timing of policy adoptions in which an adoption by the leader government tends to be followed shortly thereafter by the same policy's adoption by the follower

government. Influence is a relational attribute, meaning that a given country’s influence provides a summary of that country’s dyadic relations.

Estimating an individual government’s influence is a two-step process. The first step is to detect a government’s persistent leader-follower influence relationships. I infer these relationships from patterns in the relative timing of adoptions across multiple policies using the *NetworkInference* (NetInf) algorithm described in [Desmarais et al. \(2015\)](#).⁹ The intuition underlying the NetInf algorithm is that when a leader-follower influence relationship exists between two countries, the adoption of policies by the leader should persistently predict the adoption of a similar policy by the follower shortly thereafter. For a given point in time and relative to a specific set of policies, the existence of a leader-follower influence relationship can be represented as a directional edge between the two country nodes in the network, forming a directed dyad. To illustrate, if France adopts policies just before the United Kingdom time and again, the NetInf algorithm would indicate that France acts as a policy leader to the United Kingdom.

The second step is to summarize each country’s leader-follower relationships to make comparable measurements. Since the concept of influence describes a tendency to lead other countries, I measure policy leadership as the number of dyadic relations in which the government is the leader node. This statistic corresponds to the network measure out-degree. For example, country A is more influential than country B if country A is a leader in more leader-follower influence relationships than country B.

There is an inherent relationship between innovation and influence because a government cannot generate a pattern of policy adoption with other countries if it never adopts any policies itself. However, for any country with non-zero policy adoptions, the mechanistic relationship between innovation and influence weakens because the NetInf algorithm includes a penalty for a lack of precision in the leader’s prediction of policy

⁹The NetInf algorithm ([Gomez-Rodriguez et al. 2012](#); [Desmarais et al. 2015](#)) creates a network in which the policy-adopting units are nodes and iteratively adds directed edges to the network that make the largest improvement in the likelihood of a constrained maximization problem consisting of 1) maximizing the number of times government i adopts policies before government j , 2) minimizing the amount of time between government i ’s adoptions and government j ’s adoptions, and 3) maximizing the precision with which government i ’s adoptions predict government j ’s adoptions. See [Desmarais et al. \(2015\)](#), as well as [Gomez-Rodriguez et al. \(2012\)](#), the original creators of the NetInf algorithm, for more details on the algorithm and the accompanying network inference procedure.

adoption by the follower, accounting for jurisdictions that have a high rate of policy innovation for internal reasons.

2.3.3 Calculating policy leadership

Combining the two attributes, the policy leadership of a government, $Leadership_i$, is a function of its innovativeness, $Innovativeness_i$, and a statistic summarizing its influence over other governments, $g(Influence_{i \rightarrow j})$.¹⁰ More succinctly:

$$Leadership_i = f(Innovativeness_i, g(Influence_{i \rightarrow j}))$$

The function $f()$ combines the measures of innovation and influence into a single leadership score. The functional form of $f()$ depends on the analyst's weighting of innovation relative to influence. I opt to multiply innovation and influence together using equal weights because both are individually insufficient and jointly necessary for environmental policy leadership.

2.3.4 Representing policy leadership in a network graph

Using the typology of ideal-type roles as a point of departure, the components of policy leadership, innovation, and influence are amenable to representation in a network graph, facilitating the construction of measures that are comparable between and within units while remaining firmly rooted in intersubjective observation. In a policy leadership network, the nodes are governments and the edges are leader-follower influence relationships. A government's policy leadership is then a function of its innovativeness (a nodal attribute) and a summary of its leader-follower influence relationships.

The main benefit of viewing policy leadership through the lens of network analysis is to capture the close relationship between a country's domestic policymaking, or nodal attributes, and its influence on other countries, represented through the existence (and potentially attributes) of directed edges to and from other nodes. A network perspective

¹⁰Since influence is a dyadic concept, it requires a summary statistic for use at the individual (government) level.

also brings to the fore the fundamentally relational nature of influence between a leader and its followers, allowing the researcher to measure and explain variation in the interdependence in different countries' policymaking processes. By turning to network analysis, I link the literature on policy leadership with other work on the role of networks in policy change, in which the analysis of network graphs provides insight into the factors that predict individual-level leadership in policymaking (Ingold and Leifeld 2016; Arnold et al. 2017), the formation of leader-follower relationships in policy diffusion (Desmarais et al. 2015; Boehmke et al. 2020), and the factors that predict followership (Torney 2019).

Figure 2.1 provides an example of a policy leadership network in which four countries (A, B, C, D) are represented as nodes in a graph. The innovativeness of each country is represented as the size of each node, with more innovative countries (A, D) being larger than less innovative countries (B, C). Each leader-follower influence relationship is represented by a directed edge linking the leader and follower countries. In this example, country A influences policymaking in countries B and C and country C influences policymaking in countries B and D. Note that, even though there are no reciprocal edges in Figure 2.1, mutual relationships are both possible and perhaps to be expected.

By construction, each of the four countries in this example falls into one of the four ideal-type roles described above. Country A is a leader due to its high innovativeness and, as the leader in leader-follower relationships with two other countries, high influence. Country B is a laggard, as it has low innovativeness and influences no other country's policymaking. Country C, with low innovativeness but a high amount of influence, plays the role of an influencer. Country D is an inventor, quickly adopting many policies but influencing no other countries in the policy leadership network.

2.4 Conclusion

This chapter starts from the premise that leadership is the combination of decisive action with the inspiration of others. Despite substantial and enduring scholarly attention (or, perhaps because of it), there does not yet exist a consensus definition of policy

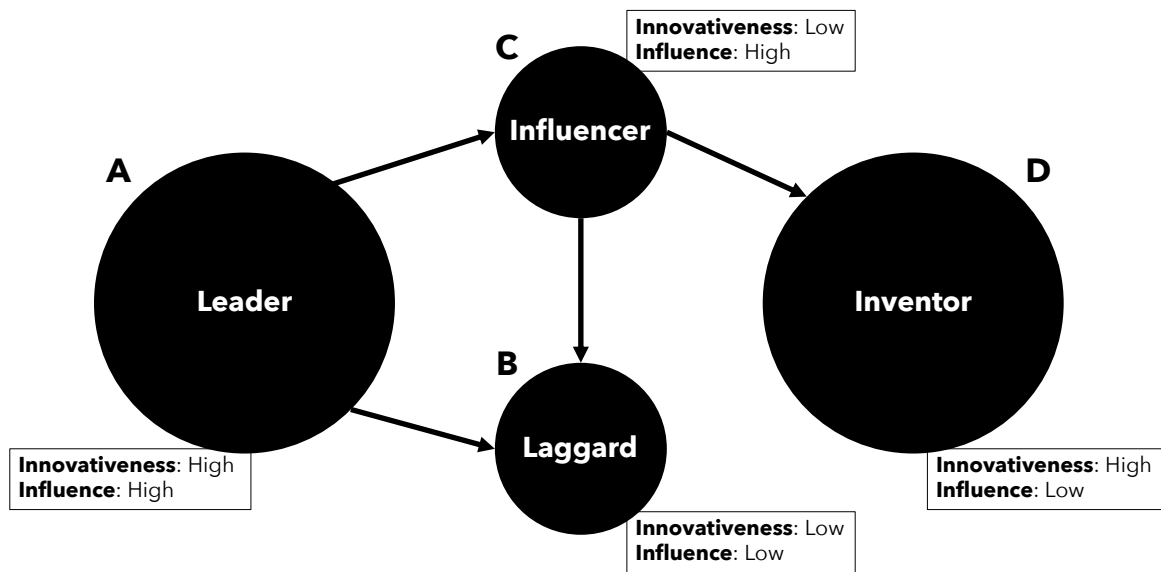


Figure 2.1: Example policy leadership network for four countries.

Larger nodes indicate more innovative countries. Directed edges indicate the presence of a leader-follower influence relationship. Influence is calculated as the number of out-directed edges (out-degree).

leadership. Existing definitions force scholars to rely on subjective judgments, rule out normatively bad forms of leadership, and unnecessarily restrict the mechanisms by which leaders may influence their followers. To address these shortcomings, I propose a new conceptualization of policy leadership consisting of an internal component—rapid policy adoption—and an external component—widespread influence on the diffusion of new policies. This definition aligns with the analytical thrust of existing work on policy leadership while emphasizing the concept’s empirically-based, value-neutral roots. Finally, I convert the internal and external components into the language of network analysis, providing a straightforward approach for creating a systematic and comparable measure of environmental policy leadership.

Chapter 3

Transnational Environmental Advocacy as a Catalyst of Policy Leadership

Of the international factors that affect policy change, one of the most important is transnational communication. Unlike international agreements, which are often weakened and delayed by the need for consensus (Barrett 2005), it is relatively straightforward to communicate policy ideas across national borders. Policymakers can learn about other countries' policies through direct interactions with their peers or via indirect channels brokered by go-betweens (Graham et al. 2013), who are often transnational advocacy organizations. Direct interactions can be meaningful drivers of policy change (Kammerer and Namhata 2018), but relative to indirect channels of transnational communication, face-to-face exchanges between empowered policymakers—rather than negotiators—tend to be infrequent, superficial, and thematically constrained, typically revolving around issues posing international cooperation problems.

In this chapter, I focus on the indirect channel of transnational communication, proposing a new theory of how and why transnational advocates act as drivers of environmental policy leadership. I first define transnational advocacy and discuss in general terms the emergence of transnational advocates, their range of organizational structures, and what these advocates seek to achieve. Next, I build on the conceptualization of environmental policy leadership described in Chapter 2 by providing an overview of pol-

icymakers' incentives for environmental policy leadership, followed by a novel theoretical framework composed of the three primary types of strategies transnational advocates have at their disposal for affecting policy change. I then lay out a set of hypotheses regarding the effect of transnational environmental advocacy on policy leadership, as well as my expectations about the circumstances under which these advocates' efforts are most likely to be successful. I conclude the chapter by focusing on the three most visible types of transnational advocates: international environmental NGOs, international development organizations, and multinational corporations. For each actor, I outline their interactions with policymakers, explain how I measure their environmental advocacy activities, and present data describing their advocacy activities across countries and over time.

3.1 The what and the why of transnational advocacy

Transnational policy advocates work across multiple countries to promote the adoption and implementation of favored policies at the domestic and international levels. While individuals can engage in transnational advocacy, most choose to work within organizations to leverage institutional resources (Haas 1992). To better understand transnational advocacy, it is critical to consider how these transnational advocacy organizations are structured, what they seek to achieve, and how they relate to domestic policy advocates.

3.1.1 What transnational advocates seek to achieve

There is a long history of people and organizations engaging in transnational advocacy. Perhaps the earliest multinational corporation was the East India Company, which engaged with local governments across the Indian subcontinent and elsewhere on trade, manufacturing, and tax policy (Clegg 2017). As early as the 18th century, a transnational advocacy network of Quakers coordinated anti-slavery campaigns in the United States and the United Kingdom (David 2007). Transnational advocacy has rapidly expanded in recent years, thanks in large part to modern forms of communication and the proliferation of international conferences that have lowered the cost of international networking (Keck

and Sikkink 1998).

Despite these developments, transnational advocacy is not always a major force on all issues. Transnational advocacy tends to be more common for issue areas with high stakes and high uncertainty, typically involving moral values, such as human rights (Risse-Kappen et al. 1999) and violence against women (Keck and Sikkink 2014; Montoya 2013), or externalities, such as the environment (Pellow 2007; Pacheco-Vega 2015). Multinational corporations may also be more likely to engage in transnational advocacy on issues of trade, property rights, and regulations affecting their suppliers and customers (Kim et al. 2019). In contrast, technical or peripheral issues may be dealt with primarily through domestic processes, with little engagement from transnational advocates.

Transnational advocacy, like all policy advocacy, consists of two stages. In the first stage, advocates seek to draw the attention of policymakers to the existence and urgency of a problem and place it on the political agenda. Kingdon (1993) describes this process as akin to surfers looking for a wave (typically, a focal event) to ride. When one comes along, activists “paddle” to catch the wave’s momentum using a range of tactics, from confrontational public campaigns and demonstrations to more collaborative lobbying and capacity-building workshops. Having caught the attention of policymakers—legislators, regulators, or judges (Holburn and Vanden Bergh 2004)—advocates seek in the second stage to shape the design, formation, and implementation of policies on their issues of interest (Rietig 2016). In this setting, policy advocates seek to define the menu of policy alternatives for time- and resource-limited policymakers and push for the selection of their preferred options (Mintrom and Vergari 1996).

3.1.2 The organizational structure of transnational advocates

Transnational policy advocates define priorities and implement advocacy strategies in multiple political contexts at the same time. Operating in a variety of jurisdictions provides an opportunity for broad influence, but doing so risks incurring potentially high coordination costs. To lower these costs, transnational advocacy organizations share labor, funds, and information across national borders. The manner and extent to which

a given organization coordinates its activities across jurisdictions depend on where its structure falls on a spectrum ranging from centralized to dispersed. Figure 3.1 summarizes these differences.

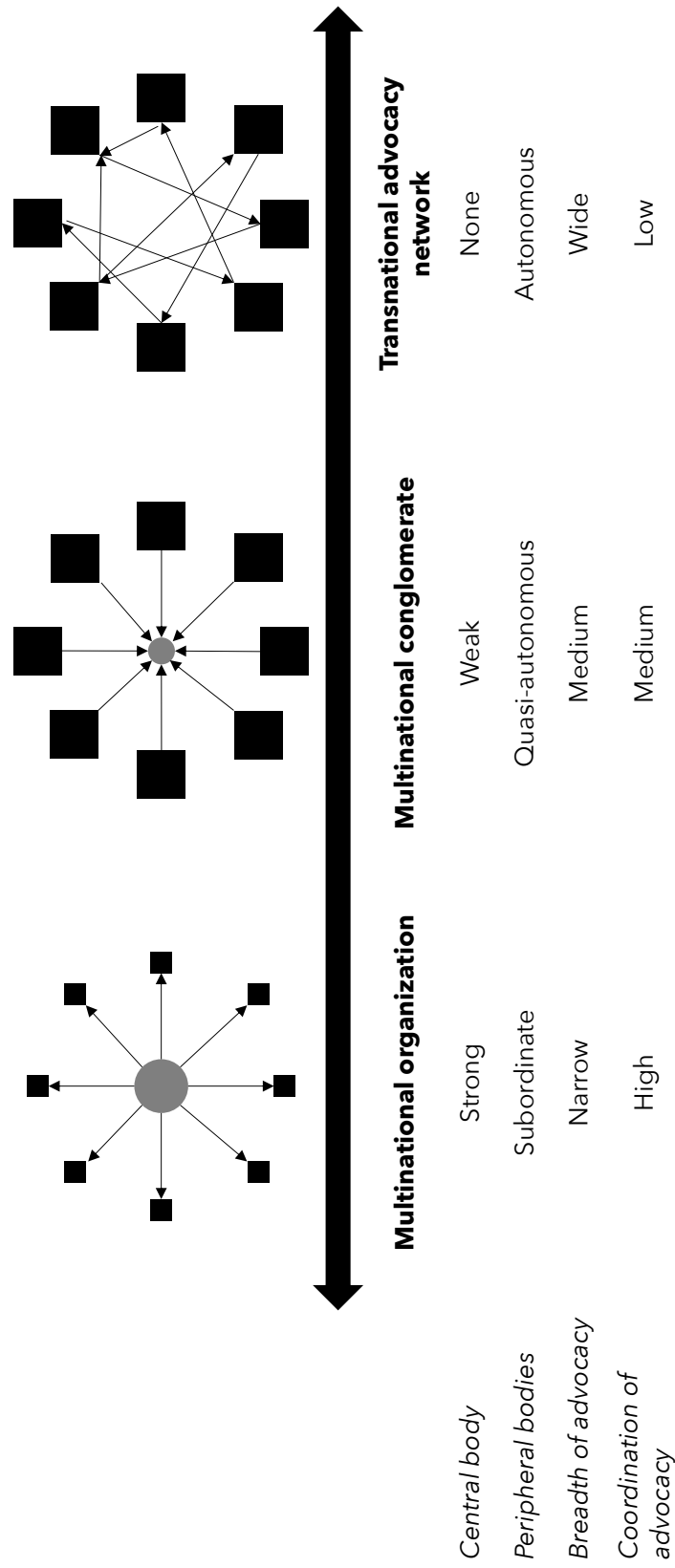


Figure 3.1: Types of transnational advocate organizational structures.

Structures fall on a spectrum from centralized (multinational organization) to dispersed (transnational advocacy network). Circles are central bodies, squares are peripheral bodies, and directed edges indicate the decisionmaking relationships.

At the centralized end of the spectrum, transnational advocates are embedded in a single multinational organization consisting of a strong central body and weak country-level representatives. These organizations may be established as for-profit enterprises (multinational corporations, e.g., The Coca-Cola Corporation) or as not-for-profit organizations (international NGOs, e.g., Conservation International). They may also be government or intergovernmental institutions, such as the United States Agency for International Development (USAID) or the World Bank. In all these organizations, strategic decisionmaking is largely centralized and subordinate peripheral bodies (i.e., the field) are primarily tasked with providing information and feedback to the center (i.e., headquarters). As a result, the advocacy efforts of centralized transnational advocacy organizations tend to be more targeted and the subject of extensive planning and coordination.

At a more moderate degree of centralization, transnational advocates work as multinational conglomerates. These organizations are structured with a weak central body and strong peripheral bodies. Corporate groups may be organized in this fashion, with corporate headquarters that delegate considerable authority to subsidiaries to such a point that they operate as quasi-autonomous firms. For example, the ice cream manufacturer Ben and Jerry's is an independently operating subsidiary of Unilever, a multinational consumer goods company. International NGOs, such as Greenpeace and Friends of the Earth, are also structured as multinational conglomerates. Multinational conglomerates determine a minimal overall strategy, often through a collaborative process with the active involvement of peripheral bodies. In practice, the central body delegates many decisions regarding advocacy to the organization's peripheral units, resulting in a wider array of advocacy with a modest degree of coordination.

At the dispersed end of the spectrum, transnational advocates work as individuals and organizations in political networks engaged in "voluntary, reciprocal, and horizontal patterns of communication and exchange" (Keck and Sikkink 1998, p. 91). These transnational advocacy networks (TANs) lack a central body, functioning as fluid and open collections of independent organizations. Some TANs have a formal designation,

such as the Climate Action Network, a network of more than 1500 NGOs from 130 countries,¹ while others are bound to each other only by shared values and informal patterns of resource exchange. Flexible and porous structures, TANs attract a diverse set of actors, from individual academics to domestic NGOs to multinational corporations, seeking to promote ideas, norms, and policies that align with their shared values and interests (Keck and Sikkink 1998). Zuin et al. (2019) describes an example of a TAN in action, finding that NGOs, donors, practitioners, and academics contributed to the spread of policies for integrated and community-led sanitation. The dispersed structure of TANs means that their members engage in a broad array of loosely coordinated advocacy activities.

Since my primary interest in this analysis is environmental policy leadership across the full domain of environmental policy, I aggregate the activities of individual transnational advocates within each type of actor. In so doing, I treat these organizations as components of broad, informal transnational advocacy networks, reflecting the predilection for similar organizations to coordinate and generate synergies while still allowing for variation in advocacy activities across type.

3.1.3 Comparing transnational and domestic advocates

Transnational and domestic advocates both seek to influence policymakers, but they differ in several ways. First, transnational advocates tend to be some of the most powerful actors in their sector. Multinational corporations tend to be the largest exporters, employ the most skilled workers, and be the most productive (Autor et al. 2020). Similarly, international NGOs hold a dominant position over domestic NGOs in terms of resources and access (Stroup and Wong 2017). Relative to international NGOs, “most of the domestic NGOs in the developing world are weak, poorly funded, and hardly autonomous catalysts of social change” (Longhofer et al. 2016, p. 1759). Consequently, transnational advocates would appear more likely to effectively exercise influence over policy change than domestic advocates.

¹<https://climatenetwork.org/>, accessed April 28, 2021.

The relationship between domestic and transnational advocates depends on the extent to which they share values and policy preferences. If domestic and transnational advocates share a common position, synergies may emerge, especially in the presence of “bilateral activists” capable of facilitating resource and information flows between transnational and domestic actors (Steinberg et al. 2001). For example, international NGOs design programs with the explicit intent of empowering domestic NGOs with aligned positions and helping them grow (Bernstein and Cashore 2012; Longhofer et al. 2016). This relationship can be reciprocal, as domestic advocates can also enhance the effectiveness of transnational advocates by providing legitimacy and adapting generic advocacy strategies to local conditions. However, if transnational advocates hold different policy preferences than domestic advocates, as is frequently the case for multinational corporations (Kim and Milner 2021), they may eschew cooperation with their domestic counterparts and compete with them for influence.

3.2 Policymaker incentives and disincentives for (environmental) policy leadership

To understand why policymakers act as leaders in policy development, and environmental policy in particular, I propose a theoretical framework that centers on the economic, political, and problem-solving incentive structures in which policymakers operate.² From an economic perspective, rapidly adopting environmental policies and influencing policy in other jurisdictions can reduce adjustment costs and increase macroeconomic stability (Vogel 1997). Environmental policy innovation also creates economic co-benefits in the form of employment, innovation, and productivity, as well as opportunities for growth through international trade via technology export and stronger comparative advantage in target markets (Héritier 1995; Jänicke and Wurzel 2019). Politically, policy innovation provides opportunities for policymakers to claim credit for being proactive (Harrison 1996), gain the esteem of their peers in other jurisdictions (Perkins and

²I focus in particular on environmental policy to make this discussion more concrete, but the incentives and disincentives discussed here apply generally.

Nachmany 2019; Busch and Jörgens 2005), and respond to policy demands from domestic constituencies (Lieverink and Andersen 1998; Pacheco-Vega and Murdie 2020) and from peers abroad (Perkins and Nachmany 2019; Busch and Jörgens 2005). In terms of problem-solving, policymakers may be genuinely motivated to ameliorate environmental problems, exploring the solution space for optimal policies, overcoming coordination problems inherent to transnational environmental problems, and even taking pleasure in developing creative approaches to addressing problems (Héritier 1995).

However, policy leadership, especially policy innovation, does not come without potential cost. Early policy adopters engage in trial-and-error when determining policy settings, experiences from which later adopters can benefit (Parinandi 2020). New policies can also be risky, with the potential for ineffectiveness or even failure—both in terms of solving problems and providing political utility. In addition, policy innovation requires human and financial resources, which are then not available for other purposes.

The costs of policy influence are less clear. While policy influence stems in part from self-promotion (which requires resources, including reputational resources), influence also comes from the learning and attention of other governments. Followers engage with leaders to minimize their economic risk and maximize economic, political, social, and environmental rewards (Torney 2019), as well as to reduce their search costs for effective policies (Busch and Jörgens 2005). If the benefits of following are too low, would-be leaders may fail to attract followers (Kushida 2011).

Whether the benefits of policy leadership outweigh the costs is an object of contention among advocates for and against changes to the status quo, as this perception determines political will for policy leadership (Héritier 1995; Jordan et al. 2003). When a government decides not to pursue policy leadership on environmental issues, they may re-allocate policymaking resources from environmental issues, for example by shrinking the staffing and budgets of environmental ministries. Governments may also alter their communications by removing references to environmental topics in their communications (Davenport 2017) or even explicitly declaring their desire to act as a laggard on environmental problems (Minnesma 2019). As described in greater detail in the following

chapter, political will, in combination with information and capacity, determines whether a country engages in policy leadership. If policymakers have sufficient information, are capable of leading, and perceive the benefits of doing so to outweigh the costs, they will pursue policy leadership. Otherwise, they will not.

3.3 Three levers connecting advocacy to policy change

Advocates have three types of strategies at their disposal to capture the attention and shape the decisions of policymakers: information, capacity, and political will. These strategies can be thought of as levers, or causal pathways that advocates selectively activate according to their strategic incentives and political context. Transnational advocates function similarly to domestic counterparts in their strategies and tactics for policy change (Keck and Sikkink 1999), so much of the following applies to both transnational and domestic advocates alike.

To activate the first lever, information, advocates capitalize on their expertise to inform policymakers about problems and policy solutions. Many advocates employ experts, both academics and experienced practitioners, who have specialized knowledge of social and physical processes, the relationships between these processes, and the likely consequences of policy alternatives (Haas 1992; Mattli and Woods 2009). These experts share their knowledge with policymakers via reports, educational workshops, and direct consultation to direct their attention to the existence of problems and an array of potential policy solutions. For example, the international NGO Oceana released a widely-publicized report in 2018 intended to sound the alarm about the practice of turning off ship-tracking devices before entering protected areas to conceal illegal fishing (Malakry and Lowell 2018). Policymakers often have too many demands on their time to develop deep factual knowledge about the problems they are tasked with solving, so expert reports like Oceana's provide a valuable service for policymakers by drawing attention to problems, simplifying complex decisions, defining policy alternatives, and explaining their relative costs and benefits (Mintrom and Vergari 1996).

To address the second lever, capacity, advocates work to build community and institutional capacity for policymaking. Moving beyond simply providing information, this approach aims to empower government policymakers by providing them with the human and financial capacity to design and implement policy. Policymakers in many countries may hesitate to enact complex policies, such as carbon pricing, if they lack sufficient emissions monitoring and reporting tools (Eliasch 2008). To overcome these deficits, advocates can transfer human and financial resources through grants and technical workshops. A complementary approach is to build the capacity of domestic advocacy organizations, strengthening these groups' ability to define their priorities, communicate their preferences, and hold recalcitrant policymakers to account (De Weijer and Kilnes 2012).

In rare instances, advocates may even be invited to directly embed themselves in government ministries. In Liberia, for example, the United Nations imposed an embargo on timber exports during the Second Liberian War to weaken the regime of Charles Taylor. At the end of the war, the United Nations agreed to lift the embargo if the newly-installed government of Liberia created a new forestry law. To ensure the law met international standards, the Government of Liberia invited the staff of an international NGO, the Environmental Law Institute, to help design and implement their framework forestry law.³ The sanctions were eventually lifted in 2006 following the enactment of the new forestry law (Xu 2006).

To trigger the third lever, political will, advocates design pressure campaigns to alter policymakers' incentives to devote time, staff, and political capital to a particular issue. These pressure campaigns may be pursued using the insider tactic of formal lobbying of policymakers to persuade them to bring their preferences into alignment (Brulle 2018). Although transnational advocates are often barred from lobbying because of their foreign legal status (Steinberg et al. 2001; Bernstein and Cashore 2012), they often create local subsidiaries or designate allies to undertake this task on their behalf (Lee 2020). An alternative approach is to wage an outsider campaign

³Interview on July 8, 2019 with Sandra Nichols Thiam, Environmental Law Institute

via public communications that place pressure on policymakers (Kollman 1998), often using confrontational naming-and-shaming tactics (Murdie and Davis 2012; Murdie and Urpelainen 2015) and boycotts (Bernstein and Cashore 2000). When advocates have limited direct access to policymakers, they may seek to mobilize external actors to bring pressure on policymakers via international channels (Keck and Sikkink 1998, 1999). An additional strategy available to advocates with sufficient resources, either individually or in coalition with others, is to promise to make investments or threaten to withdraw funding (Nye Jr 1974; Hunt et al. 2017; Pacheco-Vega and Murdie 2020). Insider lobbying tactics aim to persuade policymakers of the merit of advocates' opinions, while outsider tactics work indirectly, generating public support for advocates' positions (Kollman 1998).

The lever advocates decide to use depends on their organizational characteristics (e.g., type, structure, history), the characteristics of the target policymaker (e.g., preference alignment, resources, insulation from accountability), and the specific policy issue in question (e.g., uncertainty, scale, potential consequences). Advocates may coordinate their selection of tactics with others, with organizations adopting outsider tactics with the intent of increasing the influence of insider allies (Aunio 2012). Advocates may even use this insider/outsider strategy within a single organization. For example, organizations like Greenpeace frequently stage confrontational public demonstrations while simultaneously providing legal assistance to developing country governments at international climate change negotiations.⁴

It is important to note that policy advocates are not always in favor of policy change. In some instances, advocates instead want to convince policymakers to maintain the status quo. Advocates may believe that a proposal is inappropriately stringent or, conversely, insufficiently so. For example, opponents of policies mitigating climate change in the United States include not only corporations that directly emit large amounts of greenhouse gases, but also firms that buy and sell from carbon-intensive companies (Cory et al. 2021).

These three levers provide a theoretical foundation for understanding how advocates

⁴Interview on November 13, 2017 with Carroll Muffett, Center for International Environmental Law.

affect the policymaking process. It also provides the theoretical foundation for building insights into circumstances under which advocates should be more or less effective. Governments may be more sensitive to some levers than others – for example, vulnerability to international pressure affects the effectiveness of naming-and-shaming tactics (Murdie and Urpelainen 2015). Similarly, advocacy organizations have strategic repertoires that they tend to use across different contexts (Stroup and Wong 2017). This observation might lead to the expectation that, for example, advocates that prefer to work via the political will lever may be less effective in isolated countries like North Korea or Syria than organizations that use more collaborative strategies. While the three levers are available to transnational advocates of all kinds, organizational structures, histories, and missions may lead to variation in the use of different advocacy strategies across different types of transnational advocates.

3.4 Hypotheses and enabling conditions for successful transnational environmental advocacy

I anticipate that, in general, transnational environmental advocacy will catalyze environmental policy leadership. In this section, I lay out my expectations for the impact that international environmental NGOs, IDOs, and multinational corporations have on environmental policy innovation and the creation of leader-follower relationships in environmental policymaking. I then consider the conditions under which transnational environmental advocacy is likely to have a larger effect on environmental policy leadership.

3.4.1 Hypotheses

I anticipate that governments will tend to display more environmental policy leadership when there are more transnational environmental advocates present in a country because these advocates will provide more information, build more capacity, and engage in more pressure campaigns to raise political will. I also expect that governments will display

higher levels of environmental policy leadership when countries that share transnational environmental advocates in common have displayed higher levels of environmental policy leadership in the past. These hypotheses can be expressed as:

H1a: States should display higher levels of environmental policy leadership when transnational environmental advocates are more active.

H1b: States should display higher levels of environmental policy leadership when states with transnational environmental advocates in common display higher levels of environmental policy leadership.

Turning to the two dimensions of environmental policy leadership, I expect that governments will tend to adopt environmental policies more quickly—raising their rate of environmental policy innovation—when there are more transnational environmental advocates present in their country. This hypothesis is motivated by the idea that when there are more international environmental NGOs, IDOs, and multinationals present, there are more actors providing policymakers with information, empowering policymakers to enact policies, and attempting to convince policymakers to adopt advocates' preferred policies. This idea leads me to pose the following hypotheses:

H2a: States should be more innovative when more international environmental NGOs are active in that country.

H2b: States should be more innovative when IDOs provide more environmental ODA funding in that country.

H2c: States should be more innovative when multinational corporations engage in more environmental lobbying in that country.

Turning to environmental policy influence, I expect that countries will be more likely to form leader-follower influence relationships when they share more ties via transnational advocacy organizations. Transnational advocacy organizations need to be aware of policy changes across multiple jurisdictions to be effective ([Bernstein and Cashore 2012](#)) and, by way of their distinctive position of working in multiple jurisdictions at the same

time, transnational advocates are positioned to strategically stimulate policy diffusion between countries. More specifically, transnational advocates can activate dynamics of competition, learning, and socialization among policymakers by selectively sharing examples of policies enacted by their peers abroad (Busch and Jörgens 2005).

The examples that transnational advocates choose to share with policymakers will tend to be policies that align with their norms and values. Additionally, since advocates typically seek to shape governance outcomes, they may also favor policies that have a record of success in other jurisdictions. Even more pragmatically, given that advocates face their own cognitive constraints, they may be particularly likely to share policy examples in which their colleagues or peers work. Transnational advocates play a distinctive role in amplifying governments' international influence as go-betweens. Accordingly, I pose the following hypotheses:

H3a: The more international environmental NGOs two states share in common, the more likely they will be to develop a leader-follower influence relationship.

H3b: The more environmental ODA funding that flows between two states, the more likely they will be to develop a leader-follower influence relationship.

H3c: The more multinational corporations engaged in environmental lobbying two states share in common, the more likely they will be to develop a leader-follower influence relationship.

3.5 Enabling conditions for successful transnational environmental policy advocacy

With the expectations described above in mind, the effectiveness with which transnational advocates shape environmental policy is likely to depend on a variety of contextual factors. One set of factors is the economic and political conditions in which transnational advocates operate. It is not clear from the outset whether a country's wealth enhances

or diminishes transnational advocates' effectiveness. On the one hand, analysts have noted the importance of economic, human, and institutional capacity for environmental policy leadership (Jänicke 2005; Lenschow et al. 2005). On the other hand, transnational advocates may be more effective in poorer countries in which their expertise and resources allow them to make a larger marginal impact on policy debates (Rajwani and Liedong 2015; Desbordes and Vauday 2007). Poorer countries may also be more vulnerable to international pressure (Pacheco-Vega and Murdie 2020). Steinberg et al. (2001) notes it is "difficult to find a major conservation policy initiative of the past 35 years in [Costa Rica or Bolivia] that did not receive significant support from overseas" (12). Local political institutions also seem likely to matter, as they affect the strength of domestic civil society (Bernstein and Cashore 2012), the access external actors have to the policymaking process (Bonardi et al. 2005), and the difficulty with which policymakers can expropriate investments made by multinational corporations (Jensen et al. 2012; Choi et al. 2015). The existence of violent conflict may also matter for advocacy because it both makes it more challenging for advocates to engage in their activities and the opportunity cost of working on environmental issues (instead of, for example, security issues) may be higher for policymakers.⁵

Transnational advocates may also vary in their effectiveness from one environmental issue to another. Policymakers may be particularly open to engaging with transnational advocates on issues that often have strong links to international trade, such as forestry (Bernstein and Cashore 2012). Competition for influence over policy may be particularly fierce on issues that involve highly concentrated sectors, such as energy. Complex issues often struggle to capture the public's interest (Bonardi and Keim 2005), narrowing the set of constituencies that policymakers need to please and increasing the relative strength of interested parties. However, issue complexity is usually related to the number of topics it relates to, so more complex policies may require more veto players to agree and, due to the wide range of interests involved, opposition may be more likely to arise.

The third set of factors relates to the nature of the activities in which transnational

⁵Interview on June 24, 2019 with Susan Lieberman, World Conservation Service

advocates engage. Foreign actors are likely to suffer the “liability of foreignness” (Luo and Mezias 2002) when they are new entrants to a political environment, so transnational advocates are likely to be more effective when they have a longer history of working in a country. Transnational advocacy organizations also have distinctive styles of political engagement, often turning on their preference for insider tactics that are more collaborative relative to outsider tactics that are more confrontational (Stroup and Wong 2017). The effectiveness of these tactics depends on the availability of access points for weighing in on the policymaking process (Choi et al. 2015), the degree to which policymakers are responsive to public opinion and tolerant of independent civil society (Bernstein and Cashore 2012), and the presence and advocacy strategies of other advocacy organizations (Hadden 2015; Hadden and Jasny 2019).

3.6 Tracing the activities of three types of transnational environmental advocates

The three most prominent types of transnational advocacy organizations are large international environmental NGOs, international development organizations (IDOs), and large multinational corporations. In this section, I consider how each of these types of advocates attempts to stimulate the adoption and spread of environmental policies using a combination of strategic levers. I also describe how I measure the environmental advocacy activities of these actors and present data describing their transnational environmental advocacy activities over time. Despite the first-order importance of this question to understanding the impact of transnational advocacy on policy change, I know of only one prior work that has systematically collected data on the activities of a class of transnational advocates over time.⁶

⁶Hicks et al. (2010) present and explain trends in the distribution of international environmental development aid over time.

3.6.1 International environmental NGOs

Scholars of transnational environmental advocacy have devoted considerable attention to the activities of international environmental NGOs. They often occupy central positions in transnational advocacy networks, working to harmonize values among network members, create a common discourse and facilitate the distribution of information and services (Keck and Sikkink 1998). Transnational environmental NGOs frequently and explicitly take public positions in favor of increasing environmental policy leadership. Greenpeace, for example, regularly releases press statements declaring their intolerance for “apathy, excuses, and inaction from weak political leaders” (Greenpeace International 2019). Other NGOs, often those more reliant on maintaining the goodwill and funding of governments, use less confrontational language to express support for the same goal. For example, the World Wildlife Fund describes one of their core values as courage, explaining “We demonstrate courage through our actions, we work for change where it’s needed, and we inspire people and institutions to tackle the greatest threats to nature and the future of the planet, which is our home.”⁷ Although international NGOs have disagreements about the merits of specific environmental policies and desirable policy settings, they all seek to foster greater environmental policy leadership, collaborate closely on environmental policy issues, and attitudes toward these policies are similar enough to make general observations about international environmental NGOs as a whole (Bomberg 2007).

International environmental NGOs are strategic actors in terms of both the locations and topics on which they work. Obligated to seek funds from the public, philanthropy, or government, environmental NGOs decide where to work and what to work on based on a mix of their mission and opportunism.⁸ NGOs make every effort to work in locations of core interest, but they are also willing to take advantage of opportunities to work in new areas. For example, the Rainforest Alliance will make any effort necessary to find funding for its work in rainforests, but also engages in places that are more tangential to their mission, such as boreal forests in Canada.

⁷<https://www.worldwildlife.org/pages/our-values>, accessed April 29, 2021.

⁸Interview on July 8, 2019 with Jessica Troell, Environmental Law Institute. Interview on June 17, 2019 with Lydia Slobodian, International Union for the Conservation of Nature.

Environmental NGOs do not simply target easy countries with receptive and capable governments. Instead, these NGOs tend to focus their efforts on filling in where they are most needed, such as countries that repress domestic activism, have weaker institutions for environmental governance, and struggle with environmental governance (Murdie and Urpelainen 2015). Even the outbreak of violence does not necessarily force environmental NGOs out of the country, although their activities may be curtailed.⁹ Some countries have enacted legislation restricting or even banning the presence of international NGOs (Musila 2019), so these organizations do not often report working in those jurisdictions—but international environmental NGOs do sometimes nevertheless engage in activities in such places, such as North Korea (World Wildlife Fund 2005).

Many environmental NGOs combine advocacy with service provision. For example, Conservation International describes its work as “[c]ombining fieldwork with innovations in science, policy, and finance.”¹⁰ In some countries, the local subsidiaries of international environmental NGOs are formally registered with the government as lobbyists (e.g., World Wildlife Fund-US in the United States). These countries are typically wealthy, so environmental NGOs tend to combine domestic policy advocacy with fundraising for their international activities, either from government agencies or directly from the public. In other, typically poorer, countries, these organizations engage in policy advocacy indirectly, often couching their advocacy in terms of efforts to “strengthen the enabling environment” for better providing their services.¹¹ This rationale may reflect a true de-prioritization of policy advocacy in these settings, or it may instead be a simple consequence of the fact that it is illegal for foreign organizations to engage in formal lobbying in many countries (Steinberg et al. 2001).

Despite considerable scholarship describing case studies of international environmental NGO influence on domestic policy change (e.g., Steinberg et al. 2001; Hochstetler and Keck 2007; Hrabanski et al. 2013), there are relatively few large-sample cross-national analyses. Longhofer et al. (2016) finds that the number of international NGOs in a

⁹Interview on June 24, 2019 with Susan Lieberman, World Conservation Service

¹⁰<https://www.conservation.org/about>, accessed April 29, 2019.

¹¹For example, Secretariat (2019) characterizes lobbying by NGOs against undesired policies as, “drafting and pushing for policies that would enable them to fulfill their development tasks” (p. 5).

country predicts the adoption of environmental framework laws, environmental impact assessment (EIA) laws, and the creation of national environmental ministries. [Frank et al. \(2007\)](#) comes to a similar conclusion, finding that countries with more international NGOs adopted EIA legislation more quickly. [Pacheco-Vega and Murdie \(2020\)](#) finds that NGO activity is related to environmental quality but does not examine whether this relationship is due to policy change or alternative pathways, such as improved implementation or shifts in public pro-environmental behaviors. I am aware of no previous quantitative analyses of the role international NGOs may play as agents of policy diffusion, accelerating the spread of policy ideas across the jurisdictions in which they work.

3.6.1.1 Approach to measuring the activity of large international environmental NGOs

In this analysis, I focus on the largest international environmental NGOs, since these organizations are the best-positioned to gain access to policymakers ([Longhofer et al. 2016](#); [Stroup and Wong 2017](#)). I identify large international environmental NGOs as those that, as of 2019, attract at least \$10 million USD in 2019 annual revenue, are active in more than ten countries, and engage in project-centered work programs (as opposed to primarily product certification, for example). As indicated in [Table 3.A.1](#), the eleven qualifying international environmental NGOs are Conservation International, Flora and Fauna International, Friends of the Earth, Global Witness, Greenpeace, The Nature Conservancy, Oceana, Rainforest Alliance, World Conservation Society, World Resources Institute, and the World Wildlife Fund. All these NGOs were established before the year 2000 except for Oceana, which was founded in 2001, and they are all headquartered in the Global North, specifically in the Netherlands, the United Kingdom, and the United States.

To assess the effect of large international environmental NGOs on environmental policy leadership, it is necessary to first understand where these organizations have worked over time. The most widely used measure of international NGO activities is the Union of International Associations' Yearbook of International Organizations ([Union of](#)

International Associations (UIA) 2021). However, the database has at least one significant shortcoming: the Yearbook only asks where each organization has a permanent office or members. This approach overlooks international NGOs' common practice of working on projects in countries in which they do not have a permanent office.¹²

Accordingly, I created an original longitudinal dataset of the activities of large international environmental NGO activities. I measure each NGO's activities using a binary indicator of whether they claim to have implemented a campaign or project in a given country in a given year. Campaigns are often designed with the explicit goal of policy change, while projects typically consist of capacity building and/or technical assistance components, both of which may make the adoption of environmental policies more likely. To locate these claims, I examined nearly every annual report published by each of the eleven qualifying international environmental NGOs between 2000 and 2019, as well as versions of their websites cached on the Internet Archive (<https://archive.org/>). Most of these documents contain a section entitled "Where we work" consisting of a map or list of countries. In some cases, no single list of countries was available, so I was obliged to search through narrative descriptions of their activities for mentions of the countries in which they worked. With these data in hand, I aggregate to the country-year level by counting the number of large international NGOs working in each country for each year between 2000 and 2019.¹³ I also calculate the number of large international NGOs shared between each country dyad-year.

For example, the 2013 annual report for Conservation International features a detailed map indicating the location of its offices, national programs, subnational projects, and investments via partners in a total of 71 countries.¹⁴ In these countries, Conservation International conducted campaigns and programming to, among many others, expand forest and marine protected areas, the conservation of indigenous lands, and support sustainable coffee farming. Based on these data, I incremented by one the 2014 count

¹²NGOs often choose to manage projects from regional offices.

¹³Longhofer et al. (2016) and Pacheco-Vega and Murdie (2020) use a similar approach using a different dataset of NGO activities.

¹⁴https://www.conservation.org/docs/default-source/japan-documents/ci_fy14_annualreport.pdf, accessed June 23, 2021

of active large international environmental NGOs for each of the 71 countries in which Conservation International worked, as well as the 2014 count of shared NGOs for the 2,485 ($71 * 70/2$) relevant dyads.

The main benefit of this approach is that it is likely to be an up-to-date and comprehensive measure of the activities of large environmental NGOs. The staff writing annual reports and designing the website are motivated to list every country in which they work to better present an image of productivity to their Board of Directors, donors, and the general public. Archived and cached versions of the reports provide a reliable historical record and, by using a minimal definition of country activities, they provide information that can be compared and aggregated. As a result, I more accurately measure the geographic distribution of international NGO activity than more narrow measures, such as the data collected by the Yearbook.

Of course, this approach is not without its drawbacks. Obtaining and reading these materials is a time-intensive process, so I was only able to examine the largest environmental NGOs. Also, most international NGOs only started publishing digital versions of their annual reports and maintaining informative websites after the year 2000 and I was not able to access enough physical versions of these reports to the complete collection of data for prior years. This limitation is unfortunate, as many international environmental NGOs expanded rapidly in the 1990s (Olsen 1996). Additionally, as is the case with the Yearbook, each organization's activities are reduced to a simple dichotomy of presence or absence, and the activities of each NGO and each year of NGO presence are weighted equally. This binary measure fails to capture each NGO's distinctive characteristics, their varied legitimacy and sources of funding, and the extent and nature of their advocacy activities, all of which may have important implications for the NGO's impact on policy change (Stroup and Wong 2017). Despite this limitation, a binary presence indicator using data drawn from annual reports is the most reliable and comparable metric available for the advocacy activities of international NGOs.

3.6.1.2 The activity of large international environmental NGOs, 2000–2019

Figure 3.2 shows the average number of large international environmental NGOs present per country between 2000 and 2019. Even though much of the growth in international environmental NGOs is thought to have taken place in the 1990s, before the period of analysis, there is still a modest increase in the activities of large international environmental NGOs since 2000. Starting from an average of 2.29 NGOs per country in 2000, this figure rose to a peak of 2.99 NGOs per country in 2011 before falling back to between 2.55 and 2.79 NGOs per country.

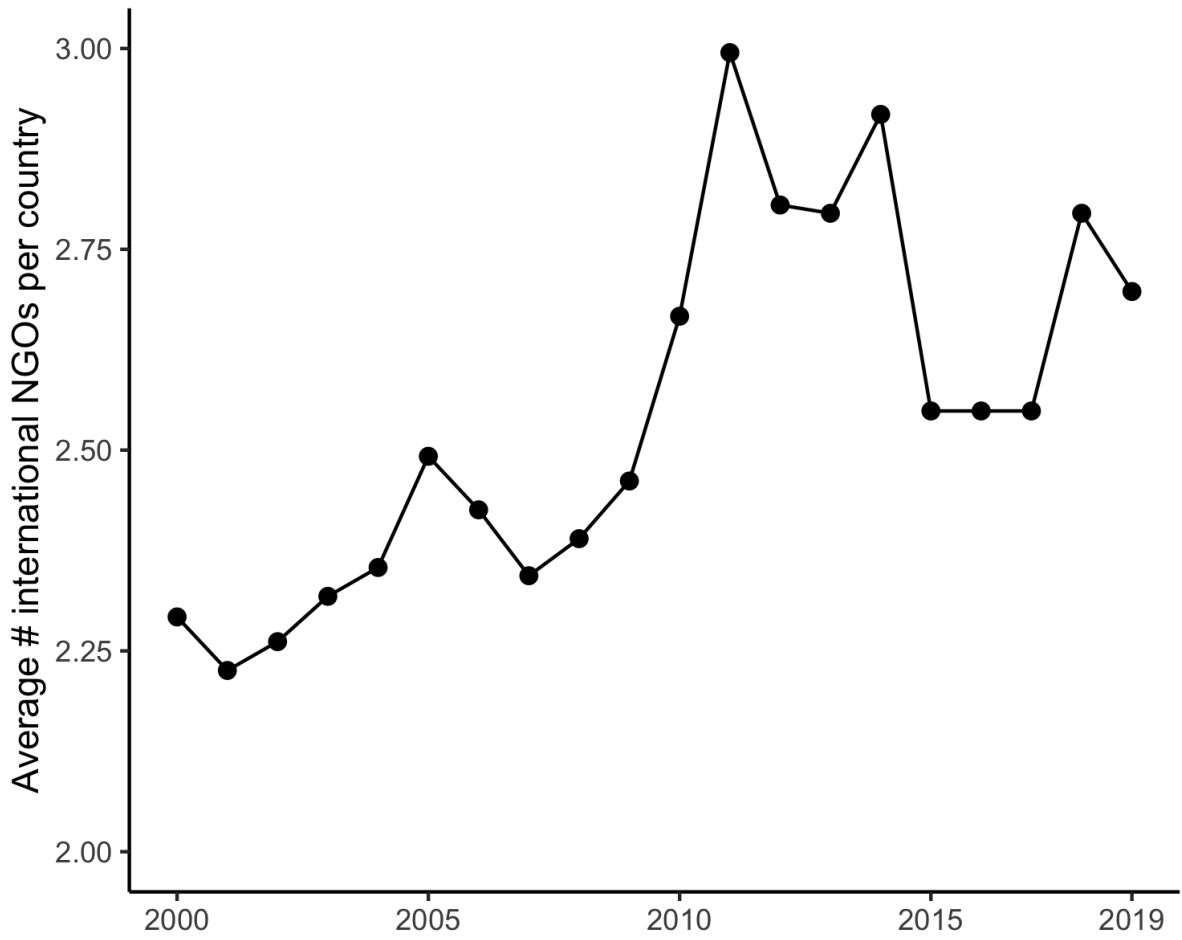


Figure 3.2: Average number of large international environmental NGOs present per country, 2000–2019.

Figure 3.3 displays the geographical distribution of international environmental NGOs in 2019. As of 2019, there are 154 countries in which at least one large international environmental NGO is active (an 11% increase over the total in 2000), 119 countries with at least two NGOs active (an 18% increase over the total in 2000), and 41 countries in which five or more NGOs are working (a 21% increase over the total in 2000). As a result, there is now at least one large international environmental NGO present in approximately 80% of countries recognized by the United Nations. There are only a handful of countries in which nearly all large environmental NGOs work; all eleven NGOs are present in the United States and ten of the eleven are active in Brazil, Indonesia, and the United Kingdom in 2019. There are also distinct regional trends, with tropical countries tending to attract NGOs to a greater degree than countries in North Africa, the Middle East, and the Caucasuses.

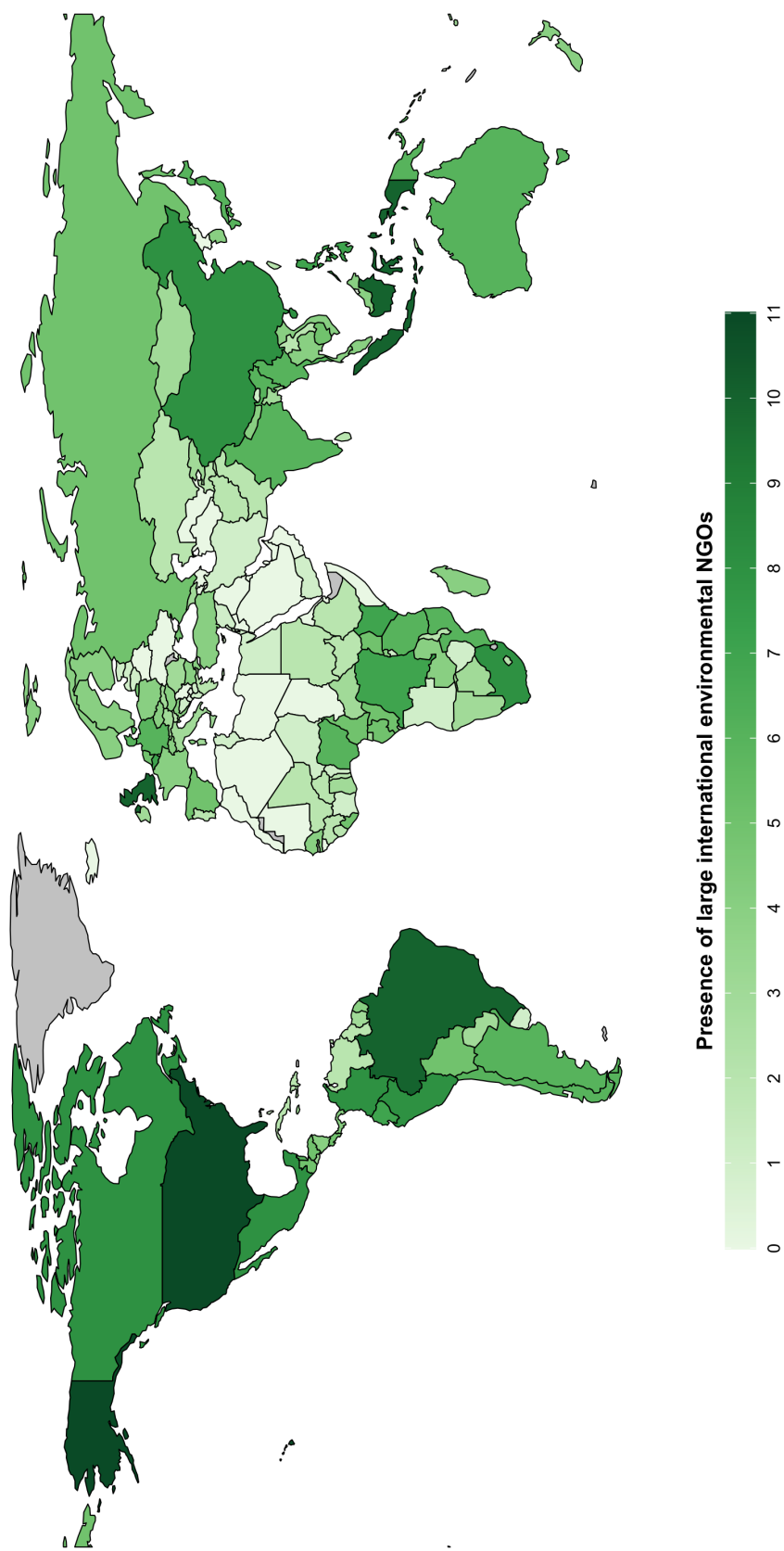


Figure 3.3: Geographical distribution of large international environmental NGOs present, 2019. Darker colors indicate the presence of more NGOs. Countries with missing data are indicated in grey.

3.6.2 International development organizations

Foreign aid, broadly construed, has existed for centuries as a means of influencing the policies and activities of other countries. Historical examples of foreign aid include tributes Rome received from its allies for military protection, loans France extended to Russia for the purchase of military equipment following their alliance in 1895, and a small fund included in the first appropriation act of the United States Congress in 1789 for bribing foreign policymakers (Morgenthau 1962). However, the modern phenomenon of international development is relatively new, originating with the 1948 Marshall Plan to rebuild Europe following World War II (Hart 2010). As such, international development has historically been organized by countries in the global North (Rowlands 2008), facilitated by international organizations like the United Nations, the World Bank Group, and the Organizations for Economic Cooperation and Development (OECD).

The core mission of international development organizations is to distribute official development assistance (ODA), meaning grants or low-interest loans to accelerate improvements in economic development and social welfare via targeted interventions (OECD/DAC 2015).¹⁵ ODA can be provided either on a bilateral basis by dedicated agencies of national governments (bilateral funders, such as Norway's Agency for Development Cooperation) or via international organizations (multilateral funders, such as the World Bank). As observed by Bernstein et al. (2010), one of the primary purposes of ODA is to encourage policy change: "the ultimate goal of many international and transnational attempts to address global problems is to influence domestic policymaking processes rather than simply to constrain or modify the external behavior of states" (p. 111).

IDOs engage in activities that target the levers of information, capacity, and political will to improve welfare via changes in target countries' enabling environment, or their political institutions and policies. These activities range from educational and training workshops to multi-stakeholder co-governance partnerships to technical assistance with

¹⁵In their aggregate, these interventions constitute a global project sometimes termed "big D" Development, which should be distinguished from "little d" development, which describes the unfolding and interconnected processes of economic creation and destruction (Hart 2010).

legislation, regulation, and implementation. While IDOs rarely engage in formal lobbying, they attempt to buy direct access to the policymaking process by conditioning countries' eligibility for projects on the adoption of specific policies (Bernstein and Cashore 2012). For example, because the government of Sri Lanka was willing to enact a policy authorizing public-private partnerships for infrastructure development in 1992, the United States Agency for International Development (USAID) provided \$10 million in technical assistance to strengthen the law's implementation (Appuhami et al. 2011).

Most ODA flows from countries in the Global North to the Global South, as governments in Global South countries often lack sufficient human and financial resources to design and implement development projects at scale (McEwan and Mawdsley 2012). The countries that receive ODA may genuinely be those most in need of assistance or hold the most potential for improvement. Environmental conditions, for example, predict which countries receive environment-specific ODA (Hicks et al. 2010). However, Hicks and colleagues are careful to note that these problem-specific factors have a smaller impact on the distribution of environment-specific ODA than generic economic factors, such as trade ties, and political factors, such as colonial legacies.

Scholars have extensively studied the impact of IDOs on domestic policy change. Although some analysts question the extent to which IDOs are successful in their attempts to shape the political enabling environment (Gordon 1992), most studies find that IDOs play an important role in stimulating policy change. Examples of instances of successful policy promotion by IDOs include public-private partnerships (Appuhami et al. 2011), the privatization of the electricity sector (Gore et al. 2019), the creation of environmental ministries (Aklin and Urpelainen 2014), renewable energy policies (Baldwin et al. 2019), and small-scale fisheries management (Hamilton et al. 2021). However, this literature faces the lingering risk of selection bias. These studies examine only one or two policies at a time and it seems likely that policy promotion efforts are deemed worthy of study (and publication) in part due to these policies' widespread adoption.

3.6.2.1 Approach to measuring the environmental activity of IDOs

In this analysis, I consider the aggregate activities of IDOs reporting to the OECD's Development Assistance Committee (DAC). The thirty bilateral donors that are members of the DAC, along with closely aligned multilateral organizations like the World Bank, constitute the mainstream official development community (McEwan and Mawdsley 2012).¹⁶ While the DAC does not direct donor practices, it coordinates development activities via a series of agreements among bilateral and multilateral aid donors (McEwan and Mawdsley 2012).¹⁷ Perhaps the most high-profile DAC initiative of recent years was the High Level Forums on Aid Effectiveness, which took place between 2003 and 2011 and produced a set of principles and quantified targets for aid effectiveness. Through these efforts, while each IDO retains distinctive priorities and approaches, all DAC members agree on a common set of 'best practice' recommendations and targets on topics like gender, environment, participatory development, democratic governance, and peacebuilding (Inada 2013). As such, the development activities of DAC members can be viewed as manifestations of a single overarching model of international development (Kondoh et al. 2015).¹⁸

ODA typically takes the form of discrete projects, which direct funds to pay for the personnel and materials necessary to produce a specified set of outputs (programmatic activities) and outcomes (changes in behavior or institutions) in the pursuit of an objective (economic, social, and environmental development goals). Each project is designed to unfold over a given period of time (typically three or five years), although projects are often renewed or revised. To illustrate, a development organization could allocate \$5 million over five years at a rate of \$1 million per year to pay for the construction

¹⁶See Table 3.A.2 for the set of DAC-reporting countries included in this analysis.

¹⁷These agreements include the DAC New Development Strategy in 1996, Rome Declaration on Harmonization in 2003, the Memorandum of the Marrakech Roundtable on Managing for Results in 2004, the Paris Declaration on Aid Effectiveness in 2005, Accra Agenda for Action in 2008, and Busan Outcome in 2011.

¹⁸Official providers of international development funds that do not contribute to the OECD DAC are Brazil, Chile, China, Colombia, Costa Rica, India, Indonesia, Mexico, South Africa. China and India approach international development differently from DAC countries, emphasizing state-directed commercial investment, trade-related concessional financing, and cultural exchange. Using the DAC's definition of official development assistance, the largest non-OECD DAC funders are China (\$4.4 billion USD in 2018) and India (\$1.2 billion USD in 2018) (OECD 2020). The other non-DAC development funders adhere more closely to the DAC model (Kondoh et al. 2015).

of bicycle paths (an output) to increase the number of people commuting by bicycle (an outcome), leading to a reduction of air pollution (an objective). IDOs may also establish programs that coordinate activities across related projects.

I measure the environmental activity of IDOs as the amount of committed ODA funding for environmental projects or programs by DAC-reporting IDOs per capita in a country in a given year. I use the volume of funding rather than the number of projects to account for variation in project size. I define an environmental project as any project or program that IDOs designate as addressing environmental issues as a principal or important secondary objective. To locate these projects, I examined OECD's Creditor Reporting System-Aid Activity (CRS-AA) database. The CRS-AA database provides a compilation of all individual ODA projects and programs by IDOs reporting to the DAC. Each entry represents a unique project and contains a variety of financial and descriptive information, including indicators of objectives relating to climate change adaptation, climate change mitigation, biodiversity, desertification, or local environmental issues. From these indicators, I construct a binary environmental project variable set to one if a project's primary or important secondary objective relates to any environmental issue and zero otherwise. Using this measure, I then calculate committed funds for environmental projects per capita across all IDOs for each country-year.¹⁹ For developing countries, this measure is all incoming funds for environmental ODA. For developed countries, this measure is all outgoing (and incoming, if any) funds for environmental ODA. I also calculate the amount of environmental ODA funding committed from funder to recipient at the country-dyad year level.²⁰

Extending the hypothetical bicycle paths example introduced above, the CRS-AA would record the project and indicate its environmental content using the local

¹⁹I omit projects that do not have specific recipient countries listed, such as regional projects. I also omit debt relief and humanitarian aid, as these expenditures are not interventions likely to lead to environmental policy change. I use commitments instead of disbursements because the CRS-AA has incomplete data on disbursements for screened projects. If the database indicated funds disbursed but not funds committed, I use funds disbursed instead.

²⁰Although IDOs tend to be agencies of developed country governments and work in developing countries, they do not always do so. Between 2002 and 2019, DAC donors spent \$2.9 billion USD on environmental projects in 15 developed countries, including Chile, Saudi Arabia, and Slovenia. Accordingly, I treat all dyads as potentially non-zero observations.

environmental issue indicator. This project would then increase the environmental ODA in the recipient country by \$1 million for each year during the project's five-year lifetime. It would also increase the directed dyad between the IDO's host country and the recipient country by \$1 million for each of the project's five years.

This approach has several benefits. It uses project-level data, allowing me to distinguish between environment and non-environment ODA. Additionally, it includes both projects that have environmental issues as a primary objective and projects in which environmental issues have been mainstreamed into project design as important secondary objectives, an increasingly common practice that has been an important limitation of prior data on environmental aid (e.g., [Hicks et al. 2010](#)). Finally, by aggregating over all IDOs, I account for the frequent collaboration among DAC donors, who typically endeavor to create synergies and avoid creating duplicate projects. For example, a combination of multilateral development banks (International Monetary Fund, the World Bank, and the Asian Development Bank) and USAID successfully induced Sri Lanka to embrace public-private partnerships for infrastructure development ([Appuhami et al. 2011](#)). At the same time, by measuring the volume of environmental ODA funding flowing between each funder-recipient dyad, I treat bilateral IDOs as instruments of foreign policy for donor governments that are likely to create leader-follower policymaking relations ([Bernstein et al. 2010](#); [McEwan and Mawdsley 2012](#)).

There are three main drawbacks to this measurement approach. First, CRS-AA only includes data on the IDOs that choose to report to the DAC, omitting the activities of Chinese and Indian IDOs that do not report to the DAC. This omission is unfortunate because, while only a relatively small proportion of China and India's foreign aid can be classified as ODA ([OECD 2020](#)), their use of state-directed commercial investment, trade-related concessional financing, and cultural exchange is substantial and is likely to generate policy change as a result.²¹ Second, the number of organizations reporting to the DAC has increased over time. This changing set of IDOs hinders longitudinal

²¹While some databases exist that compile Chinese and Indian ODA (e.g., <https://www.aiddata.org/>), it is challenging to use these data in conjunction with CRS-AA data because they generally do not use the CRS-AA environmental indicators.

comparisons, although this challenge can be addressed by subtracting each country-year value by the relevant year's average value (in the context of a statistical regression, this calculation is equivalent to year fixed effects). Third, the CRS-AA database ramped up its screening projects for environmental objectives over time, rising from 27% of ODA funding screened for at least one environmental indicator in 2002 to 60% in 2019. This change means that not only does the measure assume the proportion of environmental projects in unscreened projects equals the proportion of environmental projects in screened projects, but it also assumes that this proportion is constant over time. That being said, the project-level DAC data provides an unparalleled picture of environmental ODA spending and its evolution over time. Moreover, it is possible to run extreme bounds sensitivity tests to understand the extent to which results change with different assumptions about the prevalence of environmental objectives in unscreened projects.

3.6.2.2 The environmental activity of IDOs, 2002–2019

Figure 3.4 shows the amount of funding for environmental ODA projects, funding screened for environmental content, and overall ODA funding for each year between 2002 and 2019 (all values in constant 2019 USD). All three variables have shown steady growth over this period. In terms of relative growth, while overall ODA funding increased by 75% over this period, environmental ODA increased by 350%. However, this difference in growth rates may be due in part to the increasing percentage of ODA screened for environmental content. In 2002, only 38% of ODA was screened for environmental content, rising to 66% in 2019. During this period, the percentage of screened ODA with environmental objectives varied from approximately 20% in 2004–2008 to more than 40% in 2017–2019.

The maps below display the geographical distribution of environmental ODA funding per capita in 2019 for donors (Figure 3.5) and recipients (Figure 3.6). In 2019, the CRS-AA database recorded \$47.4 billion USD in committed funds for environmental ODA projects and programs. Bilateral IDOs committed \$40.9 billion USD (86%) of all environmental ODA funding, led by Japan (\$13.3 billion USD, 33% of the total), France (\$10.8 billion USD, 27% of the total), and Germany (\$6.3 billion, 15% of the total). 143

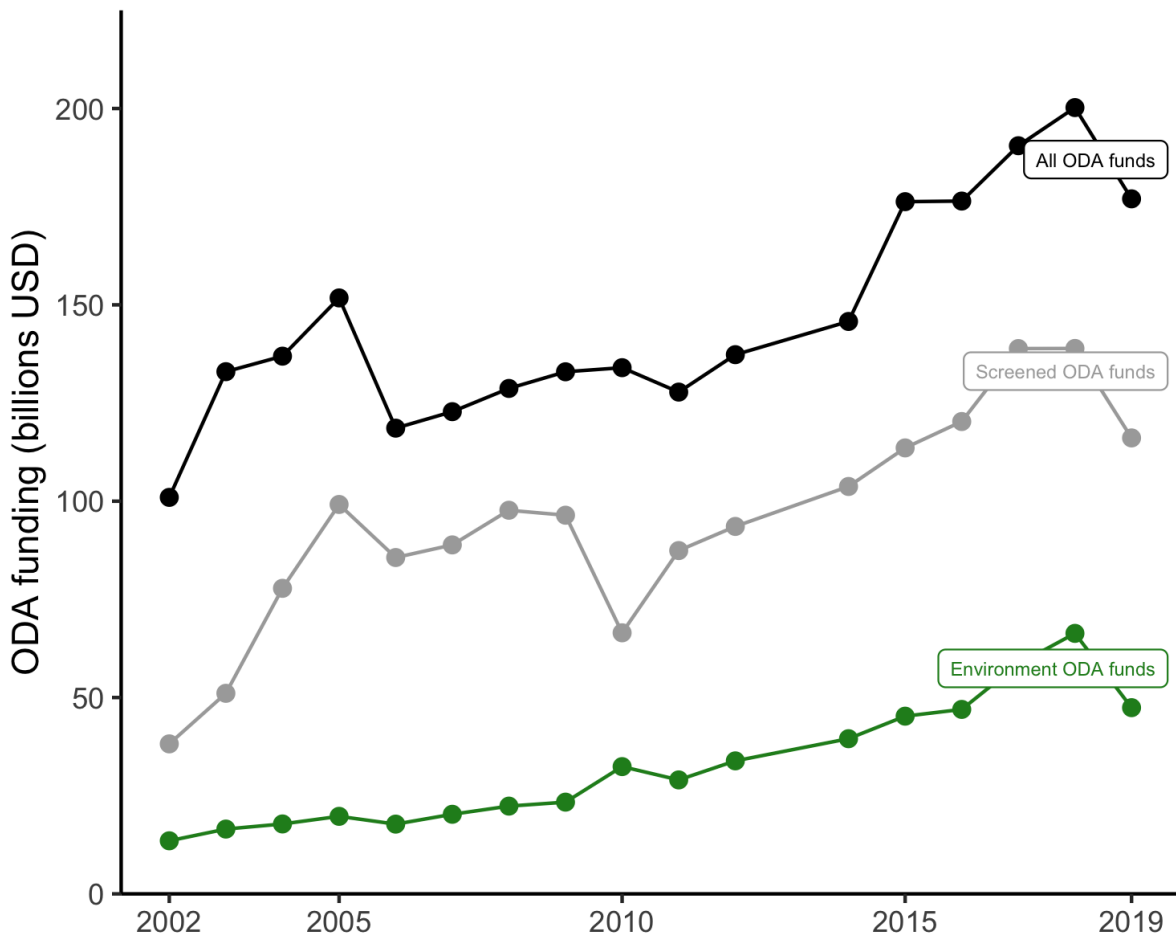


Figure 3.4: Overall ODA funding, funding screened for environmental content, and environmental ODA funding, 2002–2019.

Overall ODA funding in black, environment-screened ODA in grey, and environmental ODA in green. The figure for recipients omits debt forgiveness and humanitarian assistance, as well as ODA from non-DAC reporting organizations, such as India and China.

countries received environmental ODA funding, but 43% of environmental ODA funding was directed to just 10 countries. India and Bangladesh received the most environmental ODA funding in 2019. India's largest environmental ODA project was a \$537 million USD concessional loan from Japan for a public transit project in Mumbai. Bangladesh's largest environmental ODA project was a \$287 billion USD concessional loan from Japan for a coal-fired power plant.

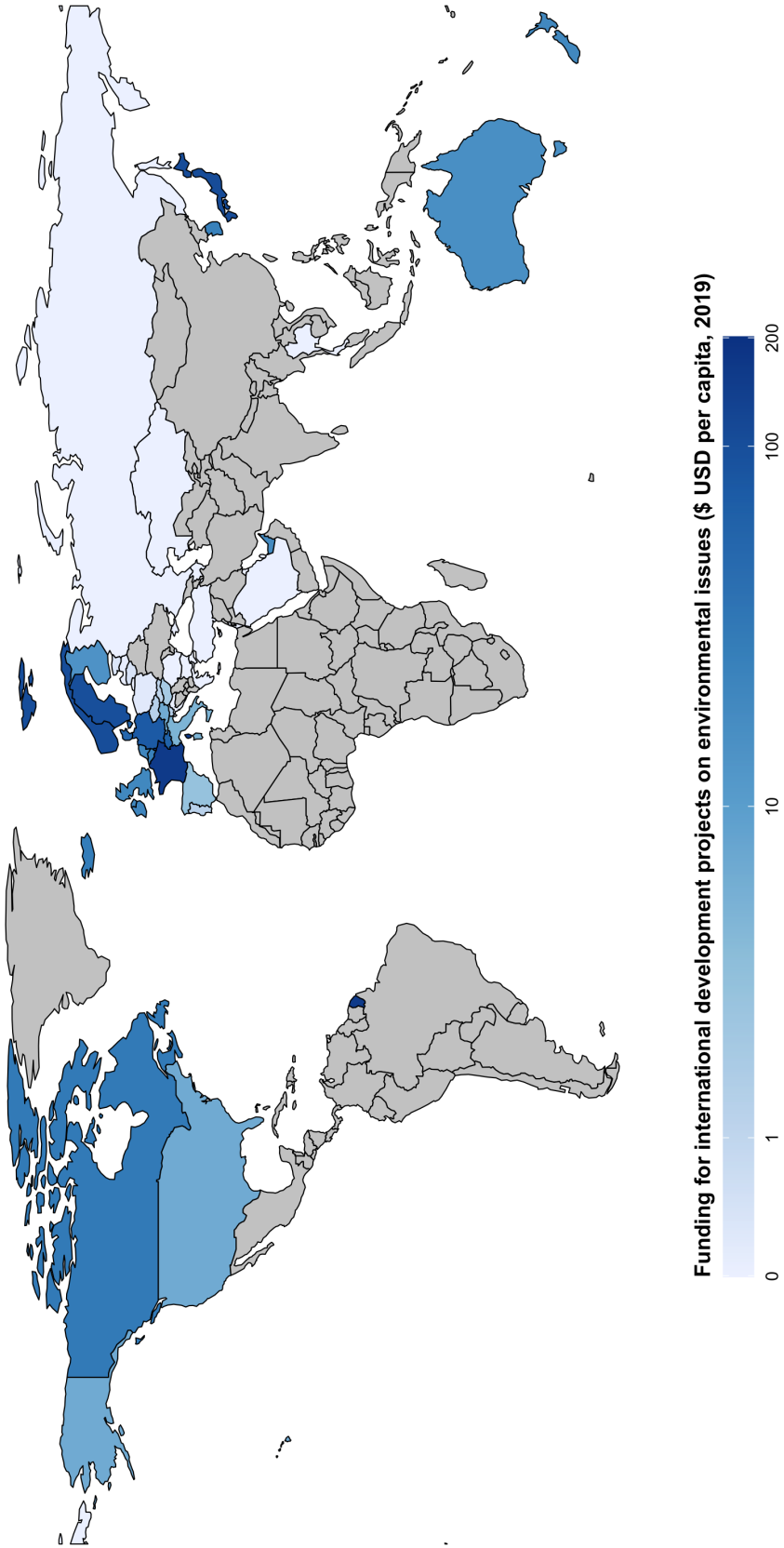


Figure 3.5: Geographic distribution of environmental ODA funding by IDOs reporting to the DAC in 2019 (donor perspective). Darker colors indicate higher expenditures. These data only include data for bilateral IDOs. Countries with missing data are indicated in grey.

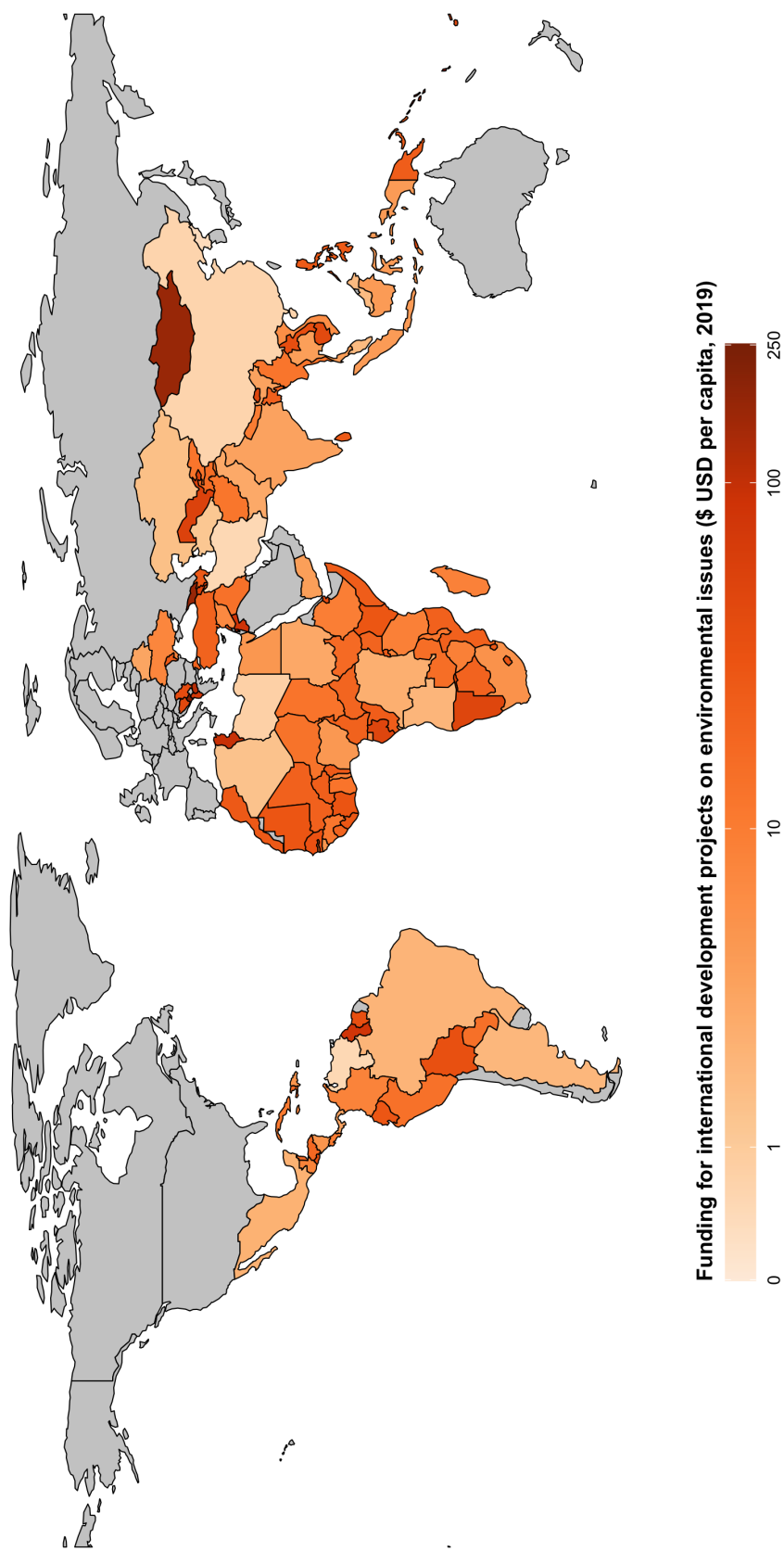


Figure 3.6: Geographic distribution of environmental ODA funding by IDOs reporting to the DAC in 2019 (recipient perspective). Darker colors indicate higher expenditures. These data omit debt forgiveness and humanitarian assistance, as well as ODA from non-DAC reporting organizations, such as India and China. Countries with missing data are indicated in grey.

3.6.3 Multinational corporations

Multinational corporations (MNCs) are profit-seeking firms that own or control the production of goods or services in at least two countries at the same time (Kim and Milner 2021). Estimates vary, but there are at least 80,000 non-financial multinational corporations with more than 230,000 foreign subsidiaries, accounting for 23% of all employment and 33% of global output (De Backer and Miroudot 2018). Relative to domestic firms, multinationals tend to be larger, more productive, employ more skilled workers, and spend more on research and development (Bernard et al. 2009; Autor et al. 2020). For the largest corporations, firms with \$1 billion USD in annual revenue or more, 42% of all sales take place outside of their home country (Manyika et al. 2018).

Corporations engage in political activity to influence the decisions of government policymakers, who set rules and control resources that shape the markets in which firms compete (Baron 1995; Coen 1997). Since multinationals frequently opt to create specialized subsidiaries and form global value chains spanning multiple jurisdictions (Ghoshal and Bartlett 1990), they have a particularly strong incentive to engage proactively with policymakers, secure favorable regulations, and ensure smooth operations across borders (Baysinger 1984; Sundaram and Black 1992; Hillman and Wan 2005). Employees at multinational corporations may also believe it to be their duty to use their positions to promote social welfare out of a sense of corporate citizenship (Crane et al. 2008; Scherer et al. 2013). For these reasons, multinationals are more likely than their domestic counterparts to engage with policymakers about political issues, spend more on lobbying expenditures, and lobby on a more diverse set of issues (Kim and Milner 2021; Kim et al. 2019).

Outside of their home country, multinationals are obliged to lobby via their subsidiaries (Lee 2020). The subsidiaries of multinationals face challenges to acting as effective advocates if they are perceived to be foreign entities (Luo and Mezas 2002) or if they lack local political knowledge and contacts (Yan and Chang 2018). Corporate headquarters may try to devise universal approaches to political activities (Mahini 1988) that collide with the reality of varied government structures, issue relevance,

and strategy effectiveness (Blumentritt and Nigh 2002). However, these challenges are relatively small compared to the advantages enjoyed by multinationals (Wöcke and Moodley 2015). In addition to substantial economic resources and a skilled workforce, multinationals can make credible threats of relocation and, at the corporate level, have deep experience working with public officials (Desbordes and Vauday 2007). Moreover, most governments, especially those in developing countries, are enthusiastic supporters of multinationals, often in the belief that multinationals accelerate economic development by more productively exploiting national resources than domestic firms and providing financial resources for investment that governments lack (Desbordes and Vauday 2007; Iftinchi et al. 2018). As a result, the subsidiaries of multinationals are some of the most powerful actors in the countries in which they operate (Jensen et al. 2012).

Firms have three primary strategies at their disposal to advocate for favored policies (Hillman and Hitt 1999). The most direct strategy is to change purchase access to the policy process and alter political will by providing policymakers with campaign contributions, political action committees, government membership on company boards, and bribes (Hillman and Hitt 1999; Lawton et al. 2013).²² A somewhat more nuanced approach is to engage in formal lobbying and informal consultation, offering their technical expertise to inform policymakers and empower policymakers by reducing their uncertainty about the consequences of different policy alternatives (Young 2012). The least direct strategy is to wage political campaigns via the media (Bonardi and Keim 2005), allied civil society organizations (Beyers and De Bruycker 2018), and the public (Kollman 1998). Multinationals can also use a “boomerang” advocacy strategy (Keck and Sikkink 1998) by inducing politically powerful multilateral institutions to weigh in on their behalf (Nose 2014).

Multinationals are well-positioned to act as agents of policy diffusion (Rajwani and Liedong 2015). Confronted with a different set of regulatory requirements in each country, they have a strong incentive to pursue regulatory uniformity across jurisdictions to maximize operational efficiency (Vogel 1997; Yaziji 2004). While this dynamic does

²²Desbordes and Vauday (2007) notes that the 1997 OECD Anti-bribery convention likely reduced the use of bribery by multinationals and increased the use of conventional lobbying activities.

not imply convergence in specific policy settings—multinationals are likely to reflect the diversity of policy positions of their home countries (Prakash and Potoski 2007)—it does indicate that multinationals should hasten the adoption and shape the spread of policy ideas among the jurisdictions in which they work.

Beyond the core issues of free trade, investment protections, and capital mobility (Milner 1988; Frieden 1991; Osgood et al. 2017), multinationals actively seek to shape regulations affecting their global value chains (Kim et al. 2019), such as labor practices (Scherer and Palazzo 2007) and environmental protection (Garcia-Johnson 2000). Garcia-Johnson (2000) points out that, despite popular perceptions to the contrary, multinationals often favor more proactive governance, especially in developing countries. Most multinationals are based in Global North countries with long histories of environmental policymaking (De Backer and Miroudot 2018). Since multinationals are often expected to follow the rules, or at least the spirit of the rules, of their home countries when operating abroad (Doorey 2011), firms have an incentive to lobby host governments to level the playing field by enacting similar policies. Multinationals from these countries are also already adapted to meeting relatively stringent environmental standards, placing them in an advantageous position relative to domestic firms if host governments adopt similar laws. This dynamic has been described in the domestic United States context as the “California effect” (Vogel 1997, 2018). Of course, this logic likely does not extend to countries that already have stringent environmental regulations, as domestic firms will have adapted and become more competitive relative to their multinational counterparts. In these contexts, multinationals may act to minimize their policy exposure by lobbying in favor of the status quo (Brulle 2018; Cory et al. 2021), stymieing attempts to adopt new policy ideas and weakening environmental policy leadership.

Multinationals are strategic in choosing the countries in which they work. The opportunity to enter large consumer markets, access natural resources, knowledge, and specific technologies, and benefit from favorable financial and tax legislation is thought to impact these decisions (De Backer and Miroudot 2018). Firms also prioritize their ability to protect their investments from punitive and capricious government policies

(Vernon 1971; Henisz 2000). Toward this end, multinationals tend to favor countries that have more convoluted policymaking processes, with the idea that systems with more veto players will both have more difficulty in expropriating investments and offer more access points to influence policy (Choi et al. 2015). Similarly, multinationals may seek out allies in civil society to raise the political cost of expropriation (Jensen et al. 2012). However, this strategy comes at a cost, as giving more space to interest groups makes the market for influence over policymaking more competitive (Bonardi et al. 2005).

While there is substantial work on the advocacy efforts of multinationals, the determinants of their strategies, and the process by which these strategies are selected, there is less work on the implications of corporate political advocacy for policy outcomes. Although Rajwani and Liedong (2015) conclude that corporate political activity aimed at inducing policy outcomes is generally successful, the dependent variable in many of these studies is firm self-reports of advocacy efficacy (e.g., Desbordes and Vauday 2007; Choi et al. 2015) rather than intersubjective observations of policy change. Moreover, there are few, if any, studies that consider outcomes across a wide range of policies, raising the risk of selection bias. Similarly, while the policies promoted by multinationals' subsidiaries are thought to be interdependent across countries, there is little systematic evidence of this effect (Puck et al. 2018).

3.6.4 Approach to measuring the environmental advocacy activity of multinational corporations

In this analysis, I focus on the lobbying activities of the multinational firms listed as components of the S&P 500.²³ These corporations are some of the largest firms in the world, with a total capital value of more than \$33 trillion USD. I measure each firm's environmental lobbying effort in terms of the country-firm-issue-year, meaning the amount of money each firm spent lobbying a given country on a given issue in a given year. The procedure for constructing this measure consists of two parts: what firms lobby on and where they work. To my knowledge, this is the first global measure of

²³As of May 7, 2021, 497 of the 500 S&P 500 firms operate in at least two countries.

multinational political advocacy.

To establish what firms lobby on, I turn to the LobbyView database, which compiles official disclosure forms filed by organizations lobbying the United States government (Kim 2018).²⁴ For each firm in the S&P 500, I calculate how much each multinational firm spent lobbying the United States governments on fifteen environmental topics for each year between 2000 and 2019. I then aggregate this spending into lobbying on either traditional environmental issues or secondary environmental issues, with the latter relating primarily to natural resource use rather than flora, fauna, and environmental media.²⁵ I make three key assumptions at this stage: 1) firms’ distribution of issue importance does not vary across countries, 2) firms’ distribution of issue importance is independent of what other firms lobby on, and 3) firms that do not file lobbying disclosures in the United States do not engage in lobbying elsewhere. Although these assumptions are unlikely to be strictly true, they are reasonable in the absence of additional cross-national data on corporate environmental lobbying.

To establish where firms work, I use the Orbis database, a product published by the Bureau van Dijk.²⁶ The Orbis database contains information on nearly 400 million companies worldwide, including location, estimated size, and corporate ownership. Table 3.1 summarizes the four categories for estimated firm size, consisting of Small (<1 million EUR per year), Medium (>1 million EUR per year), Large (>10 million EUR per year), or Very large (>100 million EUR per year).

Table 3.1: Categories and examples of Orbis firm size estimates

Category	Estimated revenue (EUR per year)	Example
Small	< 1 million	Kimberly-Clark Zimbabwe (Private) Limited
Medium	> 1 million	Clorox Uruguay S.A.
Large	> 10 million	Cisco Systems Capital Korea Ltd.
Very large	> 1000 million	IBM Danmark ApS

²⁴<https://www.lobbyview.org/>, accessed May 4, 2021

²⁵Of the fifteen topics, ten are traditional environmental issues—air & atmosphere, energy, environmental procedures (e.g., environmental impact assessment), fisheries, forestry, land & soil, mineral resources, waste & hazardous substances, water, wild species & ecosystems—and five are secondary environmental issues—agricultural & rural development, cultivated plants, food & nutrition, livestock, marine issues.

²⁶<https://orbis.bvdinfo.com/>, accessed on May 4, 2021.

For each firm-year, I use data from Orbis to identify the estimated size of the largest corporate group member (ultimate owner, subsidiary, or branch) in each country. For this step, I assume that firms lobby in proportion to their financial presence in a country. Using the Orbis database, I establish the date at which each subsidiary entered the current corporate group either through incorporation or acquisition. Due to data limitations in Orbis, I only consider firms that are current corporate group members and omit firms that have been sold in the past.

Next, I combine what firms lobby on and where they work into a single measure. I first estimate the amount of money each firm spends on lobbying in a given country by scaling the firm-year lobbying expenditure on traditional and secondary environmental issues in the U.S. by the estimated size of the largest subsidiary in the focal country relative to the estimated size of its largest U.S. subsidiary. This step produces estimates of the funds each firm spent lobbying each country on both traditional and secondary environmental issues in each year between 2000 and 2019. I express these estimates in terms of dollars of lobbying expenditure per billion dollars of the host country's Gross Domestic Product (GDP) to better represent the influence of multinational lobbying relative to the size of the local economy. As a result, I treat a dollar spent by multinationals lobbying in countries with strong domestic firms, such as the United States or the United Kingdom, as less than a dollar spent by multinationals in countries with weaker competition for lobbying influence by domestic firms, such as Singapore or Ireland. As a dyadic measure, I take the straightforward approach by counting the number of multinationals working in both countries and engaged in any amount of environmental lobbying.

As an illustrative example, consider a hypothetical company that is classified as a Very large company in the United States, with revenues in excess of 100 million EUR per year. In 2015, this company spent \$8 million (80%) on energy issues. This company has a Large Canadian subsidiary, meaning it has revenues greater than 10 million EUR (but less than 100 million EUR). Since the Canadian subsidiary is approximately one-tenth (using minimum break points between size classes) as large as the U.S. subsidiary, I estimate that the Canadian subsidiary spent \$800,000 lobbying the Canadian government

on energy issues in 2015. The dyadic measure would indicate that the US and Canada share one multinational corporation in common that engages in environmental lobbying.

To understand why I undertook this measurement approach, it is helpful to consider some alternative methodologies. First, I could scale lobbying expenses by the overall revenue of the ultimate owner instead of using the estimated size of the largest country subsidiary. This option aligns with Lee's (2020) observation that small subsidiaries of large firms engage in outside lobbying in the United States, but it does not allow firms to vary in their lobbying intensity across countries within a firm-year, an essential characteristic for a satisfactory measure of multinational lobbying activities. Second, I could scale lobbying expenses by the count of subsidiaries or branches in a country, which provides a rough proxy for how much business a firm engages in with a given country while allowing differentiation in geographical presence within a firm-year. However, this approach assumes the size of each subsidiary is equal, which seems like an untenable assumption. Third, I could scale lobbying expenses by the sum of subsidiary revenues in each country. In theory, this strategy would be capable of representing each firm's aggregate presence, rather than just its largest representative. Unfortunately, reported revenues for subsidiaries are rarely reported in Orbis and these revenues are inconsistently reported as a mix of unconsolidated and consolidated (corporate group-level) revenue reports.

A strength of this measure is that nearly every firm in the Orbis database has an estimated size, allowing for differentiation in geographical presence within a firm-year. Alternative, more precise measures, such as subsidiary revenue, are only sporadically reported. Another strength of this measure is that it considers variation in the size of multinationals' subsidiaries, rather than the overall size of the corporation. It reflects the idea that the characteristics of multinationals' subsidiaries matter for their effectiveness as policy advocates. For example, large subsidiaries often have more resources, more political clout, higher visibility, and stand to gain larger benefits from policy advocacy (Vernon 1971; Deephouse 1996; Schuler et al. 2002). A third benefit of restricting the sample to the S&P 500 is that most of these firms are based in the United States, meaning

they are more likely than most multinationals to engage in lobbying for policy and less likely to use more ad hoc forms of advocacy, such as bribery (Yu and Lee 2021).

There are several weaknesses with this measurement approach. First, it underweights firms with many small subsidiaries in a country, which would be challenging to aggregate using the relatively blunt size measure. A second, related challenge is that Orbis does not provide estimates of how certain it is about its size estimates, so it is not clear how much error exists in the database. A more substantive, third concern with this approach is that it does not account for the increasingly prevalent practice of substituting corporate affiliates with independent contractors (De Backer and Miroudot 2018). A notable example of this practice is Apple's contracts with the Taiwanese firm Foxconn to manufacture iPhones in China (Liang 2016). Fourth, the measure does not include activities by trade associations, which can be important venues for collective action by firms (Cory et al. 2021). However, this gap is offset by evidence that multinationals are more likely than domestic firms to engage in political activities on their own instead of relying on coalitions (De Figueiredo and Richter 2014). A fifth and final drawback is the risk that multinational firms may take opposing positions on enacting policies, leading to an underestimate of their true influence (Hillman et al. 2004). However, it should be noted that the firms would need to disagree on the merit of enacting *any* kind of policy, rather than specific policy settings, for offsetting effects to appear. More generally, despite these shortcomings, my approach provides plausible estimates of corporate environmental lobbying around the world and over time, the first of their kind. If and when comparable data on corporate environmental lobbying become available, these estimates could be even further improved.

3.6.4.1 The environmental advocacy activity of multinational corporations, 2000–2019

Figure 3.7 shows the total estimated amount of money spent on lobbying by multinational S&P 500 firms across all countries and on traditional and secondary environmental issues in each year between 2000 and 2019. Environmental lobbying accounts for an average of

14.8% of all lobbying expenses over this period, with the traditional environmental issues attracting 72% more expenditures than secondary environmental issues.²⁷ Multinationals have varied their environmental lobbying activities substantially over this period, rising from just over \$600 million USD in 2000 to a peak of just under \$2 billion USD in 2009 before falling to \$1.2 billion USD in 2019. Given the lack of comparable lobbying data from other countries, it is challenging to discern whether this evolution primarily reflects a change in environmental lobbying demand in the United States (e.g., driven by proposed climate legislation in 2009) or if it reflects changing lobbying conditions more broadly.

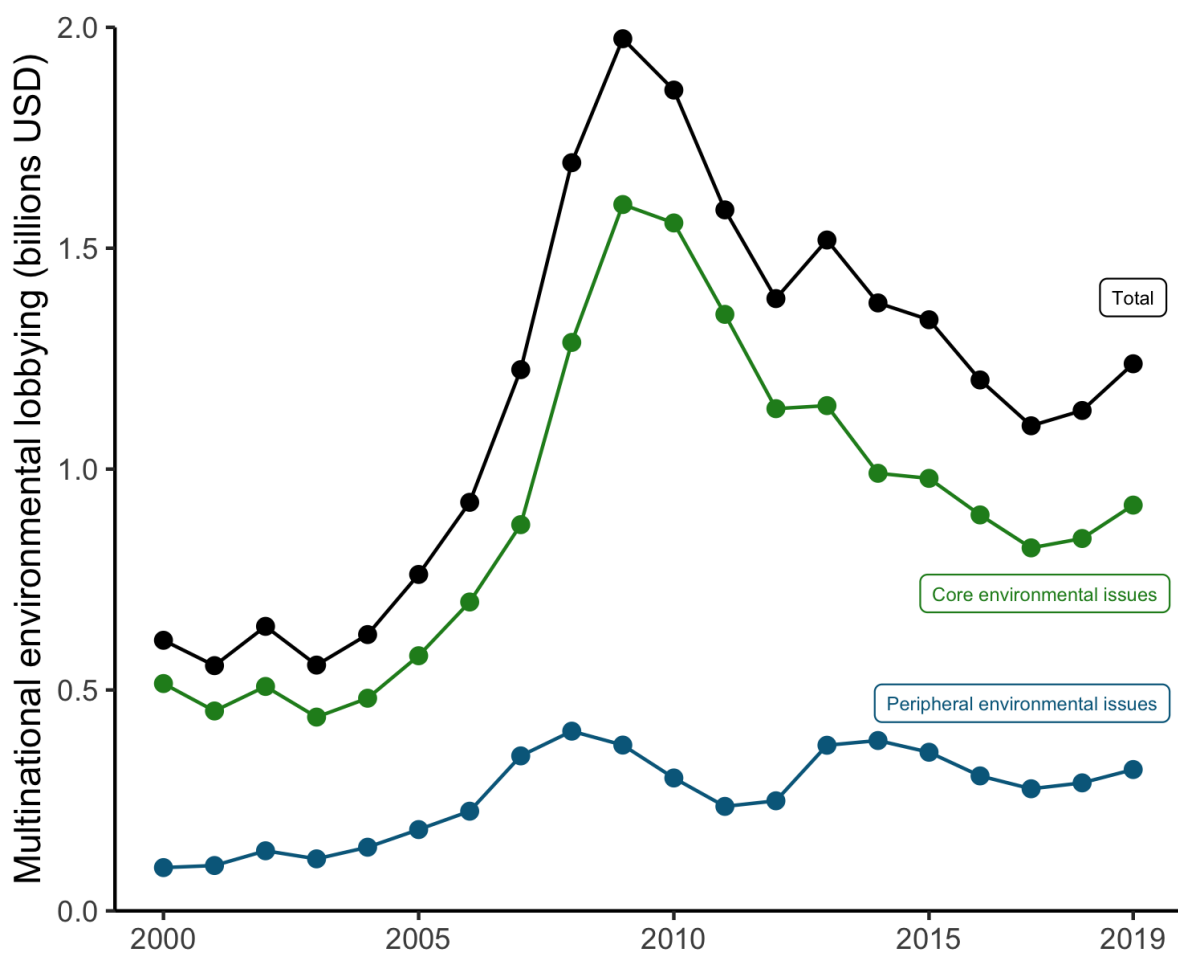


Figure 3.7: Overall estimated environmental lobbying expenditures across all topics per year, 2000–2019.

²⁷An average of \$90.3 million USD per traditional environmental issue and \$52.4 million USD per secondary environmental issue.

Figure 3.8 displays the geographical distribution of environmental advocacy activities by multinational S&P 500 firms in 2019. Countries are colored according to the estimated total amount of lobbying funds spent on all environmental issues across all firms per \$1 billion of GDP.²⁸ The median estimated amount of lobbying funds spent was \$1883 USD per million GDP, but this distribution was highly skewed.²⁹ Just ten countries, led by Singapore, New Zealand, and Ireland, account for 39% of the global estimated total of environmental lobbying funds. Similarly, 20% of countries receive 74% of all environmental lobbying funds. The regions with the least environmental lobbying are North Africa, Central Africa, and Central Asia.

²⁸S&P 500 firms that have performed corporate tax inversions have small outposts in tax havens, likely inflating lobbying estimates in these countries. This tendency is most clear with the lobbying estimates for Luxembourg, which are an order of magnitude larger than any other country. Accordingly, I omit Luxembourg from the calculations provided in this section.

²⁹The distribution of firms' estimated environmental lobbying expenditures is also skewed. 90% of multinationals' spending on environmental lobbying comes from 60 firms in the S&P 500, with 50% of spending generated by just eleven firms. From 2000 to 2019, the top spenders on environmental lobbying were Exxon Mobil (12.1%), Dow (5.4%), Chevron (5.0%), PepsiCo (4.4%), and Ford (4.1%).

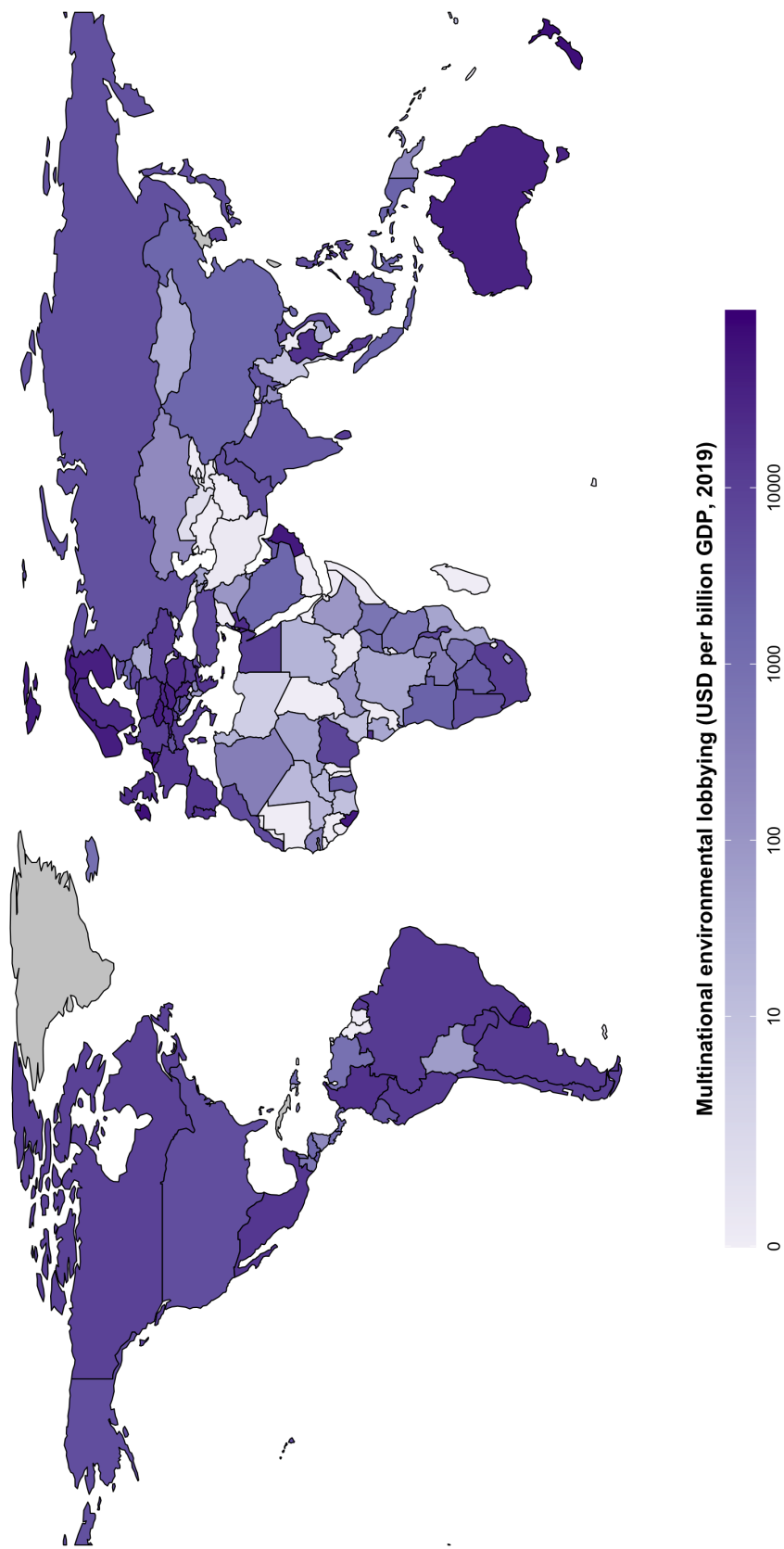


Figure 3.8: Geographical distribution of estimated lobbying expenditures on environmental topics by multinational corporations, 2019. Darker colors indicate higher estimated expenditures. Expenditures are expressed as Dollars per \$1 billion Gross Domestic Product (Constant 2010 \$). Countries with missing data are indicated in grey.

3.6.5 Relationships between and among transnational advocates

Transnational advocacy organizations engage in their advocacy activities strategically, taking into account the actions of other advocates. With this observation in mind, I aggregate the activities of transnational advocates within each type (NGO, IDO, and multinational) because I expect advocacy to have a larger impact on policy leadership when more advocates are present. When more international environmental NGOs and IDOs are in a country, they are likely to specialize and engage policymakers on a broader set of topics. Both NGOs and IDOs maintain ongoing dialogue among their counterparts to facilitate coordination. And when there is a strong presence of multinational corporations in a country, the amount of information flows across countries and potential for coordination in advocacy seems likely to strengthen. In the context of environmental policy, these actors have disagreements with each other about the merits of specific environmental policies and desirable policy settings. However, they all share the common objective of fostering greater environmental policy leadership. In Chapter 5, I will examine the potential for these within-type synergies (i.e., non-linearities).

There is also clear potential for cross-type synergies. International environmental NGOs and IDOs frequently collaborate, such as when the United Kingdom, Norway, and The Nature Conservancy worked together to build capacity for forest governance in Indonesia in the early 2000s (Bernstein and Cashore 2012). There is also potential for “bootlegger and Baptist” coalitions among civil society and private sector organizations on topics like illegal logging (DeSombre 2000). There are even initiatives that bring all three types of transnational advocates together under a single banner, such as the World Resources Group 2030, an initiative promoting access to water co-founded by, among others, PepsiCo, the Swiss Agency for Development and Cooperation, and the World Wildlife Fund.³⁰ In Chapter 5, I will examine the potential for these cross-type interactive effects.

³⁰<https://www.2030wrg.org/about-us/partners/>, accessed on November 1, 2019

3.7 Conclusion

The point of departure for this chapter is the idea that transnational advocates are agents of policy change, affecting both the adoption and diffusion of public policy. Embedded in a variety of organizational structures, these advocates seek to affect policymaking through activities that provide policymakers with information, build the human and financial capacity of governments to design and implement policy, and attempt to persuade policymakers to act through lobbying and pressure campaigns. In the context of environmental policy, three of the most high-profile transnational advocates are large international environmental NGOs, international development organizations, and multinational corporations. Over the past twenty years, these organizations have engaged in environmental advocacy activities in nearly every country. I anticipate that when transnational environmental advocacy activities are more intense, governments tend to adopt environmental policies more quickly and the countries in which these advocates work are more likely to form leader-follower environmental policymaking relationships.

Appendix 3.A List of large international NGOs

Table 3.A.1: Largest international environmental NGOs by revenue.

Name	2019 revenue (millions USD)
The Nature Conservancy	\$1,055.6
World Conservation Society	\$263.9
World Wildlife Fund	\$230.3
World Resources Institute	\$158.2
Conservation International	\$151.2
Greenpeace	> \$90.0*
Rainforest Alliance	\$69.5
Oceana	\$38.6
Flora and Fauna International	\$32.2
Friends of the Earth	>30.0*
Global Witness	\$11.3
Total	> \$2,130.3

All figures from 2019 annual reports or IRS Form 990s. Foreign currencies converted to USD on June 23, 2021. * Only includes revenues for international secretariat and Australia, United States, and United Kingdom chapters.

Table 3.A.2: Countries reporting development aid spending to the OECD DAC

Country	DAC status	Country	DAC status
Australia	Member	Lithuania	Non-member
Austria	Member	Luxembourg	Member
Azerbaijan*	Non-member	Malta*	Non-member
Belgium	Member	Netherlands	Member
Bulgaria	Non-member	New Zealand	Member
Canada	Member	Norway	Member
Croatia*	Non-member	Poland	Member
Cyprus	Non-member	Portugal	Member
Czechia	Member	Qatar	Non-member
Denmark	Member	Romania	Non-member
Estonia	Non-member	Russia	Non-member
Finland	Member	Saudi Arabia*	Non-member
France	Member	Slovakia	Member
Germany	Member	Slovenia*	Non-member
Greece	Member	South Korea	Member
Hungary	Member	Spain	Member
Iceland	Member	Sweden	Member
Ireland	Member	Switzerland	Member
Israel	Non-member	Thailand*	Non-member
Italy	Member	Turkey*	Non-member
Japan	Member	United Arab Emirates	Non-member
Kazakhstan*	Non-member	United Kingdom	Member
Kuwait	Non-member	United States	Member
Latvia	Non-member		

* Country also received development aid funds between 2002–2019. The European Union, Taiwan, and Timor-Leste also report to the DAC, but are omitted from this analysis.

Table 3.A.3: Multinational corporations in the S&P 500 (as of May 7, 2021)

Firm name	Firm BvD ID	Firm name	Firm BvD ID
3M COMPANY	US410417775	INVESCO LTD	BM40671R
A. O. SMITH CORPORATION	US390619790	IPG PHOTONICS CORPORATION	US043444218
ABBOTT LABORATORIES	US360698440	IQVIA HOLDINGS INC.	US271341991
ABBVIE INC.	US320375147	IRON MOUNTAIN INC	US232588479
ABIOMED INC	US042743260	J. M. SMUCKER COMPANY (THE)	US340538550
ACCENTURE PUBLIC LIMITED COMPANY	IE471706	J.B. HUNT TRANSPORT SERVICES, INC.	US710335111
ACTIVISION BLIZZARD, INC.	US954803544	JACOBS ENGINEERING GROUP INC	US954081636
ADOBE INC	US770019522	JOHNSON & JOHNSON	US221024240
ADVANCE AUTO PARTS, INC.	US542049910	JOHNSON CONTROLS INTERNATIONAL PLC	IE543654
ADVANCED MICRO DEVICES INC	US941692300	JPMORGAN CHASE & CO	US132624428
AES CORPORATION (THE)	US541163725	JUNIPER NETWORKS INC	US770422528
AFLAC INC.	US581167100	KANSAS CITY SOUTHERN	US440663509
AGILENT TECHNOLOGIES INC	US770518772	KELLOGG COMPANY	US380710690
AIR PRODUCTS & CHEMICALS INC	US231274455	KEYCORP	US346542451
AKAMAI TECHNOLOGIES INC	US043432319	KEYSIGHT TECHNOLOGIES, INC.	US464254555
ALASKA AIR GROUP, INC.	US911292054	KIMBERLY CLARK CORP	US390394230
ALBEMARLE CORP	US541692118	KIMCO REALTY CORP	US132744380
ALEXANDRIA REAL ESTATE EQUITIES INC	US954502084	KINDER MORGAN, INC.	US260238387
ALEXION PHARMACEUTICALS INC	US133648318	KLA CORPORATION	US042564110
ALIGN TECHNOLOGY INC	US943267295	KRAFT HEINZ COMPANY (THE)	US462078182
ALLEGION PLC	IE527370	KROGER CO	US310345740
ALLIANT ENERGY CORP	US391380265	L BRANDS, INC.	US311029810
ALPHABET INC.	US611767919	L3HARRIS TECHNOLOGIES, INC.	US340276860
ALTRIA GROUP, INC.	US133260245	LABORATORY CORP OF AMERICA HOLDINGS	US133757370
AMAZON.COM, INC.	US911646860	LAM RESEARCH CORP	US942634797
AMCOR PLC	GBJE126984	LAMB WESTON HOLDINGS, INC.	US611797411
AMEREN CORP	US431723446	LAS VEGAS SANDS CORP.	US270099920
AMERICAN AIRLINES GROUP INC.	US751825172	LEGGETT & PLATT INC	US440324630
AMERICAN ELECTRIC POWER COMPANY INC	US134922640	LEIDOS HOLDINGS, INC.	US203562868
AMERICAN EXPRESS COMPANY	US134922250	LENNAR CORP	US954337490
AMERICAN INTERNATIONAL GROUP INC.	US132592361	LINCOLN NATIONAL CORP	US351140070
AMERICAN TOWER CORPORATION	USMA1AD8	LINDE PLC	IE602527
AMERICAN WATER WORKS COMPANY, INC.	US510063696	LIVE NATION ENTERTAINMENT, INC.	US203247759
AMERIPRISE FINANCIAL, INC.	US133180631	LKQ CORPORATION	US364215970
AMERISOURCEBERGEN CORP	US233079390	LOCKHEED MARTIN CORP	US521893632
AMETEK INC	US141682544	LOEWS CORP.	US132646102
AMGEN INCORPORATED	US953540776	LOWE'S COMPANIES, INC.	US560578072
AMPHENOL CORP	US222785165	LUMEN TECHNOLOGIES, INC.	US720651161
ANALOG DEVICES INC	US042348234	LYONDELLBASELL INDUSTRIES N.V.	NL24473890
ANSYS INC	US043219960	M&T BANK CORPORATION	US160968385
ANTHEM INC.	US352145715	MARATHON OIL CORPORATION	US250996816
AON PUBLIC LIMITED COMPANY	IE604607	MARATHON PETROLEUM CORPORATION	US271284632
APPLE INC.	US942404110	MARKETAXESS HOLDINGS INC.	US522230784
APPLIED MATERIALS INC	US941655526	MARRIOTT INTERNATIONAL INC	US522055918
APTIV PLC	GBJE108188	MARSH & MCLENNAN COMPANIES INC	US362668272
ARCHER DANIELS MIDLAND COMPANY	US410129150	MARTIN MARIETTA MATERIALS INC	US561848578
ARISTA NETWORKS, INC.	US201751121	MASCO CORP	US381794485

ARTHUR J. GALLAGHER & CO.	US362151613	MASTERCARD	US134172551
ASSURANT INC.	US391126612	MAXIM INTEGRATED PRODUCTS INC	US942896096
AT&T INC.	US431301883	MCCORMICK & CO INC	US520408290
ATMOS ENERGY CORP	US751743247	MCDONALD'S CORPORATION	US362361282
AUTODESK INC	US942819853	MCKESSON CORPORATION	US943207296
AUTOMATIC DATA PROCESSING INC	US221467904	MEDTRONIC PUBLIC LIMITED COM- PANY	IE545333
AUTOZONE INC	US621482048	MERCK & CO., INC.	US221918501
AVALONBAY COMMUNITIES INC	US770404318	METLIFE INC.	US134075851
AVERY DENNISON CORPORATION	US951492269	METTLER TOLEDO INTERNATIONAL INC	US133668641
BAKER HUGHES COMPANY	US814403168	MGM RESORTS INTERNATIONAL	US880215232
BALL CORP	US350160610	MICROCHIP TECHNOLOGY INC	US860629024
BANK OF AMERICA CORPORATION	US560906609	MICRON TECHNOLOGY INC	US751618004
BANK OF NEW YORK MELLON COR- PORATION	US132614959	MICROSOFT CORPORATION	US911144442
BAXTER INTERNATIONAL INC	US360781620	MID AMERICA APARTMENT COMMU- NITIES INC	US621543819
BECTON, DICKINSON AND COMPANY	US220760120	MOHAWK INDUSTRIES INC	US521604305
BERKSHIRE HATHAWAY INC.	US470813844	MOLSON COORS BEVERAGE COM- PANY	US840178360
BEST BUY CO, INC	US410907483	MONDELEZ INTERNATIONAL, INC.	US522284372
BIO RAD LABORATORIES INC	US941381833	MONOLITHIC POWER SYSTEMS, INC.	US770466789
BIOGEN INC.	US330112644	MONSTER BEVERAGE CORPORA- TION	US471809393
BLACKROCK, INC	US320174431	MOODY'S CORPORATION	US133998945
BOEING COMPANY (THE)	US910425694	MORGAN STANLEY	US363145972
BOOKING HOLDINGS INC.	US061528493	MOSAIC COMPANY (THE)	US201026454
BORGWARNER INC	US133404508	MOTOROLA SOLUTIONS, INC.	US361115800
BOSTON PROPERTIES INC	US042473675	MSCI INC.	US134038723
BOSTON SCIENTIFIC CORP	US042695240	NASDAQ, INC.	US521165937
BRISTOL-MYERS SQUIBB COMPANY	US220790350	NETAPP, INC.	US770307520
BROADCOM INC.	US352617337	NETFLIX, INC.	US770467272
BROADRIDGE FINANCIAL SOLU- TIONS, INC.	US331151291	NEWELL BRANDS INC.	US363514169
BROWN FORMAN CORP	US610143150	NEWMONT CORPORATION	US841611629
C.H. ROBINSON WORLDWIDE, INC.	US411883630	NEWS CORPORATION	US462950970
CABOT OIL & GAS CORPORATION	US043072771	NEXTERA ENERGY, INC.	US592449419
CADENCE DESIGN SYSTEMS INC	US770148231	NIELSEN HOLDINGS PUBLIC LIMITED COMPANY	GB09422989
CAESARS ENTERTAINMENT, INC.	US463657681	NIKE INC	US930584541
CAMPBELL SOUP CO	US210419870	NISOURCE INC	US352108964
CAPITAL ONE FINANCIAL CORPORA- TION	US541719854	NORFOLK SOUTHERN CORP	US521188014
CARDINAL HEALTH INC	US310958666	NORTHERN TRUST CORPORATION	US362723087
CARMAX INC	US541821055	NORTHROP GRUMMAN CORPORA- TION	US800640649
CARNIVAL CORPORATION	PA16585RPP	NORTONLIFELOCK INC.	US770181864
CARRIER GLOBAL CORP	US834051582	NORWEGIAN CRUISE LINE HOLDINGS LIMITED	BM45125R
CATALENT, INC.	US208737688	NOV INC	US760475815
CATERPILLAR INC	US370602744	NRG ENERGY, INC.	US411724239
CBOE GLOBAL MARKETS INC.	US205446972	NUCOR CORP	US131860817
CBRE GROUP, INC.	US943391143	NVIDIA CORP	US943177549
CDW CORP	US260273989	NVR INC	US541394360
CELANESE CORPORATION	US980420726	NXP SEMICONDUCTORS N.V	NL34253298
CENTENE CORP	US421406317	O REILLY AUTOMOTIVE INC	US440618012
CENTERPOINT ENERGY, INC.	US740694415	OCCIDENTAL PETROLEUM CORPO- RATION	US954035997
CERNER CORP	US431196944	OLD DOMINION FREIGHT LINE INC	US560751714

CF INDUSTRIES HOLDINGS, INC.	US202697511	OMNICOM GROUP INC	US131514814
CHARLES SCHWAB CORPORATION, THE	US943025021	ONEOK INC	US731520922
CHARTER COMMUNICATIONS, INC.	US841496755	ORACLE CORP	US542185193
CHEVRON CORPORATION	US940890210	OTIS WORLDWIDE CORP	US833789412
CHIPOTLE MEXICAN GRILL INC.	US841219301	PACCAR INC	US910351110
CHUBB LIMITED	CHCHE114425464	PACKAGING CORP OF AMERICA	US364277050
CHURCH & DWIGHT CO INC	US134996950	PARKER HANNIFIN CORP	US340451060
CINCINNATI FINANCIAL CORP.	US310746871	PAYCHEX INC	US161124166
CINTAS CORP	US311188630	PAYCOM SOFTWARE, INC.	US800957485
CISCO SYSTEMS INC	US770059951	PAYPAL HOLDINGS, INC.	US492989869
CITIGROUP INC	US521568099	PENN NATIONAL GAMING INC	US232234473
CITIZENS FINANCIAL GROUP INC.	US050412693	PENTAIR PUBLIC LIMITED COM- PANY	IE536025
CITRIX SYSTEMS INC	US752275152	PEOPLE'S UNITED FINANCIAL, INC	US208447891
CLOROX CO	US310595760	PEPSICO INC	US131584302
CME GROUP INC	US364459170	PERKINELMER INC	US042052042
CMS ENERGY CORP	US382726431	PERRIGO COMPANY PLC	IE529592
COCA-COLA COMPANY (THE)	US580628465	PFIZER INC	US135315170
COGNIZANT TECHNOLOGY SOLU- TIONS CORP	US133728359	PHILIP MORRIS INTERNATIONAL INC.	US133435103
COLGATE PALMOLIVE CO	US131815595	PHILLIPS 66	US453779385
COMCAST CORPORATION	US270000798	PINNACLE WEST CAPITAL CORP	US860512431
COMERICA INCORPORATED	US381998421	PIONEER NATURAL RESOURCES CO	US752702753
CONAGRA BRANDS, INC.	US470248710	PNC FINANCIAL SERVICES GROUP INC	US251435979
CONOCOPHILLIPS	US010562944	POOL CORPORATION	US363943363
CONSOLIDATED EDISON, INC.	US133965100	PPG INDUSTRIES INC	US250730780
CONSTELLATION BRANDS, INC.	US160716709	PPL CORP	US232758192
COOPER COMPANIES INC	US942657368	PRINCIPAL FINANCIAL GROUP INC	US421520346
COPART INC	US942867490	PROCTER & GAMBLE CO	US310411980
CORNING INC	US160393470	PROGRESSIVE CORP	US340963169
CORTEVA, INC	US824979096	PROLOGIS, INC.	US943281941
COSTCO WHOLESALE CORP	US911223280	PRUDENTIAL FINANCIAL INC.	US223703799
CROWN CASTLE INTERNATIONAL CORP	US760470458	PTC INC.	US042866152
CSX CORP	US621051971	PUBLIC SERVICE ENTERPRISE GROUP INCORPORATED	US222625848
CUMMINS INC.	US350257090	PUBLIC STORAGE INC	US953551121
CVS HEALTH CORPORATION	US050494040	PULTEGROUP, INC.	US382766606
D.R. HORTON, INC.	US752386963	PVH CORPORATION	US131166910
DANAHER CORP	US591995548	QORVO, INC.	US465288992
DARDEN RESTAURANTS INC	US593305930	QUALCOMM INC	US953685934
DAVITA INC.	US510354549	QUANTA SERVICES INC	US742851603
DEERE & CO	US362382580	QUEST DIAGNOSTICS INCORPO- RATED	US161387862
DELTA AIR LINES, INC.	US580218548	RALPH LAUREN CORPORATION	US132622036
DENTSPLY SIRONA INC.	US391434669	RAYMOND JAMES FINANCIAL INC	US591517485
DEVON ENERGY CORP	US731567067	RAYTHEON TECHNOLOGIES CORPO- RATION	US060570975
DEXCOM, INC.	US330857544	REALTY INCOME CORP	US330580106
DIAMONDBACK ENERGY, INC.	US454502447	REGENCY CENTERS CORP	US593191743
DIGITAL REALTY TRUST, INC.	US260081711	REGENERON PHARMACEUTICALS INC	US133444607
DISCOVER FINANCIAL SERVICES	US362517428	REGIONS FINANCIAL CORPORATION	US630589368
DISCOVERY, INC.	US352333914	REPUBLIC SERVICES INC	US650716904
DISH NETWORK CORPORATION	US880336997	RESMED INC	US980152841
DOLLAR GENERAL CORP	US610502302	ROBERT HALF INTERNATIONAL INC.	US941648752
DOLLAR TREE, INC.	US262018846	ROCKWELL AUTOMATION, INC.	US251797617
DOMINION ENERGY, INC.	US541229715	ROLLINS INC	US510068479

DOMINO'S PIZZA, INC.	US382511577	ROPER TECHNOLOGIES, INC.	US510263969
DOVER CORPORATION	US530257888	ROSS STORES INC	US941390387
DOW INC.	US301128146	ROYAL CARIBBEAN CRUISES LIMITED	LR30002MX
DTE ENERGY CO	US383217752	S&P GLOBAL INC.	US131026995
DUKE ENERGY CORPORATION	US202777218	SALESFORCE.COM, INC.	US943320693
DUKE REALTY CORP	US351740409	SBA COMMUNICATIONS CORPORATION	US650716501
DUPONT DE NEMOURS, INC.	US811224539	SCHLUMBERGER LIMITED	CW30390NU
DXC TECHNOLOGY COMPANY	US611800317	SEAGATE TECHNOLOGY PUBLIC LIMITED COMPANY	IE480010
EASTMAN CHEMICAL CO	US621539359	SEALED AIR CORP	US650654331
EATON CORPORATION PUBLIC LIMITED COMPANY	IE512978	SEMPRA ENERGY	US330732627
EBAY INC	US770430924	SERVICENOW, INC.	US202056195
ECOLAB INC	US410231510	SHERWIN WILLIAMS COMPANY (THE)	US340526850
EDISON INTERNATIONAL	US954137452	SIMON PROPERTY GROUP INC	US046268599
EDWARDS LIFESCIENCES CORP	US364316614	SKYWORKS SOLUTIONS, INC.	US042302115
ELECTRONIC ARTS INC	US942838567	SNAP-ON INCORPORATED	US390622040
ELI LILLY AND COMPANY	US350470950	SOUTHERN CO	US580690070
EMERSON ELECTRIC CO	US430259330	SOUTHWEST AIRLINES CO.	US741563240
ENPHASE ENERGY, INC.	US204645388	STANLEY BLACK & DECKER, INC.	US060548860
ENERGY CORP	US721229752	STARBUCKS CORP	US911325671
EOG RESOURCES INC	US470684736	STATE STREET CORPORATION	US042456637
EQUIFAX INC	US580401110	STERIS LIMITED	GB09257343
EQUINIX INC	US770487526	STRYKER CORPORATION	US381239739
EQUITY RESIDENTIAL	US133675988	SVB FINANCIAL GROUP	US911962278
ESSEX PROPERTY TRUST INC	US770369576	SYNCHRONY FINANCIAL	US510483352
ESTEE LAUDER COMPANIES INC. (THE)	US112408943	SYNOPSYS INC	US561546236
ETSY, INC.	US204898921	SYSCO CORP	US741648137
EVEREST RE GROUP LTD	BM26918R	T-MOBILE US, INC.	US200836269
EVERGY, INC	US822733395	T. ROWE PRICE GROUP, INC	US522264646
EVERSOURCE ENERGY	US042147929	TAKE-TWO INTERACTIVE SOFTWARE INC.	US510350842
EXELON CORPORATION	US232990190	TAPESTRY INC	US522242751
EXPEDIA GROUP, INC.	US202705720	TARGET CORP	US410215170
EXPEDITORS INTERNATIONAL OF WASHINGTON INC	US911069248	TE CONNECTIVITY LIMITED	CHCHE114934754
EXTRA SPACE STORAGE, INC.	US201076777	TELEDYNE TECHNOLOGIES INCORPORATED	US251843385
EXXON MOBIL CORP	US135409005	TELEFLEX INC	US231147939
F5 NETWORKS INC	US911714307	TERADYNE INC	US042272148
FACEBOOK, INC.	US201665019	TESLA, INC.	US912197729
FASTENAL COMPANY	US410948415	TEXAS INSTRUMENTS INC	US750289970
FEDERAL REALTY INVESTMENT TRUST	US520782497	TEXTRON INC	US050315468
FEDEX CORP	US621721435	THE ALLSTATE CORP.	US363871531
FIDELITY NATIONAL INFORMATION SERVICES, INC.	US371490331	THE HARTFORD FINANCIAL SERVICES GROUP INC.	US133317783
FIFTH THIRD BANCORP	US310854434	THERMO FISHER SCIENTIFIC INC.	US042209186
FIRSTENERGY CORPORATION	US341843785	TJX COMPANIES INC	US042207613
FISERV INC	US391506125	TRACTOR SUPPLY COMPANY	US133139732
FLEETCOR TECHNOLOGIES, INC.	US721074903	TRANE TECHNOLOGIES PLC	IE469272
FLIR SYSTEMS INC	US930708501	TRANSDIGM GROUP INCORPORATED	US510484716
FMC CORP	US940479804	TRAVELERS COMPANIES INC.	US410518860
FORD MOTOR CO	US380549190	TRIMBLE INC.	US942802192
FORTINET INC	US770560389	TRUIST FINANCIAL CORPORATION	US560939887

FORTIVE CORPORATION	US475654583	TWITTER, INC.	US208913779
FORTUNE BRANDS HOME & SECURITY, INC.	US621411546	TYLER TECHNOLOGIES INC	US752303920
FOX CORPORATION	US831825597	TYSON FOODS INC.	US710225165
FRANKLIN RESOURCES, INC.	US132670991	UDR, INC.	US540857512
FREEMPORT-MCMORAN INC.	US742480931	ULTA BEAUTY, INC.	US384022268
GAP INC	US941697231	UNDER ARMOUR, INC.	US521990078
GARMIN LTD.	CHCHE115417272	UNION PACIFIC CORP	US132626465
GARTNER INC	US043099750	UNITED AIRLINES HOLDINGS, INC	US362675207
GENERAC HOLDINGS INC.	US205654756	UNITED PARCEL SERVICE INC	US582480149
GENERAL DYNAMICS CORP	US131673581	UNITED RENTALS INC	US061522496
GENERAL ELECTRIC COMPANY	US140689340	UNITEDHEALTH GROUP INC.	US411321939
GENERAL MILLS INC	US410274440	UNIVERSAL HEALTH SERVICES INC	US232077891
GENERAL MOTORS COMPANY	US270756180	UNUM GROUP INC.	US621598430
GENUINE PARTS CO	US580254510	US BANCORP	US410255900
GILEAD SCIENCES INC	US943047598	V. F. CORPORATION	US231180120
GLOBAL PAYMENTS INC	US582567903	VALERO ENERGY CORP	US741828067
GLOBE LIFE INC.	US630780404	VENTAS, INC.	US611055020
GOLDMAN SACHS GROUP, INC	US134019460	VERISIGN INC	US943221585
HALLIBURTON CO	US752677995	VERISK ANALYTICS, INC.	US262994223
HANESBRANDS INC.	US203552316	VERIZON COMMUNICATIONS INC	US232259884
HASBRO INC	US050155090	VERTEX PHARMACEUTICALS INCORPORATED	US043039129
HCA HEALTHCARE, INC.	US273865930	VIACOMCBS INC.	US042949533
HEALTHPEAK PROPERTIES, INC.	US330091377	VIATRIS INC.	US834364296
HENRY JACK & ASSOCIATES INC	US431128385	VISA INC	US260267673
HENRY SCHEIN, INC.	US113136595	VORNADO REALTY TRUST	US221657560
HERSHEY COMPANY (THE)	US230691590	VULCAN MATERIALS COMPANY	US208579133
HESS CORPORATION	US134921002	W. R. BERKLEY CORP	US221867895
HEWLETT PACKARD ENTERPRISE COMPANY	US473298624	W.W. GRAINGER, INC.	US361150280
HILTON WORLDWIDE HOLDINGS INC.	US274384691	WALGREENS BOOTS ALLIANCE, INC.,	US471758322
HOLLYFRONTIER CORPORATION	US751056913	WALMART INC.	US710415188
HOLOGIC INC	US042902449	WALT DISNEY COMPANY (THE)	US830940635
HOME DEPOT INC	US953261426	WASTE MANAGEMENT INC	US731309529
HONEYWELL INTERNATIONAL INC	US222640650	WATERS CORP	US133668640
HORMEL FOODS CORP	US410319970	WEC ENERGY GROUP, INC.	US391391525
HOST HOTELS & RESORTS, INC.	US530085950	WELLS FARGO & COMPANY	US410449260
HOWMET AEROSPACE INC.	US250317820	WELLTOWER INC.	US341096634
HP INC.	US941081436	WEST PHARMACEUTICAL SERVICES, INC.	US231210010
HUMANA INC.	US610647538	WESTERN DIGITAL CORP	US330956711
HUNTINGTON BANCSHARES INC	US310724920	WESTERN UNION CO. (THE)	US204531180
HUNTINGTON INGALLS INDUSTRIES, INC.	US900607005	WESTINGHOUSE AIR BRAKE TECHNOLOGIES CORP	US251615902
IDEX CORP	US363555336	WESTROCK COMPANY	US371880617
IDEXX LABORATORIES INC	US010393723	WEYERHAEUSER CO	US910470860
IHS MARKIT LTD.	BM48610R	WHIRLPOOL CORP	US381490038
ILLINOIS TOOL WORKS INC	US361258310	WILLIAMS COMPANIES INC	US730569878
ILLUMINA INC	US330804655	WILLIS TOWERS WATSON PUBLIC LIMITED COMPANY	IE475616
INCYTE CORPORATION	US943136539	WYNN RESORTS, LIMITED	US460484987
INGERSOLL RAND INC.	US462393770	XCEL ENERGY INC.	US410448030
INTEL CORP	US941672743	XILINX INC.	US770188631
INTERCONTINENTAL EXCHANGE, INC.	US462286804	XYLEM INC.	US452080495
INTERNATIONAL BUSINESS MACHINES CORP	US130871985	YUM! BRANDS, INC.	US133951308
INTERNATIONAL FLAVORS & FRAGRANCES INC	US131432060	ZEBRA TECHNOLOGIES CORP	US362675536

INTERNATIONAL PAPER CO	US130872805	ZIMMER BIOMET HOLDINGS, INC.	US134151777
INTERPUBLIC GROUP OF COMPANIES INC	US131024020	ZIONS BANCORPORATION, NATIONAL ASSOCIATION	US870189025
INTUIT INC	US770034661	ZOETIS INC.	US460696167
INTUITIVE SURGICAL INC	US770416458		

497 of the 500 firms listed had at least one member of their corporate group in a different country from that of its Global Ultimate Owner. Firm BvD IDs are identification numbers provided by Bureau van Dijk.

Chapter 4

Observing Environmental Policy Leadership

Transnational environmental policy advocates work around the world, so a full understanding of their impact on environmental policy leadership requires a global-level perspective. Such a perspective necessitates, in turn, data on environmental policy change at the global level. This task is a difficult one. It requires conceptual clarity about what counts as an environmental policy, creating comparable measures of environmental policy change across countries, and access to data on the policy actions of government around the world and over time.

In this chapter, I begin by describing what satisfactory data look like for studying environmental policy leadership. I then consider prior work in this area, presenting the results of a systematic literature review of the topical, geographical, and temporal extent of existing data on environmental policy change. Based on this review, I determine that a new dataset of environmental policy adoptions is needed to study environmental policy leadership at the global level. I then describe “policy extraction,” a new approach to measuring environmental policy adoptions. Rather than following the conventional process of first defining a set of policies and then searching for instances of their adoption, I begin with a set of laws and regulations and proceed to extract latent policy ideas contained within these documents. I apply this methodology to the Food

and Agriculture Organization's (FAO) FAOLEX database, the largest compilation of national environmental laws and regulations in existence. In the final section of this chapter, I operationalize the concept of policy leadership and its constituent components of innovation and influence, presenting descriptive data on the distribution and evolution of environmental policy leadership from 1960 to 2019.

4.1 Three criteria for a satisfactory dataset of national environmental policies

Over the past two decades, researchers have repeatedly sought to create a database of national environmental policy adoptions as the empirical foundation for describing cross-national patterns of environmental policy change. I argue that for such a database to be fit for its purpose, it must meet three primary criteria: broad topical scope, global geographic breadth, and long temporal coverage. In this section, I explain each of these criteria, how they can be interpreted, and the consequences for failing to meet these criteria.

4.1.1 Topical scope

The first criterion is broad topical scope. In this context, the range of potential topics to include hinges on the researcher's understanding of the concept of "environmental policy". Environmental policy is a compound concept consisting of two parts: "environmental" and "policy." Starting with the second, more general term, I turn to [Hall's \(1993\)](#) typology of policy change. The most common kind of policy change is the selection of policy settings, which are incremental changes in how a policy is designed or implemented. A less common, but still concrete form of policy change is the selection of policy instruments, in which a government changes its approach to solving a problem but continues to act in the service of the same goal. The rarest and most fundamental type of policy change is a "paradigm shift," in which a government pursues a new set of overarching objectives that it is attempting to achieve through public policy, creating subsequent changes in

policy instruments and their settings. To illustrate the relationship between these types of policy change, consider a policy paradigm in which the government's objective is to reduce pollution via price mechanisms. To accomplish this goal, the government may select the policy instrument of carbon taxes, which may be designed with the policy setting of \$15 per ton of carbon emitted.

For a global policy database, it is often most appropriate to focus on policy instruments and, if possible, policy settings because policy paradigms primarily describe policymakers' thoughts and intentions, which are more difficult to measure systematically than explicit and specific policy actions. A database that includes policy settings provides the substantial benefit of enabling comparisons not just of policy adoption but also policy stringency. However, this strategy can be difficult to realize in practice because creating comparable measures of policy settings across jurisdictions requires detailed knowledge of how each policy works. For example, it is not clear how to compare the stringency of a traditional legal standard over more flexible, market-based approaches, such as permit trading schemes (Knill et al. 2012a). Policy instruments, in contrast, are well-suited to making comparisons because the adoption of a policy instrument is explicitly described in the text of a law and can be summarized via binary judgments that require less detailed knowledge than determining policy settings.

The second component of "environmental policy" is the term "environmental". Environmental policy can be defined as "tools, techniques, programs, instruments, plans, and ideas associated with the governance of ecosystems and their interactions with society" (p. 387 Pacheco-Vega 2021). This understanding takes an expansive view of what counts as an environmental issue, implying that "Every policy is environmental insofar as most policies have to deal in one way or another with natural resources, extraction, access, and conservation" (388). Thus, environmental policies include topics as diverse as coal-fired power plants, landscape restoration, and slaughterhouse hygiene. It is critical for datasets to include many different policies to account for both the probabilistic nature of policy relevance, since policies may vary in their relevance to any given government's context (Boehmke and Skinner 2012), and the probabilistic nature of advocacy, since

even the most assiduous efforts to influence policy will only work some of the time.

4.1.2 Geographic breadth

The second criterion for a satisfactory database of national environmental policy adoptions is broad geographic breadth. If the researcher aims to describe and assess global-level claims about national policymaking, it is appropriate to collect data from a broad, representative set of countries to accumulate cases of adoption for the same policy (Busch and Jörgens 2005). However, the pursuit of breadth can generate both logistical and conceptual challenges. A logistical hurdle not to be underestimated is that of language, both in terms of the dozens of languages in which policies are written and in terms of the many ways in which concepts are expressed even within the same language. For example, policies relating to artisanal farming may use terms like “peasant farming,” “subsistence agriculture,” “family farms,” and “small-scale agribusiness” to refer to the same economic activity. Such a proliferation of terminology can make it difficult to identify similar policies.

Conceptually, the ramifications of enacting any given policy depend on formal institutions and informal policymaking styles. This dynamic can be seen in policymakers’ tendency to design relatively narrow or broad policies. When governments create narrow and specific rules, even routine adjustments to policy settings require formal policy changes. In one such instance, the Belgian government was obliged to amend its policy on maximum pesticide residues on food no less than 24 times between 2000 and 2008.¹ When governments create broad and vague rules, they give regulators the flexibility to change policy settings, and even adopt policy instruments, without requiring formal regulatory or legislative action. Perhaps the most famous example of such a law in the environmental context is the United States’s Clean Air Act, which has been interpreted to empower agencies to act on climate change in the absence of climate-specific enabling legislation. In considering such a wide array of policymaking processes, the researcher needs to be aware that laws and regulations, and the frequency with which they change, can have

¹The original policy was adopted on March 13, 2000 as the “Royal decree fixing the maximum levels for pesticide residues authorized on and in foodstuffs.” The policy was repealed in 2008.

different meanings in different countries. Of course, the alternative of collecting data from fewer jurisdictions would require the researcher to make stronger assumptions about the extent to which their results can be attributed to other contexts.

4.1.3 Temporal coverage

The third criterion is that information is collected over a long period of time. A database of environmental policies must not only include laws and regulations currently in force, but also policies that were amended and repealed. As a result, current statutes and regulations provide only an incomplete picture of policy change. A further complication is that laws can continue to have effect from one political regime to the next. These holdover policies may be especially likely to be the case for more technical aspects of resource management and manufacturing, as such issues tend to be relatively low profile.

It can also be challenging to access the actual policy texts, both old and new. Some countries have not completely digitized their policy archives, and others do not have complete collections of even their current laws and regulations on the web. In the context of policies regulating the manufacture and distribution of plastic bags, for instance, I successfully located online versions for only 88 of 149 relevant policies. These dynamics mean that researchers face a substantial risk of selection bias, since wealthier countries may be more willing to pay the cost of digitization and maintenance of online policy archives. Researchers may also be driven to higher-profile (and thus unusual) policies, such as policies on climate change, that are more likely to be accessible online.

4.2 A systematic assessment of the topical, geographic, temporal scope of existing data on national environmental policies

Researchers have conducted many comparative studies of environmental policy change over the past several decades, but it remains difficult to collect data on environmental

policy adoptions across a wide range of topics, countries, and time periods. Early studies on environmental policy innovation examine case studies of developed European countries like Germany, the Netherlands, and Sweden (e.g., [Héritier 1995](#); [Andersen and Liefferink 1997](#)) or subnational governments in the United States, especially California ([Vogel 1997](#)). Over time, scholars have broadened the geographical scope of their analyses, first comparing among developed countries (e.g., [Kern et al. 2001](#); [Tews et al. 2003](#); [Busch and Jörgens 2005](#)) and then to Eastern Europe and rapidly industrializing countries ([Holzinger et al. 2008a](#); [Liefferink et al. 2009](#); [Sommerer and Lim 2016](#)). As a result of this progression, the bulk of the literature has focused, and continues to focus, on developed countries, especially those in Western Europe ([Sommerer and Lim 2016](#)). In recent years, scholars have started to move toward analyses at the global level, but these studies are still restricted to the analysis of only one or a few policies (e.g., [Saikawa 2013](#); [Stadelmann and Castro 2014](#)).

To assess the extent to which existing cross-national databases on environmental policy meet the criteria of broad topical, geographic, and temporal breadth, I conducted the first systematic review of data used in quantitative multi-country studies of national environmental policy adoption. In my review, I identified 28 relevant studies in a two-step process. First, I conducted keyword searches on Google Scholar using permutations of the search: “policy” AND “environmental” AND “national” AND “adoption” AND (“leadership” OR “diffusion” OR “convergence” OR “transfer”). I retained studies that examined the adoption of one or more specific environmental policies in at least nine countries as a key dependent or independent variable. Second, I supplemented these results by following citations to other relevant studies. I reached saturation in my data collection, meaning that conducting more searches would no longer yield additional relevant results. A list of studies included in the review is provided in Appendix 4.A. I then coded each article according to the number of environmental topics addressed, the number of countries included, and the number of years examined. Finally, I merged duplicate and near-duplicate policies, yielding 120 unique environmental policies studied in 195 unique countries for varying periods between 1945 and 2019.

4.2.1 Existing data have limited topical scope

Comparative research on environmental policy adoption has been “particularly prone to scrutinizing cases of explosive diffusion” (p. 62 Knill et al. 2014). Market-based instruments like greenhouse gas cap-and-trade schemes and taxes have been particularly popular objects of study (Jordan et al. 2003; Tews et al. 2003; Bomberg 2007), as have environmental ministries, access to environmental information laws, and other basic environmental procedures and frameworks (e.g., Frank et al. 2000; Tews et al. 2003; Prakash and Potoski 2006). Many scholars do not justify or explain the extent to which the policies examined are faithful representations of other kinds of environmental policies. For example, Frank et al. (2000) study the adoption of environmental ministries and extrapolate from their results to conclusions regarding all of the natural environment.

Figure 4.1 shows the count of unique environmental policies in existing datasets by topic area.² A handful of topics have received most of the attention in existing cross-national studies of environmental policy change, generally relating to issues of pollution. Of 120 unique environmental policies, 60 address air or energy policy (or both), the categories that include policies to mitigate climate change. Other topics with a relatively large number of policies include waste, water, and general environmental policies (i.e., institutions, procedures, and frameworks). The ten remaining topics in the environmental policy domain have received little or no attention in prior work. Several traditional environmental policy issues, including mineral resources, fisheries, and agriculture, are not addressed by any of the studies identified in this review.

The most frequently studied policies tend to be high-profile and potentially transformational relative to most environmental policies. Policies like feed-in tariffs for renewable energy (included in 12 papers) and renewable portfolio standards (11 papers) are often the subject of exceptional levels of attention and drama, so their policymaking and diffusion processes are likely to be unusual, as well (Torney 2019). In light of the narrow topical breadth of the existing literature, it is not clear whether conclusions based on examinations of high-profile issue areas, such as air pollution, climate change, energy,

²I use the fifteen environmental topics provided by the FAO’s FAOLEX database.

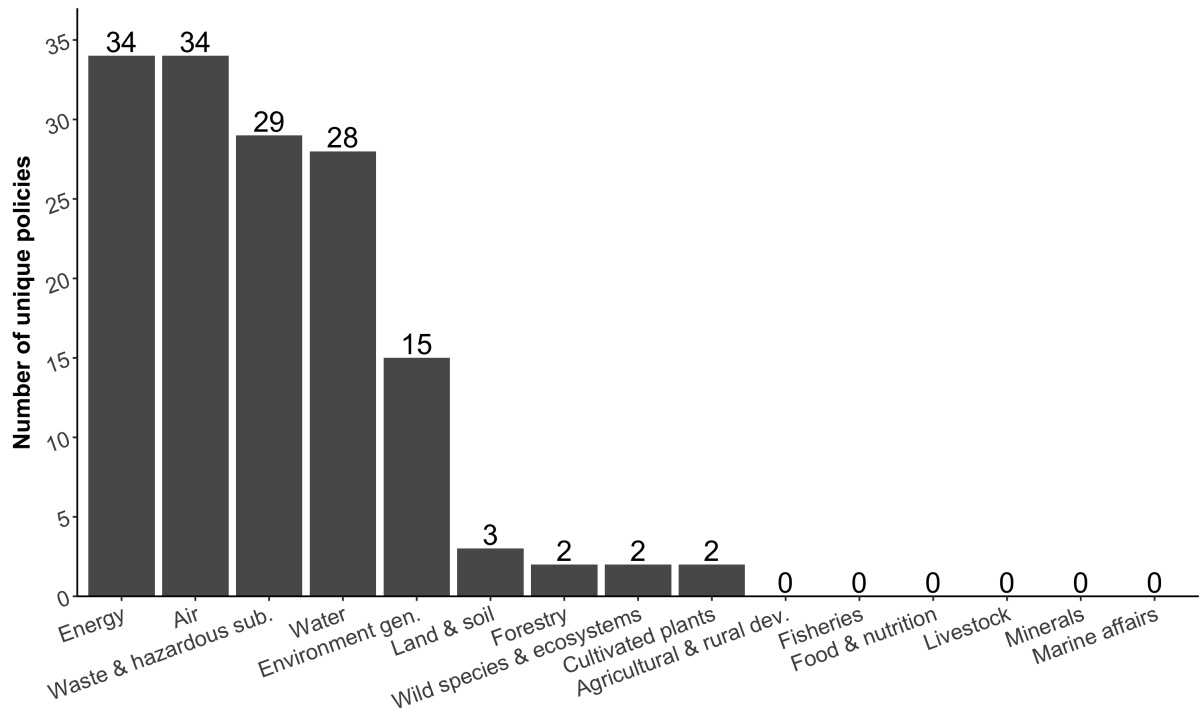


Figure 4.1: Distribution of existing environmental policy data by topic.

120 policy innovations collected from 28 papers on environmental policy adoption. Counts do not add to 120 because some policies relate to multiple topics.

and environmental institutions and procedures, extend to other topic areas, such as land use, fisheries management, and agriculture. Should an analyst attempt to use the data collected in existing work to draw conclusions about environmental policy as a whole, it seems likely that there would be a high risk of sample bias.

4.2.2 Existing data have limited geographical scope

Existing data on national environmental policy adoptions are of relatively limited geographic scope. The most widely used environmental innovation database is ENVIPOLCON (Heichel et al. 2008). Of the 24 countries in the ENVIPOLCON dataset, 21 are European and 21 have high-income economies. The successor database to ENVIPOLCON, and the largest such database to date, is GRACE (Duit and Sommerer 2013). GRACE consists of 25 policies adopted by 37 countries, of which 22 are European and 28 have high-income economies. Despite this expansion, the GRACE dataset contains no countries from Central American and the Caribbean, one country from the Middle

East and North Africa (Israel), one country from South Asia (India), and one country from Sub-Saharan Africa (South Africa). It also contains only two lower-middle-income countries and zero countries with low-income economies. The most recent addition, the CONSENSUS database (Fernández-i Marín et al. 2021), dramatically expands the number of policies considered (see discussion in the following section), but only for 21 countries in the OECD.

Figure 4.2 illustrates the geographic coverage of existing datasets, with each country colored according to its number of unique environmental policy observations. A policy is deemed to have been “observed” if the authors of at least one study in the review investigated whether it was adopted in the focal country at any given point in time.³ Considering researchers’ data collection efforts across all 120 unique environmental policies, I find a strong overrepresentation of developed countries, especially those in Europe. Developed countries, defined as member states of the OECD in 2021, average 81 of 120 possible policy observations (68%). At least one study included Austria, Germany, Ireland, Spain, Switzerland, and the United Kingdom for nearly every policy (116/120, 97%). In contrast, developing countries (non-OECD members) average only 15 of 120 possible policy observations (13%). Even large countries like Egypt and India are included in data collection efforts for only 12 and 13 unique environmental policies, respectively.

The geographic limitations of existing data on environmental policy mean that relatively little is known about the prevalence and structure of environmental policy leadership outside of high-income countries (Jordan et al. 2010). This lacuna is troubling because some countries, such as Greece, Poland, and Mexico, have received low marks for their environmental policy leadership (Knill et al. 2012a), often without acknowledging that their performance could exceed many developing countries that were never evaluated. Moreover, there is a long-running debate about developing country governments’ environmental policy leadership (e.g., Ayres 1995; Desai 1998; Steinberg et al. 2001), a debate that is difficult, and likely impossible, to resolve without systematic observation of their environmental policymaking across a wide range of topics.

³It should be noted that this approach measures the geographical scope of researchers’ data collection for each policy, not whether the policy was actually adopted.

With so little known about the dynamics of environmental policymaking in developing countries, and the potential that these processes work differently from developed countries (Baldwin et al. 2019), attempts to use existing data sources to draw conclusions about environmental policy leadership at a global level are likely to suffer from sample bias.

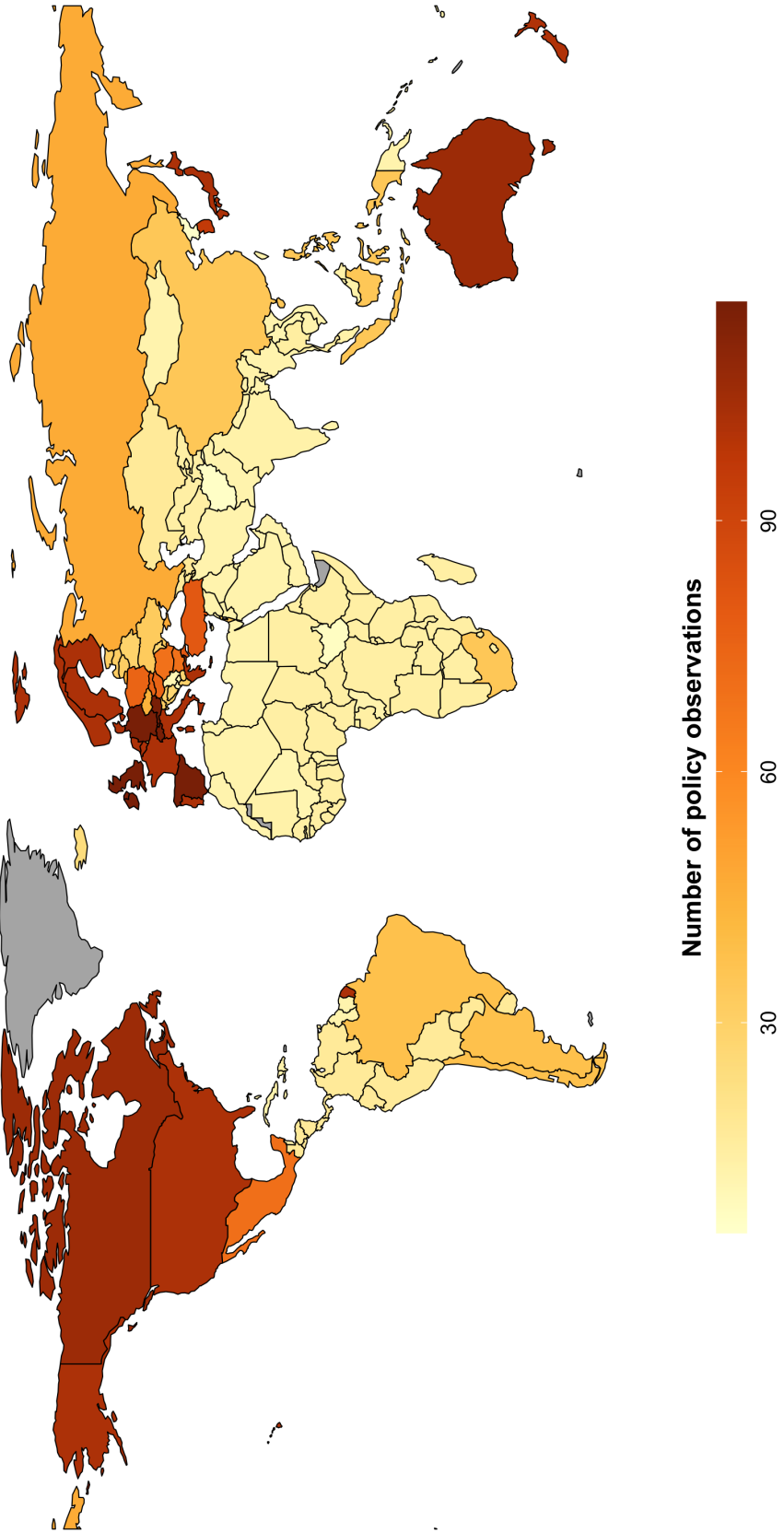


Figure 4.2: Geographical distribution of existing environmental policy data.

Darker colors indicate more policies for which a country was studied. 120 policy innovations collected from 28 papers on environmental policy adoption. Countries with missing data are indicated in grey.

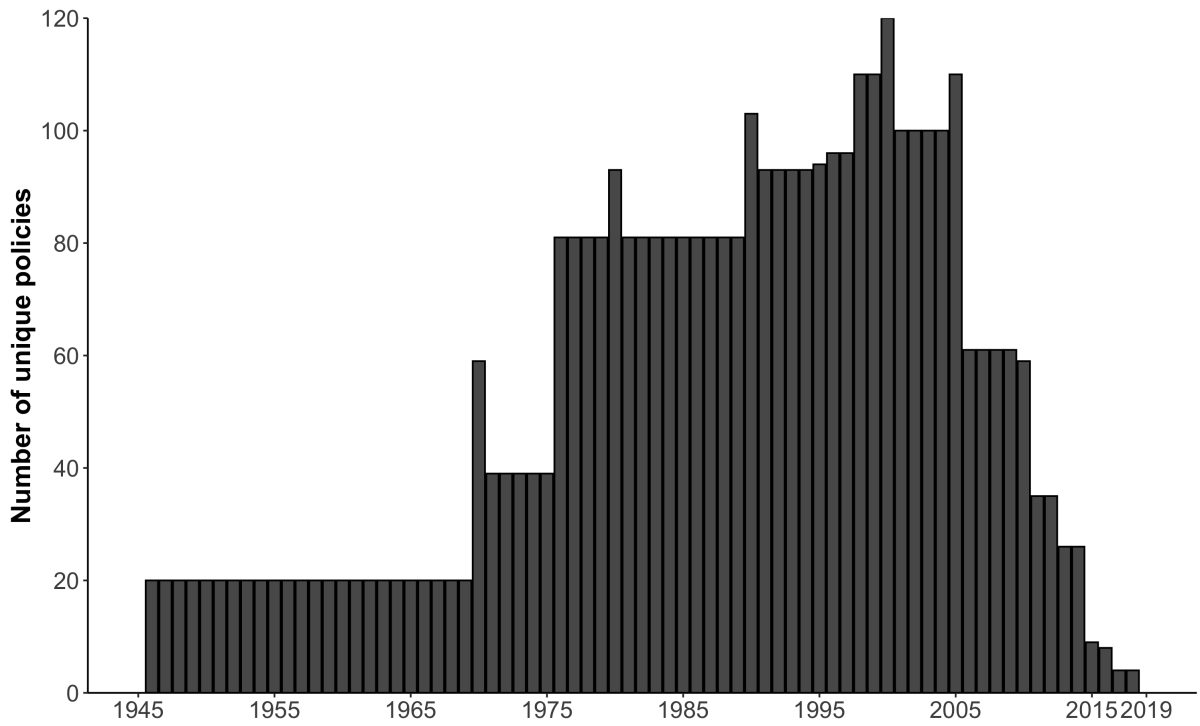
4.2.2.1 Existing data have satisfactory temporal scope

The criterion on which existing datasets perform best is temporal scope. The original ENVIPOLCON dataset was limited to observations at just four time points (1970, 1980, 1990, and 2000), but its successor, GRACE, provides an annual temporal resolution from 1970 to 2010. Even though many industrialized countries enacted early versions of their resource management and pollution control laws before 1970,⁴ starting data collection in 1970 accounts for most of the period of modern environmental governance.

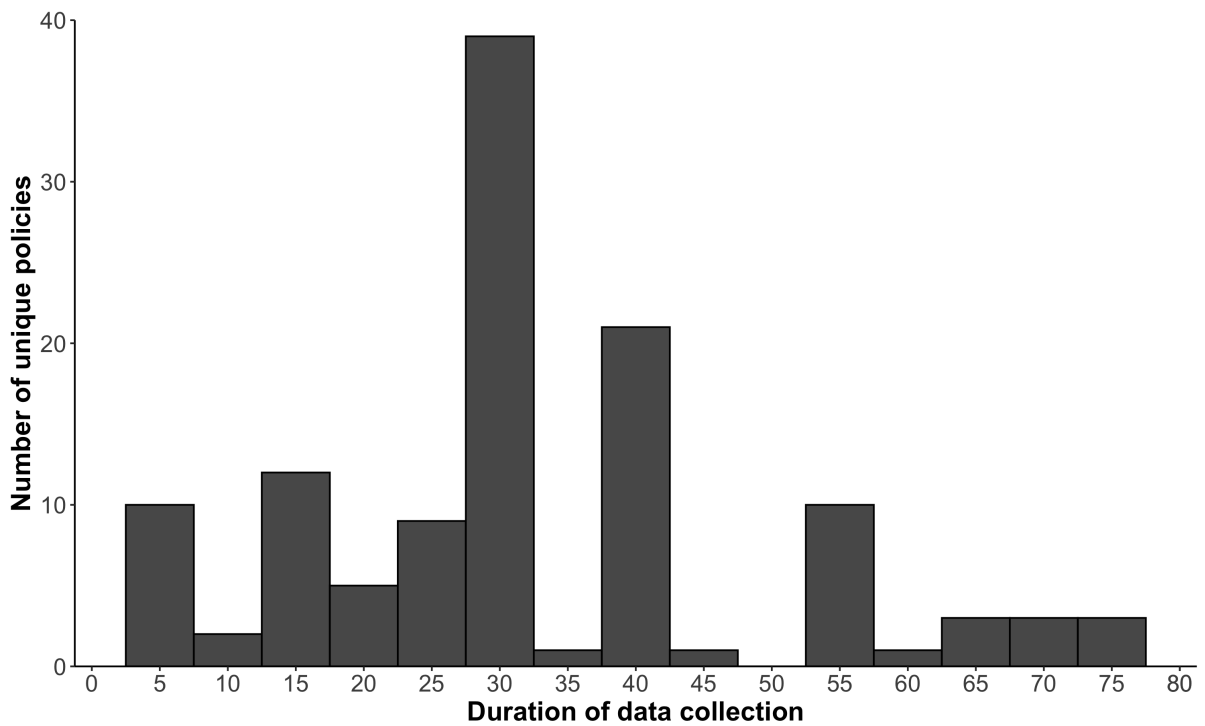
Figure 4.3a displays the number of unique policies for which any data was collected in each year between 1945 and 2019. The 28 studies in the review have expanded temporal coverage during the period 1980–2005, although there is only one year in which all 120 unique policies are observed (2000). The spikes in 1970, 1980, 1990, 2005, and 2005 reflect intermittent observations by the ENVIPOLCON dataset. Although temporal coverage decreases in recent years, it is likely an artifact of the time required for researchers to access new data and relatively long publishing timelines. Figure 4.3b shows the distribution of data collection periods. The average policy has a duration of 33 years, while the median and modal duration is 30 years. Approximately one-third of policies have data collection periods of 40 years or more.

In addition to considering the temporal scope of existing research, it is worthwhile to note that most studies do not explain their data collection process, leaving unclear how the authors selected their policy set and identified instances of policy adoption. Authors who do provide information on how they collected data on policy adoptions, such as [Holzinger et al. \(2008b\)](#) and [Massey et al. \(2014\)](#), primarily rely on expert surveys. This dependence on secondary data sources may explain why the time resolution for these datasets is at most annual, even though policies are introduced and enacted on specific dates. Further, no study explicitly considers whether policies from one regime continue to the next. This shortcoming is likely due in large part to the literature's overwhelming

⁴Examples of significant laws enacted before 1970 include land use planning in the United Kingdom (Town and Country Planning Act of 1947), national parks in France (Law of July 22, 1960 creating national parks), and a flurry of landmark legislation in the United States in the 1960s on topics including wilderness areas (the Wilderness Act of 1964), air emissions standards (the National Emissions Standards Act of 1964), solid waste disposal (the Solid Waste Disposal Act of 1965), and environmental impact assessment (the National Environmental Policy Act of 1969).



(a) Count of environmental policies with one or more policy observations by year, 1945–2019.



(b) Histogram of data collection durations for 120 environmental policies.

Figure 4.3: Temporal coverage of existing environmental policy data

focus on late-20th century European states, which have had few instances of regime change.⁵

4.2.2.2 Summary

In this systematic literature review, I examined the topical, geographic, and temporal scope of 28 cross-national studies of environmental policy change. I conclude that existing work exhibits a topical bias in favor of policies relating to pollution prevention (energy, air, water, and waste), overlooking policies relating to resource conservation, extraction, and production. I also find that prior studies have a geographical bias in favor of developed countries, especially those in Western Europe, with little data collected on environmental policymaking in the developing world. The temporal scope of the literature is generally acceptable, often starting in the 1970s or 1980s—but even this data collection period means some significant policies are omitted. Overall, the deficiencies in existing data on national environmental policy change mean that simply combining all existing environmental policy data into a single database would not be satisfactory.⁶ An alternative dataset is necessary to measure environmental policy leadership on the full range of the environmental policy domain, at a global scale, and over a long period of time.

4.3 A new global dataset of environmental policy adoptions

To overcome the geographical and topical limitations of existing data, I propose a new approach to creating a global database of environmental policy adoptions, which I call policy extraction. Conventionally, researchers have built their databases by first defining a set of policies of interest and then searching through each country's laws and regulations for a match. I reverse the order of these steps by starting with a large collection of laws

⁵These datasets do not indicate policy continuation even among late-20th century European states that experienced regime change, such as Portugal in 1974 and Spain in 1975.

⁶Boehmke et al. (2020) have undertaken a similar task in the context of American politics, but with a set of existing datasets of much broader topical and temporal scope.

and regulations and then identifying, or “extracting,” the policy idea(s) latent in each document. I explain this procedure in further detail below and then describe the new dataset, which consists of 3,000 environmental policy adoptions from 195 countries from 1887 to 2019.

4.3.1 Policy extraction: A method for transforming a collection of laws and regulations into a database of policy adoptions

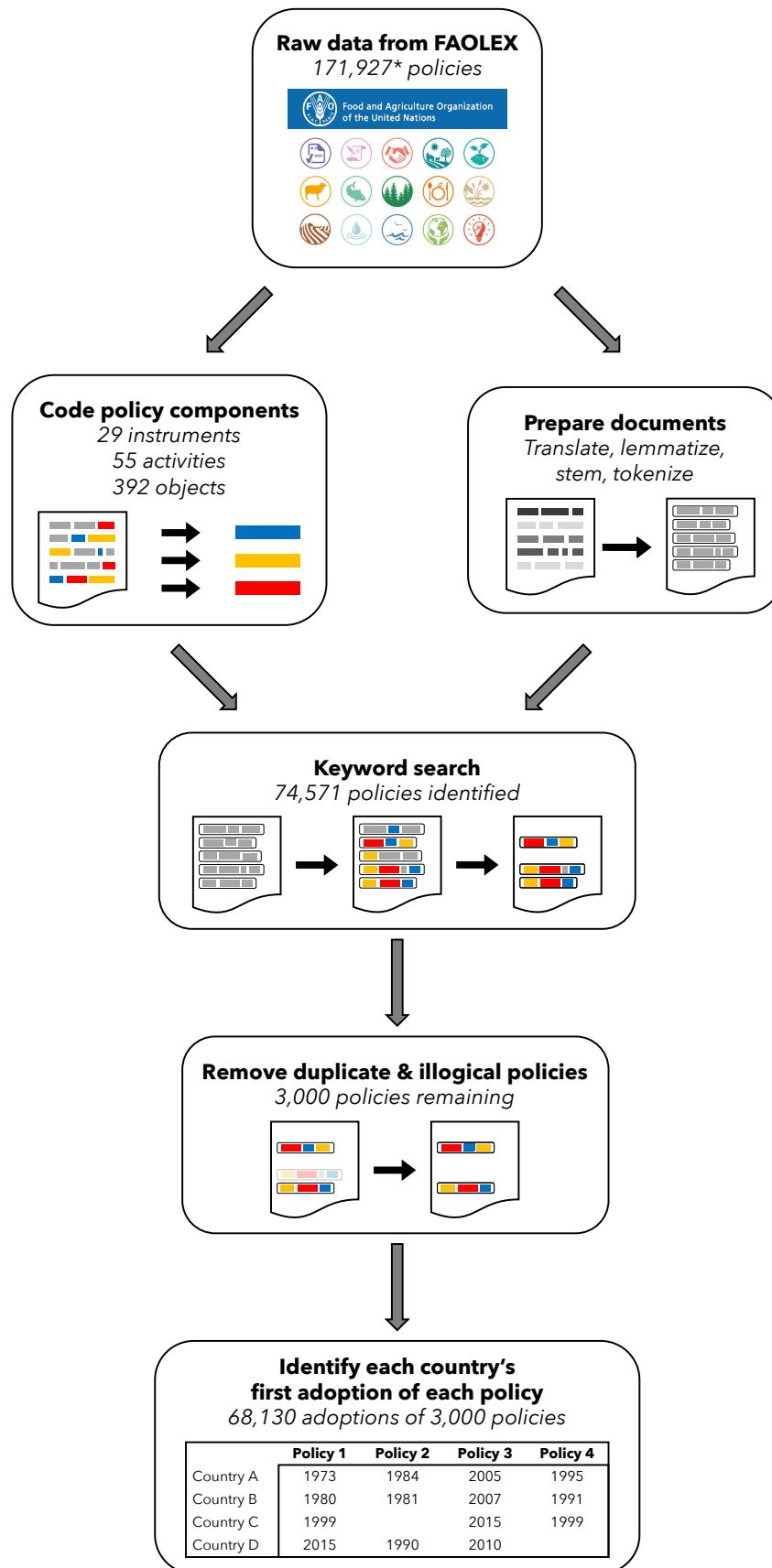
To create a new dataset with broad geographic, topical, and temporal scope, I acquired data on a large number of environmental laws and regulations, hand-coded a subset of documents to identify policy components, and then conducted a sophisticated keyword search to identify the earliest adoption of each policy for each country. Figure 4.4 provides an overview of this procedure.

The raw data for my dataset is the Food and Agriculture Organization’s FAOLEX database.⁷ FAOLEX is the most comprehensive multi-jurisdictional archive of environmental policy, and possibly of public policy, in existence. The database contains more than 170,000 environmental laws and regulations from nearly every country relating to issues across the broad spectrum of environmental policy.⁸ It is regularly maintained by subject- and country-matter experts, who examine national legislative gazettes and create database entries consisting of a policy abstract, full text, and metadata containing keywords, subjects, and cross-references to related policies. While the full texts are in many different languages and formats, the abstracts are written in English, Spanish, or French by FAOLEX staffers. Although there is variation among abstracts in length and format, their common authorship makes them easier to compare. Using Google Translate, I translated all document titles and abstracts into English.

I improve on the existing literature by proposing a novel conceptual framework for defining environmental policies. I propose that all policies consist of three components: 1) a policy *instrument* (e.g., tax, strategic plan, permitting scheme), 2) a regulated

⁷<http://faolex.fao.org/>. Accessed May 14, 2021. Data acquired March 17, 2020.

⁸Note that the database does not contain executive orders or other regulatory actions that are not reported in legislative gazettes.

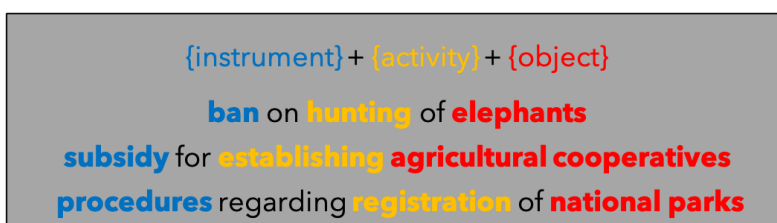


*As of March 17, 2020

Figure 4.4: The policy extraction approach, applied to the FAOLEX database

activity (e.g., hunting, manufacturing, emitting), and 3) a regulated *object* (e.g., salmon, genetically-modified organisms, greenhouse gases). Each of these components may consist of one or more sub-components. For example, the object “marine protected areas” consists of the sub-components “marine” and “protected areas.” Using this framework, a policy is defined as the combination of a policy instrument, a regulated activity, and a regulated object (see Figure 4.5). I applied this coding scheme to progressively larger random samples of policies in the FAOLEX database and stopped once the discovery rate for sub-component codes fell below one in ten documents ($N = 624$). The set of all possible combinations of instrument, activity, and object codes accounts for (nearly) all environmental policies in the FAOLEX dataset.

Figure 4.5: Illustration of policy components



Fernández-i Marín et al. (2021) propose a similar scheme consisting of policy instruments and policy “targets,” which combines regulated activities and regulated objects under a single heading. My scheme differs from that of Fernández-i-Marín and colleagues, which I learned of only after having devised my own, in that I separate regulated activities and regulated objects. This step allows me to identify a broader set of potential policies, which can then be inspected to ensure that only sensible combinations of activities and objects remain.

Next, I conducted a sophisticated keyword search of each document’s title and abstract to identify instances of policy instrument-activity-object tuples. I prepared the text for analysis by combining the title and abstract, removing numbers and punctuation, lemmatizing and stemming each word, and then tokenizing each document into sentences. Each document consisted of, on average, 5.73 sentences. To ensure that the search would include different expressions of the same latent concept, I linked each keyword with its synonyms, which I identified by calculating word vectors (Řehůřek and Sojka

2010), calculating cosine differences for each word vector relative to the focal term, and examining the twenty most similar words for conceptually similar terms.

For a given policy to be present in a document, its instrument, object, and activity tuple (or their synonyms) had to occur within the same sentence. Since sentences could reference multiple policies at once, I determined which components went together by determining whether all activities or objects in a sentence preceded or followed instruments, as this ordering was generally consistent within a sentence. I linked policy components together if an instrument immediately followed (preceded) an activity or object before the next instrument or the end of the sentence. For example, consider the sentence, “This law bans the hunting of wolves and moose, in addition to requiring licenses for hunting game animals.” Since the instrument “ban” comes first, instruments precede activities and objects in the sentence. Accordingly, the sentence contains the policies “ban-hunting-wolves,” “ban-hunting-moose,” and “licenses-hunting-game animals.”

The keyword search yielded a very large number of policies, many of which were quasi-duplicates or illogical. I took several steps to identify and remove such policies. First, I removed rare policies that occurred fewer than twelve times, a cutoff determined using a variant of the “elbow method.”⁹ Second, I removed policies that appeared in exceedingly similar sets of documents (cosine similarity above 0.9). Third, I examined all remaining policies and removed illogical policy component combinations. I deemed a policy illogical only if it was conceptually impossible (e.g., a policy cannot subsidize the slaughter of national parks because national parks are not alive). Fourth, considering my interest in national-level policymaking, I also removed policy adoptions under colonial rule and all documents missing their dates of enactment.¹⁰ I also assigned policies enacted via international agreements or regional organizations, such as the European Union, to their respective signatories.¹¹ In a final step, I identified each country’s first adoption (if any)

⁹The elbow method is a heuristic for determining the optimal number of clusters (Thorndike 1953). I implement this approach as the first instance in which the second derivative of the count of a given number of policies becomes negative as the cutoff increases.

¹⁰As noted earlier, some colonial-era laws remained in force after a country’s independence. I account for this possibility in regression analyses by noting the identity of a country’s colonizer and incorporating country-level random effects.

¹¹A future analysis could use the alternative approach of attributing policy adoption to the date of treaty ratification, rather than the date of treaty signature.

for 3,000 unique policies.

4.3.2 Strengths and weaknesses of the policy extraction approach

This procedure for creating a dataset of environmental policy adoptions has several benefits relative to conventional techniques. First, by using an inductive approach, I avoid setting arbitrary limits on the kinds of policies I can find. Rather than relying on my own capacity to imagine what policymakers might do, I focus on understanding the actions they take. Second, the approach uses primary source data—the laws and regulations themselves—to identify instances of policy change, rather than relying on second-hand sources like expert surveys. Third, provided the researcher has access to a sufficiently large set of laws and regulations, there are considerable economies of scale relative to other techniques. I can measure the adoption of thousands of environmental policies across nearly every country over a long period of time. Fourth, the keyword search procedure is more appropriate than better-known classification approaches, such as topic modeling, which are not suited to identifying fine distinctions between documents.¹²

While this approach is effective at extracting latent policy ideas from a large and diverse collection of documents, it is not without its weaknesses. First, the external validity of this approach depends on the extent to which the FAOLEX database truly contains the universe of environmental laws and regulations. The creators of FAOLEX endeavor to provide comprehensive, reliable, and up-to-date information, but it is challenging to know whether FAOLEX realizes those objectives. I attempted to estimate how comprehensive FAOLEX is for one particular policy, restrictions on the use of plastic bags, and found that FAOLEX lists 70 of the 88 policies that could be found anywhere online. While 80% coverage for online policies may be satisfactory, it is important to remember that there is actually a total of 149 plastic bag policies, so FAOLEX's true coverage for plastic bag restrictions is only 47%. While this example only looks at one

¹²For example, a topic model could be expected to identify that a given policy is about forests in general, but it would struggle to identify that the policy is a license for extracting timber. One potential avenue for improving the keyword search is to identify instruments, activities, and objects using a pre-trained question-and-answer program, such as BERT-QA. As of summer 2021, I am currently exploring the BERT-QA approach in collaboration with Patrick Wu.

particular policy, it suggests that FAOLEX does not necessarily contain the full universe of environmental policy.

A second, related consideration is that I only evaluate each policy using its title and abstract. In principle, this approach means that the most important parts of each document are provided in a single paragraph. In practice, titles and abstracts vary in length and level of detail. This variation should bias the estimated date of first adoption closer to the present because undetected policy adoptions only matter if take place before the adoption that is detected.

Third, despite automating the search process to a large degree, I was still obliged to manually identify appropriate synonyms and examine approximately 5,600 tuples of policy components to remove nonsensical combinations. It also relies on the elbow method to remove illogical or duplicate combinations, but this approach uses an arbitrary heuristic and has the undesirable effect of removing rarely observed, but perfectly sensible policies.

Despite these limitations, there are clear benefits to using the policy extraction approach. It proposes a methodology that is replicable, scalable, and easily adapted to other policy domains. As such, it allows researchers to pursue research questions relating to policy change at a greater scale than previously possible.

4.3.3 Describing a new dataset of environmental policy adoptions

Using the policy extraction methodology on the FAOLEX database, I identified each country's earliest date of adoption for 3,000 policies. Figure 4.1 shows the distribution of these 3,000 policies by topic. Of the fifteen topics in FAOLEX, the most common are Wild species & ecosystems (23.4%), General environmental frameworks/procedures/plans (13.2%), and Agricultural & rural development (11.3%). The average number of policies per issue area is 4,542 and 13 of the 15 topic areas have at least 1,000 policies, except for Air & atmosphere (314 policies, 0.5%) and Minerals (198 policies, 0.3%).¹³

¹³The FAOLEX dataset treats the Air & atmosphere and Minerals topics somewhat inconsistently. For example, Air & atmosphere is not listed as a separate topic on the front page of the FAOLEX website, but it is listed in policy metadata. Similarly, Minerals is combined with Energy on the front page of the FAOLEX website, but separated in policy metadata.

Table 4.1: FAOLEX policies by topic

	Issue type	Number of policies	Percent of total
Wild species & ecosystems	Traditional	15940	23.4%
Environment general	Traditional	9009	13.2%
Agricultural & rural development	Secondary	7669	11.3%
Food & nutrition	Secondary	6575	9.7%
Waste	Traditional	5179	7.6%
Livestock	Secondary	5044	7.4%
Cultivated plants	Secondary	4691	6.9%
Water	Traditional	3050	4.5%
Energy	Traditional	2723	4.0%
Fisheries	Traditional	2648	3.9%
Marine affairs	Secondary	2521	3.7%
Land & soil	Traditional	1329	2.0%
Forestry	Traditional	1208	1.8%
Air & atmosphere	Traditional	314	0.5%
Minerals	Traditional	198	0.3%

The 3,000 policies were adopted by 195 countries from 1887 to 2019.¹⁴ The policy extraction procedure only retained policies that occurred at least twelve times in the FAOLEX dataset, but each policy was not necessarily adopted by at least twelve different countries. Figure 4.6 shows the distribution of country adoptions by policy. This distribution is positively skewed, with each policy was adopted by an average of 23 countries and a median of 16 countries. 24% of policies were adopted by 10 or fewer countries and 14% were adopted by 40 or more countries. Only 34 policies were adopted by more than 100 countries and, likely reflecting the limitations of the FAOLEX dataset, no policies were adopted by all countries. Table 4.B.1 lists the five most widely adopted policies by topic.

The dataset includes policy adoptions as early as 1887, but the bulk of environmental policy invention and adoption occurs in the second half of the 20th century (Figure 4.7). The rate at which policymakers created new environmental policies increases starting in the 1950s, with a notable peak in 1991–1996 coinciding with the 1992 Earth Summit. The cumulative number of environmental policies also starts to rise in the 1960s and experiences a sharp upward inflection in the early 1990s. After the year 2000, relatively

¹⁴Policy adoptions before independence are omitted from this dataset, but they are retained through subsequent regime changes.

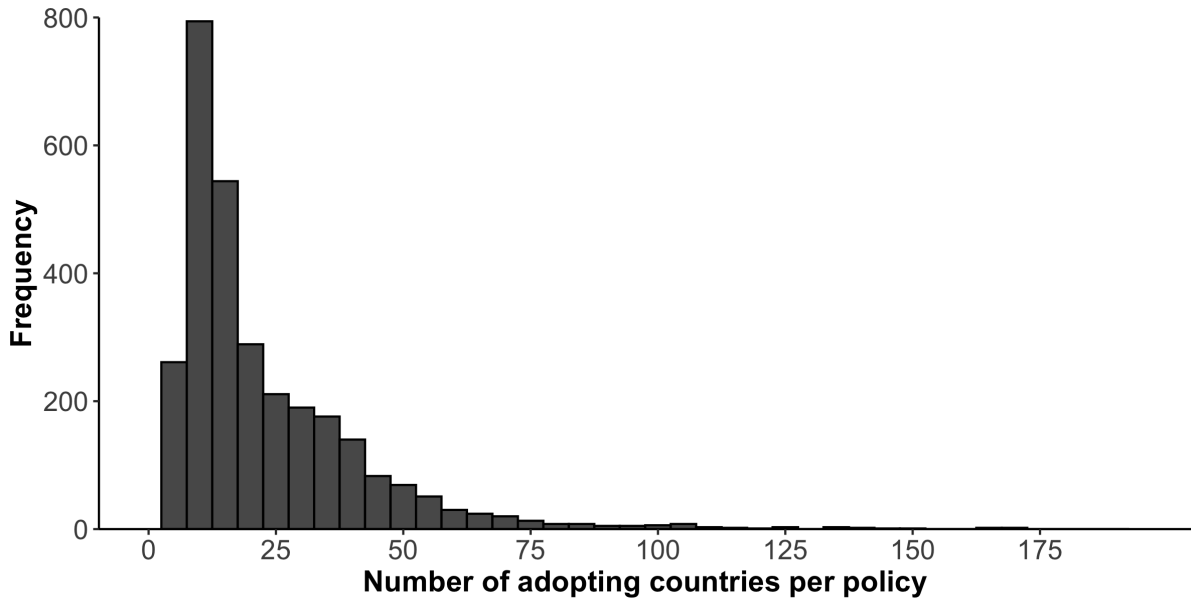


Figure 4.6: Number of adopting countries per environmental policy

few policies are invented while adoptions continue to increase. This trend suggests there was a rush of new environmental policies in the 1990s but, while these policies have continued to spread, the pace of environmental policy invention has since slowed to a trickle.

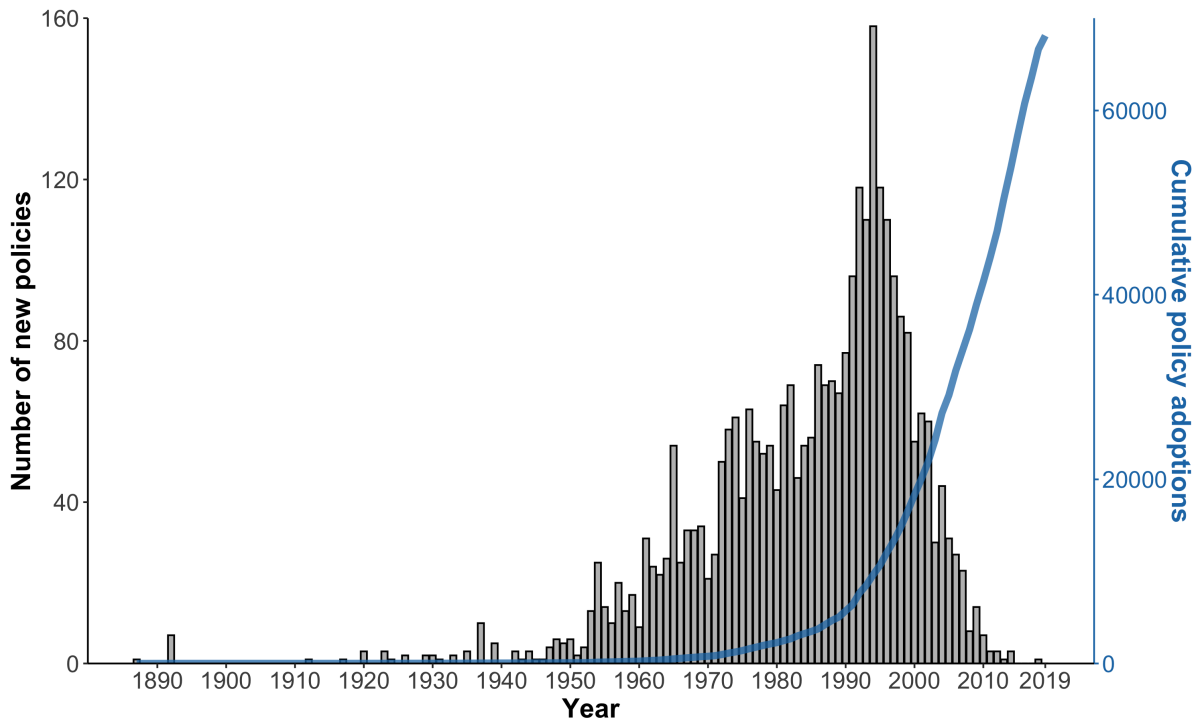


Figure 4.7: Number of new environmental policies, 1900–2019.

Figure 4.8 shows “diffusion curves,” or the cumulative percentage of adopting units

over time, by topic.¹⁵ Looking first at the average for all policies (top panel), the curve shows the conventional S-shape (Rogers 2003). In the first ten years after initial adoption, policies tend to spread slowly in a phase of early adoption. In the following 35 years, policies spread rapidly, with a peak at about eighteen years. Policies then slow their spread in the final phase of late adoption. Approximately 50 years after a policy's initial adoption, very few countries choose to adopt a policy that they have not done so already.

The bottom panel of Figure 4.8 displays variation in diffusion curves across topics. Some policy topics, such as Air & atmosphere and Fisheries reach the third phase of late adoption relatively quickly, while others, such as Land & soil and Forestry, continue to add new countries many years after their first adoption. There is no clear difference in the shape of the diffusion curves for policies relating to pollution prevention (e.g., air, energy, water, waste) relative to policies relating to resource conservation, extraction, and production.

Reversing perspective to focus on variation by country, Figure 4.9 shows the average percentage of existing policies that countries have adopted over time by region.¹⁶ Countries started to adopt more policies in the second half of the 20th century, with an inflection point in the 1990s. European countries have adopted more environmental policies than countries in other regions; as of 2019, Europe's regional average was twice that of any other region.

¹⁵These curves show the spread of a policy across potential adopters. I follow Rogers (2003) in calling these curves “diffusion” curves. Despite their name, these curves do not imply anything about whether mechanisms of policy diffusion are driving the spread of these policies.

¹⁶Since FAOLEX contains relatively few policy adoptions before 1960, the figure only shows the years 1960–2019.

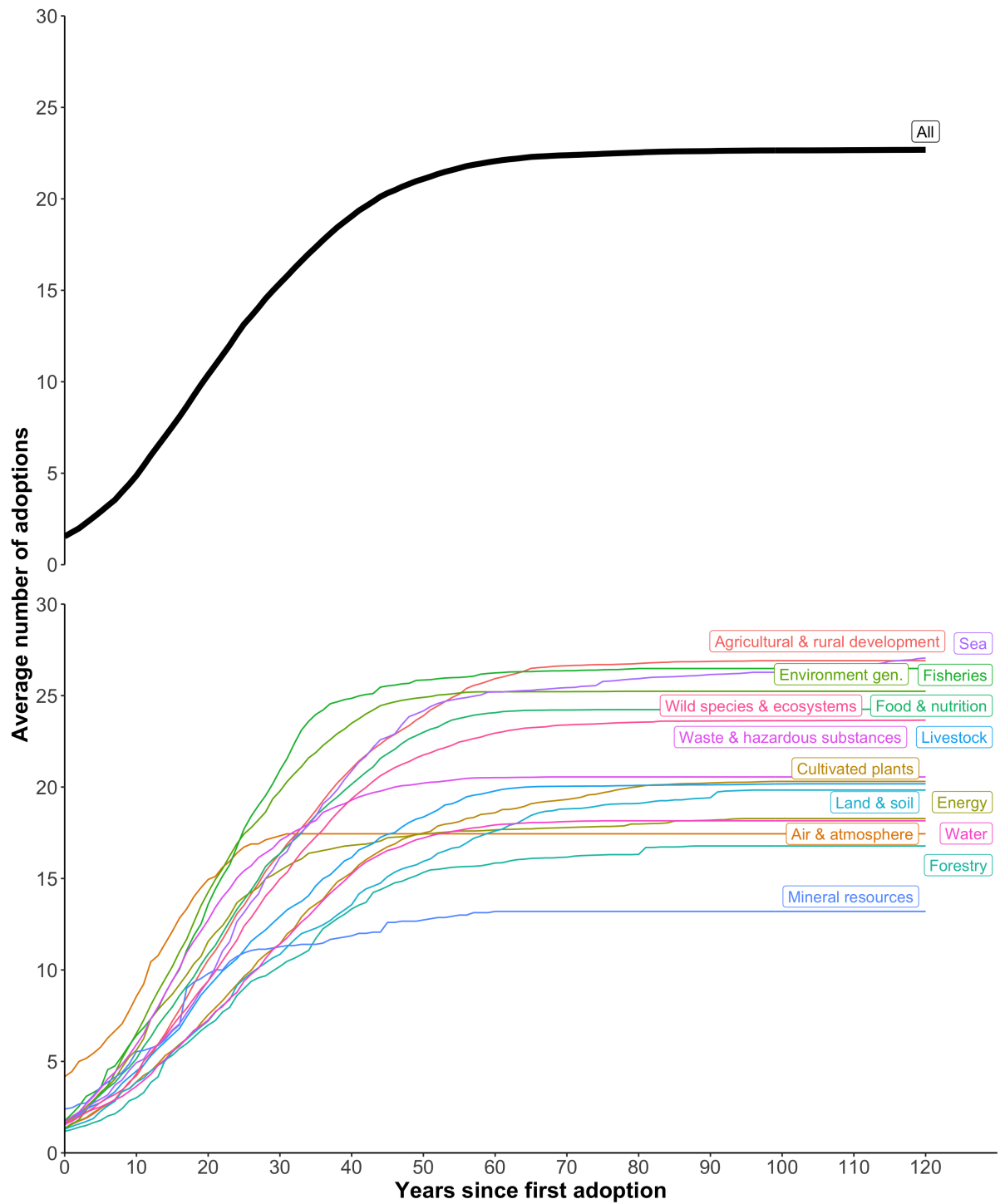


Figure 4.8: Average number of adoptions by years since first adoption.

Top panel shows the average diffusion curve for all policies. Bottom panel shows the average diffusion curves by topic.

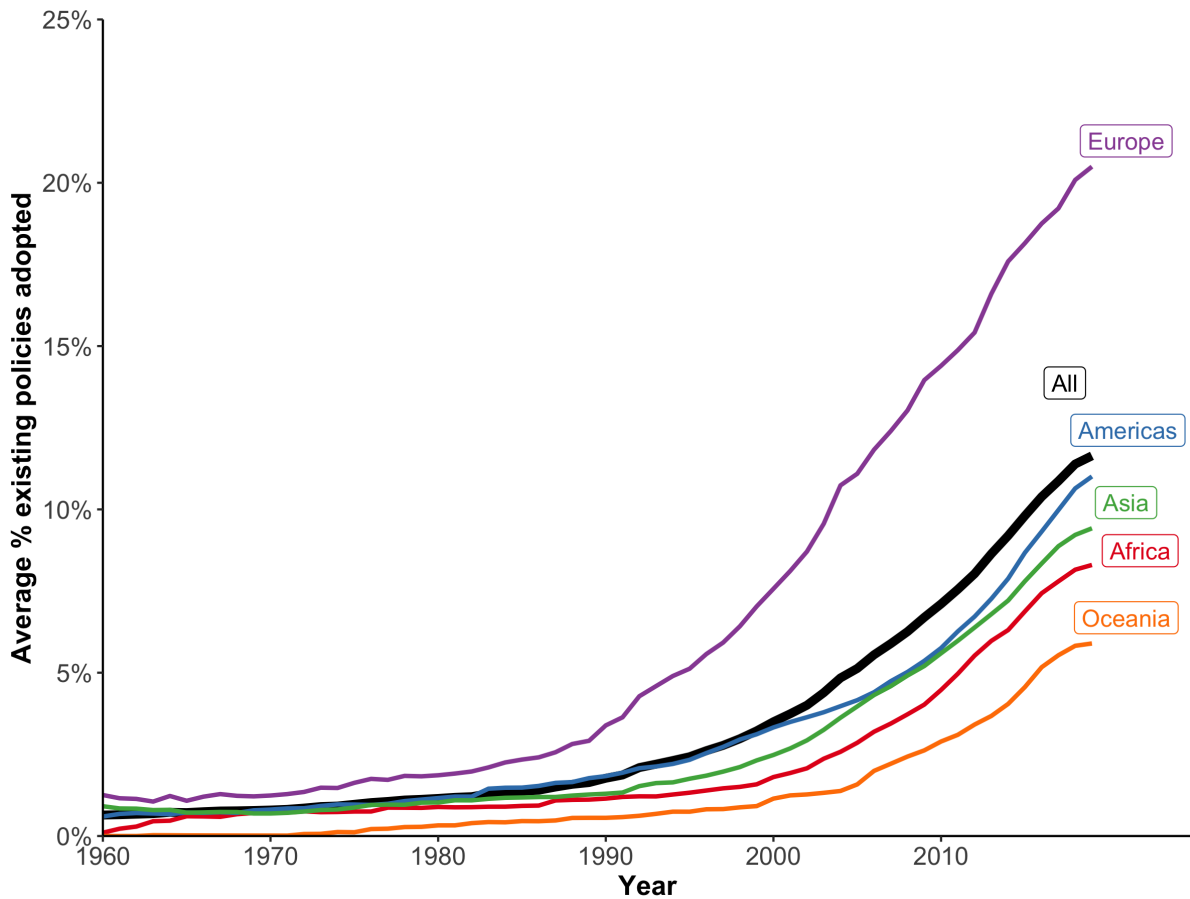


Figure 4.9: Average percentage of existing policies adopted by region, 1960–2019.

A question that has been the subject of several analyses is whether country environmental policy portfolios have become more similar over time (e.g., [Holzinger et al. 2008b](#); [Schaffrin et al. 2014](#)). A policy portfolio is the set of policies country governments have adopted at a given point in time. Following the “pair method” described by [Sommerer and Lim \(2016\)](#), I calculate the proportion of policies adopted by either country that have been adopted by both countries for each pair of countries for each year between 1900 and 2019.¹⁷ Figure 4.10 shows the average similarity of country policy portfolios between 1960 and 2019 by region, as well as the global and within-region average portfolio similarity.¹⁸ Overall, countries’ environmental policy portfolios have grown more similar over time, with any given pair of countries sharing approximately 9% of environmental policies in common as of 2019. Countries have consistently tended to

¹⁷I exclude countries before their dates of independence.

¹⁸Since FAOLEX contains relatively few policy adoptions before 1960, the figure only shows the years 1960–2019.

be more similar to countries within their geographic region. Comparing across regions, European countries have long had the most similar environmental policies, largely as a function of Europe-wide policies enacted through regional groupings like the European Union.¹⁹ Short-term spikes in regions’ environmental policy similarity are generally due to regional agreements.

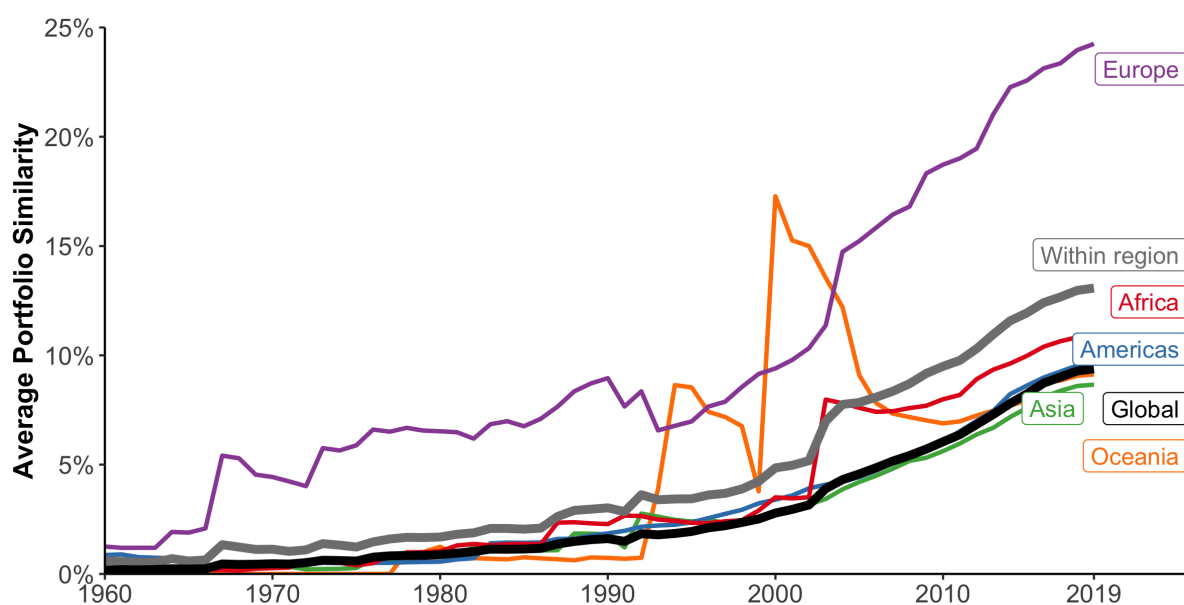


Figure 4.10: Global, within-region, and regional environmental policy portfolio similarity, 1960–2019.

4.4 Environmental policy innovation, influence, and leadership

Equipped with a global dataset of environmental policy adoptions across a wide variety of environmental topics and a long period of time, I now turn to creating a dynamic measure of environmental policy leadership, and its constituent components of innovation and influence. As discussed in Chapter 2, environmental policy leadership is the combination of innovation and a summary statistic of influence, such as the count of a country’s followers. In the following chapter, I conduct a suite of analyses to understand

¹⁹International agreements have been important influences on countries’ environmental policy portfolios. Figure 4.C.1 displays policy portfolio scores with only domestic policies, yielding lower overall similarity scores, especially for European countries.

the relationship between transnational advocacy and variation in environmental policy leadership, innovation, and influence over time.

My approach to measuring environmental policy leadership is summarized in Figure 4.11. The dataset provides the dates at which governments first adopted (if ever) a variety of environmental policies. I start by calculating policy innovation rates for each country in each year. I separately calculate influence by inferring persistent policymaking relationships between pairs of countries and then counting each country's number of followers. Finally, I combine the two measures into a single environmental policy leadership score by multiplying their percent rank in each year. I discuss each of these steps in the section below.

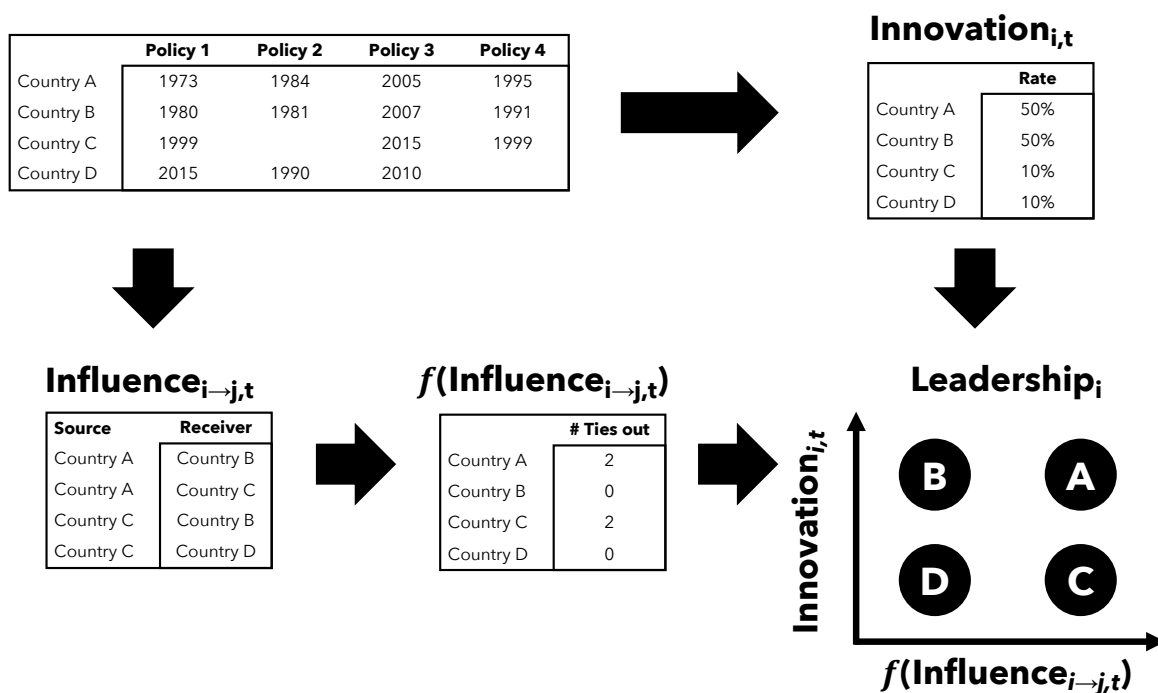


Figure 4.11: Procedure for measuring policy leadership.

4.4.1 Trends in environmental policy innovation

Policy innovation is the rate at which a government adopts available policies (Boehmke and Skinner 2012). The denominator for this rate is the set of policies available for adoption. In this context, a *policy adoption* is the first time a policy is enacted into law in a jurisdiction and policies are *available* if 1) the policy has not been adopted by the

focal government in prior years and 2) at least one other country has already adopted in the focal or prior years. The numerator is the number of policies that a government adopts in the focal year.²⁰ This approach focuses on the speed with which governments take up new policy ideas, rather than rewarding governments that are particularly inventive or governments that have already adopted many policies. I calculate innovation rates on a rolling biennial basis (i.e., including adoptions in the current and prior year) to account for policymaking processes that last for more than a single calendar year. I smooth innovation rates in the following figures using a three-year rolling average to facilitate interpretation and calculate standard errors using 1200 bootstrap replicates.

Figure 4.12 shows the overall rate of innovation in environmental policy between 1960 and 2019.²¹ This plot represents the annual rate at which countries enact environmental policies they have not already adopted, with values on the y-axis indicating the proportion of available policies that all governments enacted in each year. For example, an innovation rate of 0.5% in a given year would mean that the governments of the world adopted 0.5% of all the policies they could have, but had not yet, adopted. The figure presents an overall trend of increasing environmental policy innovation over the past 70 years, marked by two distinct phases. Before the 1990s, the rate of environmental policy innovation was relatively stagnant, hovering around 0.2%. However, environmental policy innovation started to pick up in the 1990s, coinciding with an uptick in policymaker interest in environmental issues marked by global events like the Rio Earth Summit in 1992. Increases in environmental policy innovation continued into the 21st century, reaching a peak in 2016 at 0.7%, more than three times its earlier rate. Since 2016, the rate has fallen off to some extent, but it is too early to tell if this trend is a genuine decrease or a reflection of FAOLEX's ongoing data collection. Figure 4.C.2 generally replicates these global-level trends when split into traditional and secondary environmental issues, with relatively little difference between the two categories for much of the time period.

Figure 4.13 displays three factors that may lead to systematic differences in countries'

²⁰Following Boehmke and Skinner (2012), I omit policies that started diffusing before each focal country's date of independence.

²¹Since FAOLEX contains relatively few policy adoptions before 1960, the figures in this section only display the years 1960–2019. Values are smoothed using a 3-year rolling average for presentation purposes.

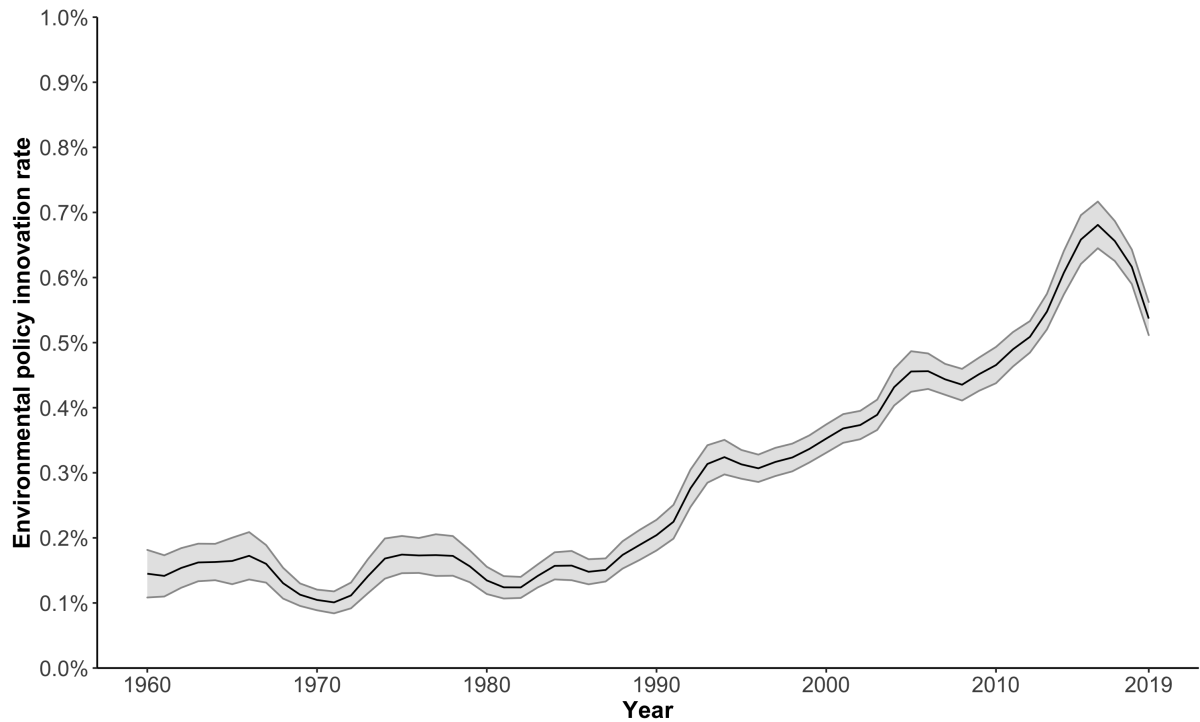
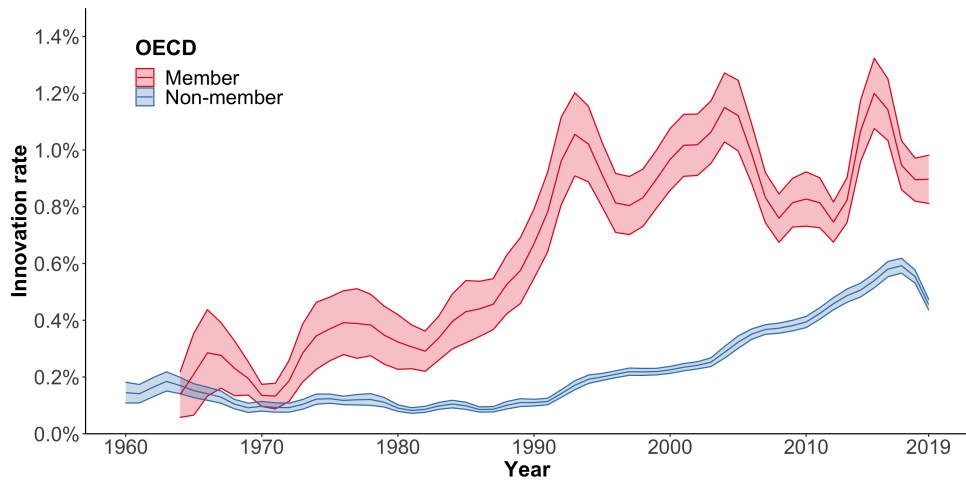


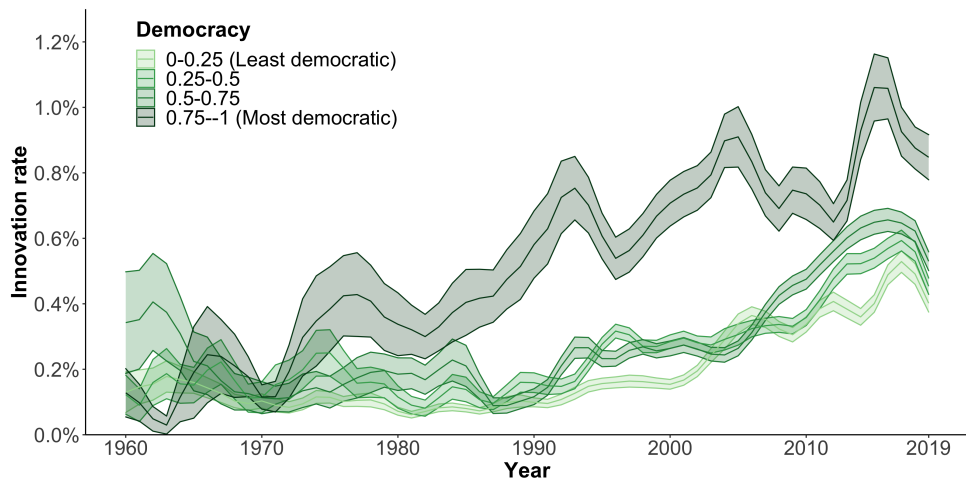
Figure 4.12: Environmental policy innovation rate for all countries combined, 1960–2019.

environmental policy innovation rates: wealth, democracy, and conflict. Starting with wealth, Figure 4.13a compares environmental policy innovation rates for OECD member states, which tend to be wealthy, and non-OECD member states, which tend to be poor. OECD member states initially had a similar rate of environmental policy innovation as non-member states but started to increase rapidly in the late 1980s and into the 1990s. Environmental policy innovation rates for OECD member states have generally hovered around 1% since the early 1990s, with lower rates in the late 1990s and the mid-2000s. In contrast, the poorer non-OECD member states have slowly but steadily increased their rates of environmental policy innovation. When non-OECD environmental policy innovation peaked in 2017 at 0.6%, it was at the same level as the average OECD state in 1989.

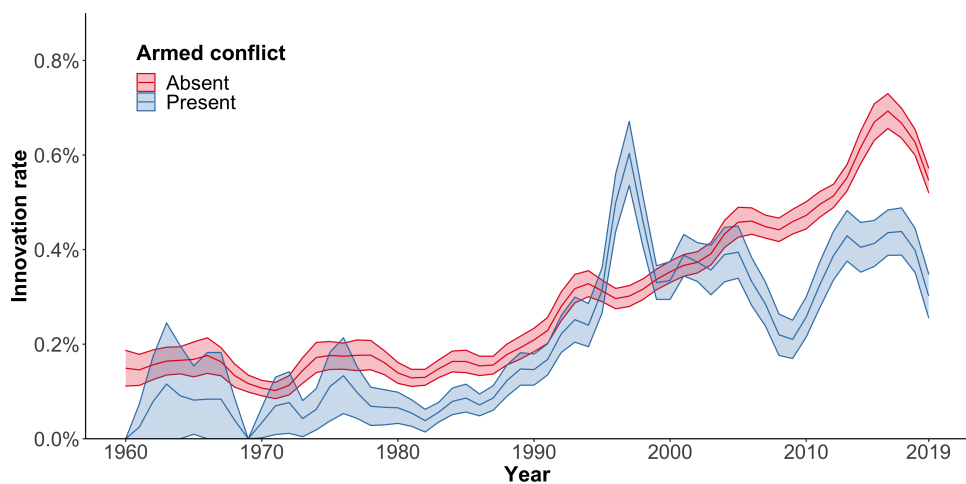
Figure 4.13b compares environmental policy innovation by countries' level of electoral democracy, measured using the Varieties of Democracy (V-DEM) project's Polyarchy index (Teorell et al. 2019; Coppedge et al. 2021). States of varying levels of democracy adopted environmental policies at similar rates until the mid-1970s, when the most democratic states increased their policy innovation rates. Other countries increased



(a) By OECD membership



(b) By electoral democracy



(c) By armed conflict

Figure 4.13: Environmental policy innovation rate by OECD membership, electoral democracy, and armed conflict, 1960–2019.

their rate of environmental policymaking more slowly, but by the mid-2000s, a positive correlation had emerged between a country's electoral democracy and its government's environmental policy innovation rate. As of 2019, the most democratic states adopt environmental policies at approximately twice the rate of the least democratic states.

Finally, Figure 4.13c compares environmental policy innovation rates in states currently experiencing major armed conflict and those that are not. Following the UCDP/PRIO Armed Conflict Dataset, countries experience "major armed conflict" when they are host to 1000 or more battle deaths in which one side is a state actor (Gleditsch et al. 2002; Pettersson and Öberg 2020). Countries at war have tended to adopt environmental policies at a slower rate than countries at peace. The one time countries at war exceeded countries at peace was in the mid-1990s, when Russia, a country with high rates of environmental policy innovation, engaged in a conflict in Chechnya. In recent years, peaceful countries have adopted environmental policies at about 1.5 times the rate of countries at war.

Table 4.C.1 shows the 5 most innovative countries in each decade. Both developing and developed countries can be found among the most innovative states. China, the United States, and Russia have been the three most innovative states over the past two decades.

4.4.2 Trends in environmental policy influence

Policy influence is a government's tendency to attract policy followers, meaning that its decisions persistently impact the policymaking processes of other governments. When these relationships persist, influential countries adopt policies ahead of their followers time and again, creating patterns in the timing of policy adoptions. Such relationships can be uncovered by looking for interdependencies in policy adoptions across many policies. I summarize a country's influence by counting the number of countries to which it acts as

a leader.²² To illustrate, if Country A serves as a leader to five countries and Country B serves as a leader to ten countries in a given year, Country B would be twice as influential as Country A.

Figure 4.14 shows the evolution of the average country's influence between 1960 and 2019, calculated as the average number of follower countries per country in the environmental policy influence network. I infer dynamic environmental policy influence networks using the NetInf algorithm over a rolling 40-year window (Linder and Desmarais 2017; Boehmke et al. 2020).²³ As with environmental policy innovation, environmental policy influence has generally increased over the past 60 years. In 1960, the average country's environmental policymaking influenced just one other country. Today, countries influence an average of approximately 19 other countries through their environmental policymaking. The trajectory of influence scores over time has an inflection point in the mid-1990s, again coinciding with a sharp increase in policy innovation rates. This trajectory is repeated when influence scores are broken down by traditional and secondary environmental issues (Figure 4.C.3), although influence scores for traditional environmental issues increased slightly earlier and more rapidly than secondary environmental issues.

Part of the reason for the steady increase in countries' environmental influence policy scores is that the number of policies in each window has increased over time (Figure 4.7). As a result, more recent years have provided governments with more occasions to exercise influence.²⁴ It is also worthwhile to note that the distribution of influence at any given time tends to be positively skewed, with a small number of countries (most notably Russia and China in recent years) influencing a very large proportion of countries and many governments that have only a handful of followers, if any.

²²One drawback of this approach is that it only considers leadership among the nodes in the policymaking network, countries in this case. In theory, such an approach could be extended to include international, supranational, and subnational jurisdictions, which can be important policy leaders across levels of government (Pacheco-Vega 2021). In practice, it would be difficult to compile a comparable and suitably comprehensive/representative database of environmental policy adoptions for so many different levels of government, especially in light of the complex relationship between lower and higher levels of government (Shipan and Volden 2006).

²³See Appendix 4.D for details on the procedure used to determine optimal window size.

²⁴Increasingly frequent policy adoption has also made it easier to detect influence relationships.

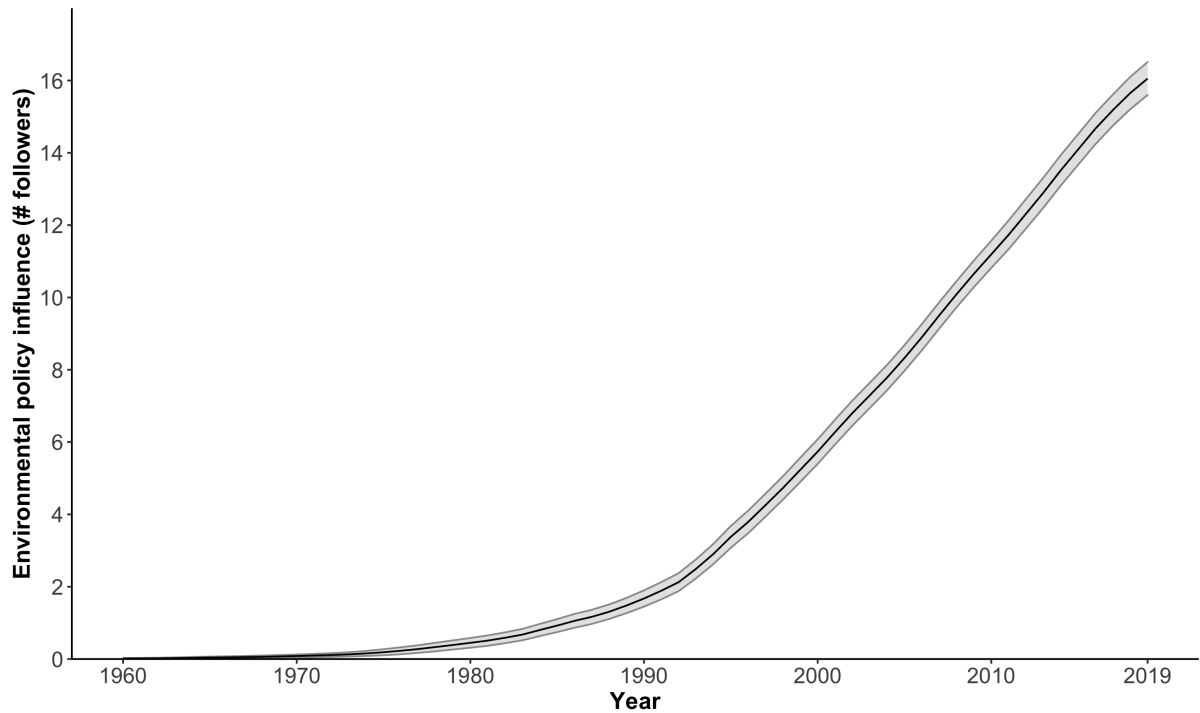
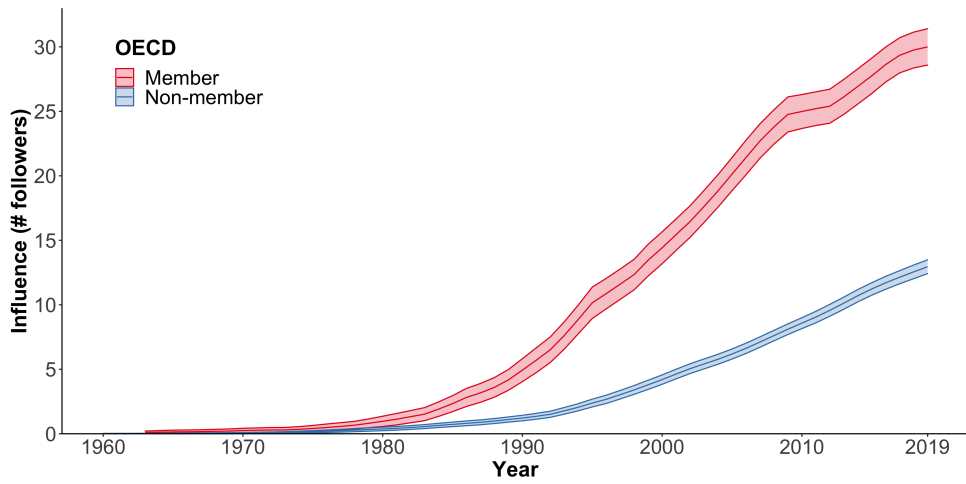


Figure 4.14: Environmental policy influence for all countries combined, 1960–2019.

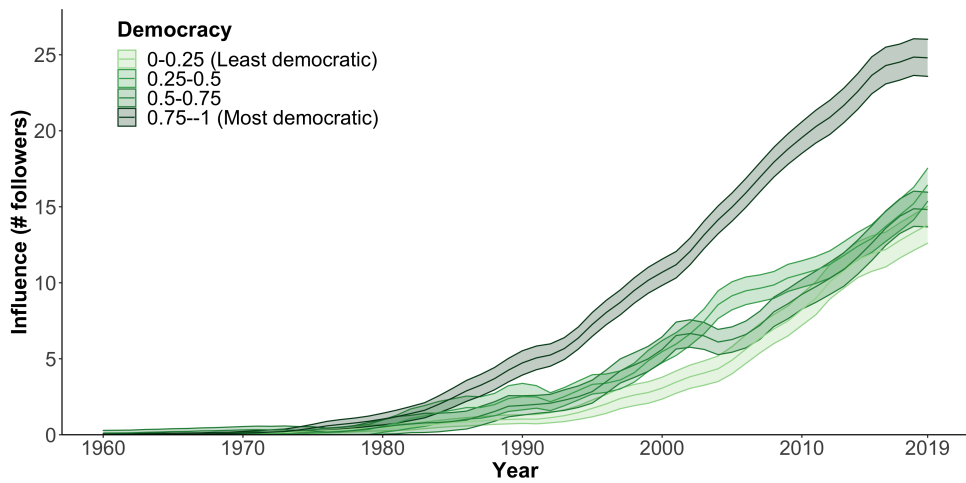
Figure 4.15 shows how countries differ in their influence by wealth, democracy, and conflict. For wealth, the comparison of OECD member states with non-member states in Figure 4.15a indicates that the wealthy OECD member states experienced a rapid increase in influence starting in the mid-1980s that continues up to the present, whereas the poorer states that are not part of the OECD have seen their influence grow much more slowly. As of 2019, the average member of the OECD influences the environmental policymaking of twice as many states as the average non-member.

Figure 4.15b compares countries' environmental policy influence by their level of democracy. The most democratic states started to become more influential than less democratic states in the 1990s and have an average of approximately 27 followers in 2019, nine more than both modestly and much less democratic countries. Unlike environmental policy innovation, there is no significant difference between modestly and less democratic states.

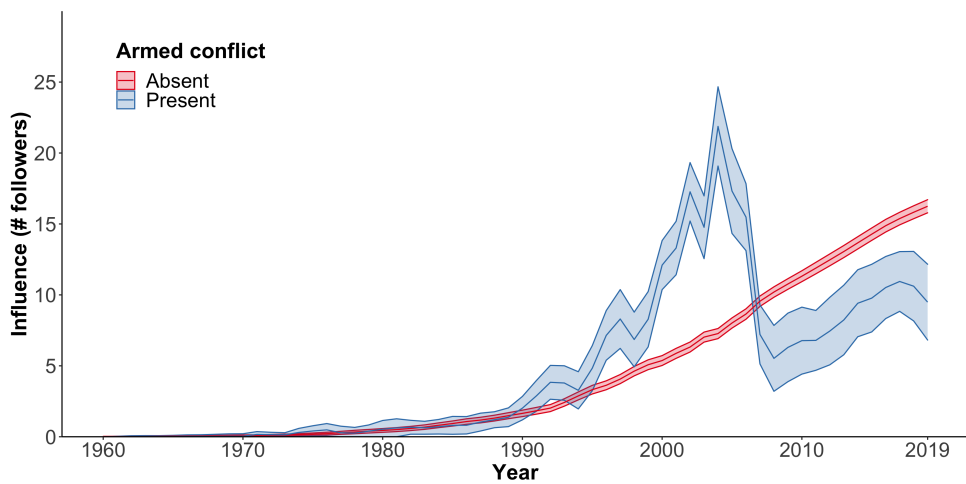
Turning to conflict, Figure 4.15c indicates that there was little difference in environmental policy influence for countries at war and countries at peace until the early 2000s, when conflicts in India (Kashmir) and Russia (Chechnya) flared up. However, in



(a) By OECD membership



(b) By electoral democracy



(c) By armed conflict

Figure 4.15: Environmental policy innovation rate by OECD membership, electoral democracy, and armed conflict, 1960–2019.

the years since, countries at war have tended to be less influential than countries at peace. As of 2019, peaceful countries have about twice as many followers as countries at war.

As with innovation, Table 4.C.2 shows that both developing and developed countries can be found among the 5 most influential countries in each decade. Russia, the United Kingdom, and, perhaps surprisingly, Italy have been among the most influential countries for environmental policy over the past thirty years. In the period 2010–2019, Russia, China, and Italy were the three most influential countries for environmental policy.

4.4.3 Trends in environmental policy leadership

As I have argued, two preconditions to measuring environmental policy leadership are the measurement of environmental policy innovation and influence. Environmental policy innovation measures the rate at which governments adopt new policy ideas, reflecting their tendency to take decisive action on environmental issues. Environmental policy influence measures the impact that domestic environmental policy changes have on the policymaking processes of other countries. In the preceding sections, I described how to capture these important concepts, which are individually necessary and jointly sufficient for environmental policy leadership. Here, I consider the two concepts together, combining innovation and influence to create a unified measure of environmental policy leadership.

Since policy leadership requires *both* rapid policy innovation and widespread influence, I multiply each country's percent rank innovation against its percent rank influence.²⁵ In Figure 4.16, I calculate percent rank for environmental policy leadership scores over the period 1960 to 2019. In parallel with the trends in environmental policy innovation and influence, the average country has increased in environmental policy leadership over time. Since countries did not often develop influence relationships relating to environmental policy until the last several decades, policy leadership remained relatively low until the 1990s, when it rapidly began to climb to a peak in the mid-2010s. This trend is

²⁵Percent rank provides a convenient method for making different measures comparable, calculating the rank of each value in a vector as the percentage of all values in that vector of an equal or lesser value. Percent rank ranges from 0 to 1, with a percent rank of 0.5 representing the median value.

generally replicated when leadership scores are considered by traditional and secondary environmental issues, with little difference in the trajectory of the two policy categories (Figure 4.C.4).

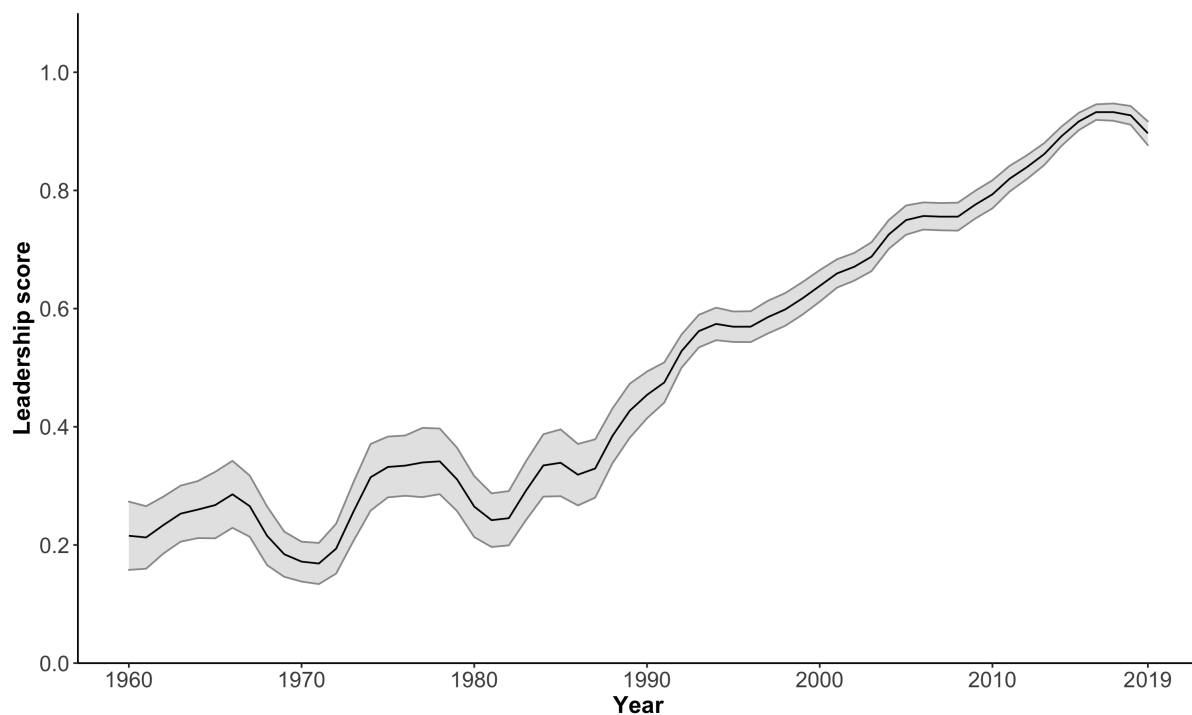


Figure 4.16: Environmental policy leadership for all countries combined, 1960–2019.

To better grasp how the components of environmental policy leadership combine in the past twenty years, Figure 4.17 plots each country’s percent rank innovation against its percent rank influence to produce an average environmental policy leadership score for the period 2010–2019. The plot’s background color indicates how the influence and innovation dimensions combine to produce the highest policy leadership score in the top-right-hand corner of the plot. Due to the large number of countries, I only label a representative selection of forty countries.

The average country’s environmental policy leadership score in 2010–2019 is 30 with a standard deviation of 28. The distribution is positively skewed (skewness = 0.81), indicating that most countries receive policy leadership scores that fall below the average and a relatively small number of countries exercise a high level of environmental policy leadership. Countries’ ranks in innovation and influence have a correlation of $\rho = 0.69$, indicating both that innovative countries also tend to be influential and that a fair number

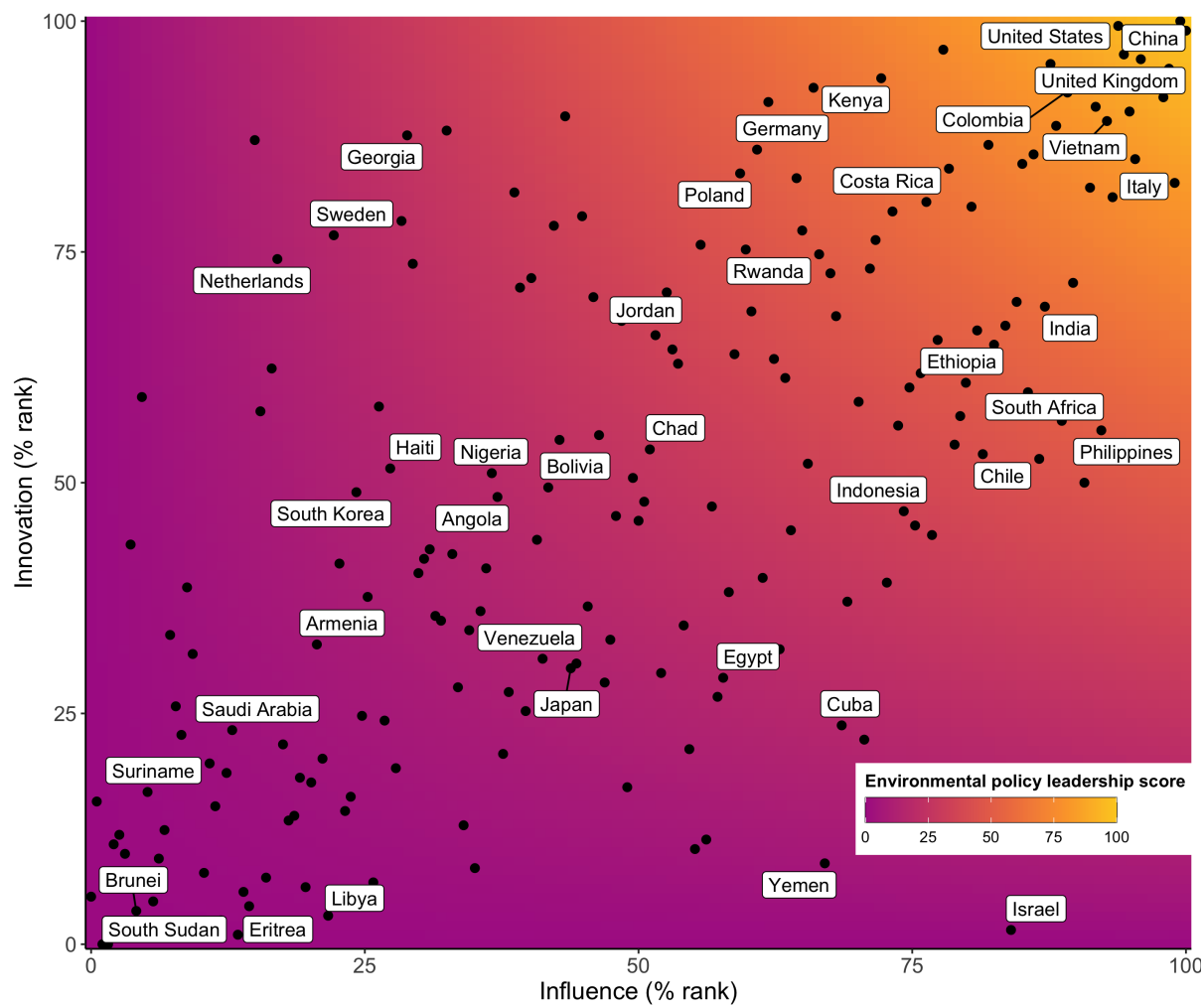


Figure 4.17: Environmental policy leadership by country (2010-2019 average).

of countries receive substantially higher scores on one dimension than the other.

Overall, many of the countries that score lowest and highest in environmental policy leadership conform to common wisdom. For example, China, the United States, and the United Kingdom are found among the environmental policy leaders of the 2010s, while South Sudan, Brunei, and Eritrea are among the laggards. However, some countries receive scores that may seem surprising, such as Japan ranking among the laggards and developing countries like Vietnam and Colombia found among the leaders. Fewer countries can be found off the leader-laggard diagonal, with only a handful of countries joining Israel and Cuba among the influencers and Georgia, Sweden, and the Netherlands among the inventors.

Figure 4.18 displays the geographic distribution of average environmental policy leadership scores between 2000 and 2019. As with policy portfolios, there is noticeable clustering of environmental policy leadership by region. Countries in North America and the Amazon countries tend to score highly, in contrast to relatively low scores in North Africa, the Middle East, and South-East Asia. There can also be sharp differences between neighboring regions. For example, countries in Southern and Eastern Africa average a score of 29, a stark contrast to the average score for countries in Central Africa, which average 18.

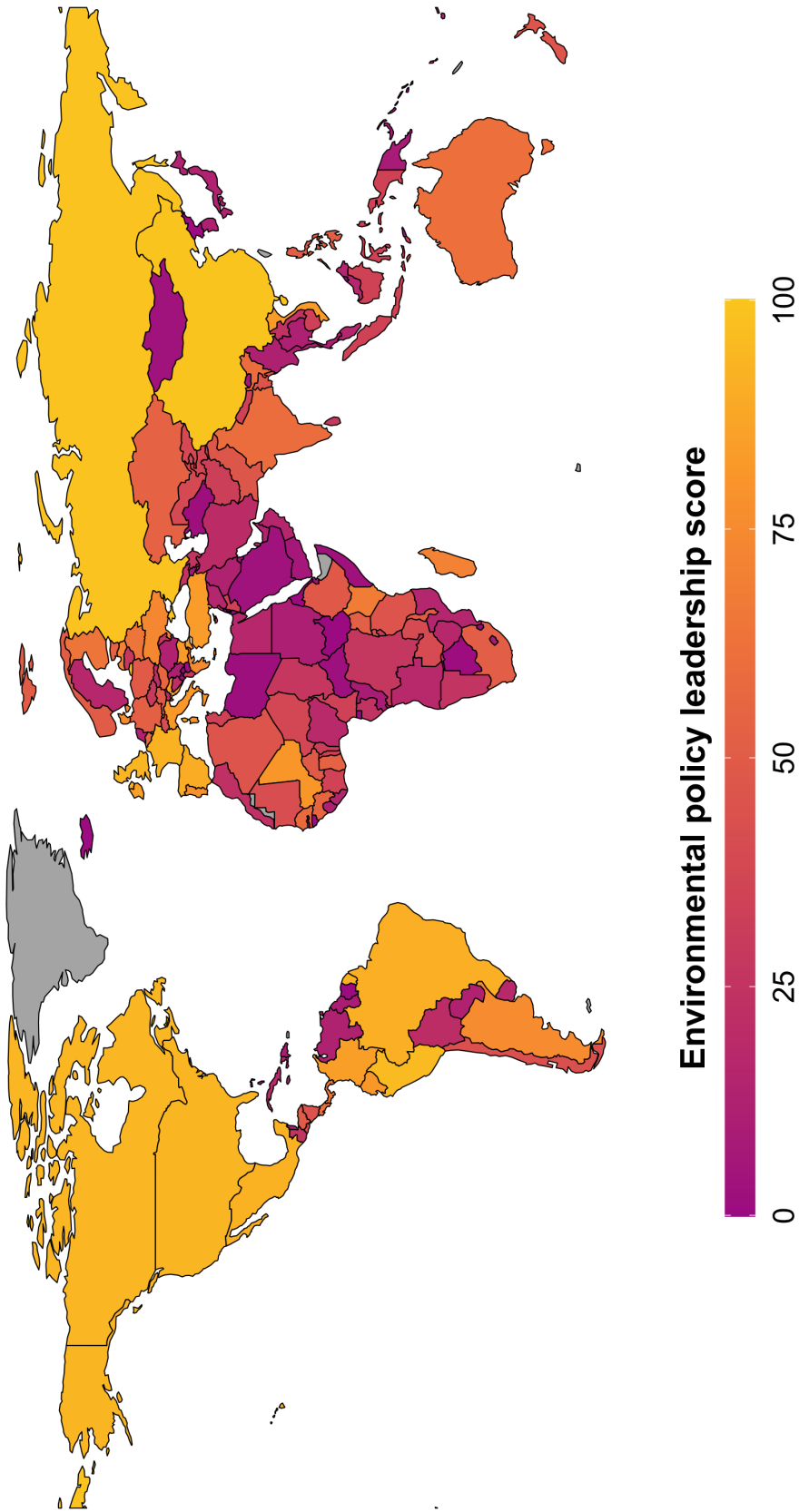


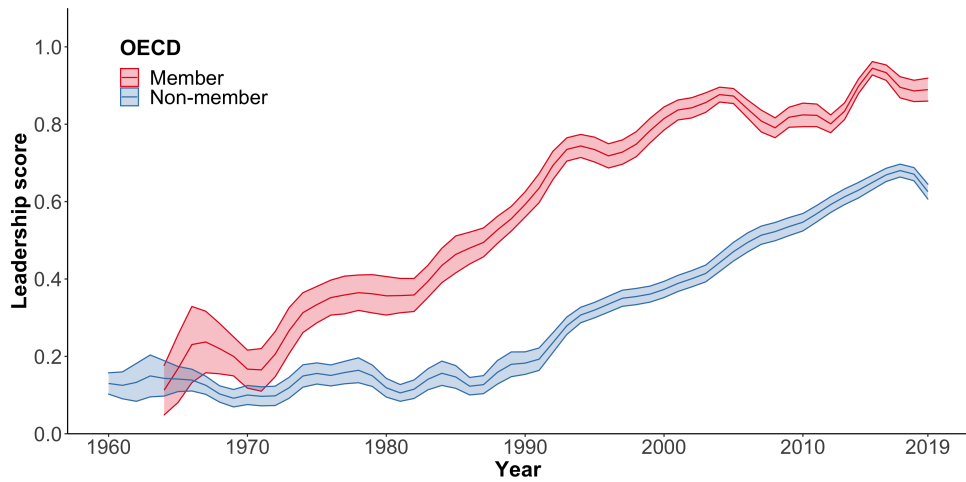
Figure 4.18: Geographic distribution of environmental policy leadership by country (2010-2019 average).

Figure 4.19 compares environmental policy leadership by wealth, democracy, and conflict. Starting with wealth, the relatively rich countries that are part of the OECD initially had slightly higher leadership scores than relatively poor non-member countries, but this gap opened slightly in the 1970s and then to a larger extent from the 1980s to mid-2000s. However, the rate of growth in environmental policy leadership for OECD member states decreased markedly in the 1990s. In contrast, non-member states of the OECD saw their environmental policy leadership, previously stagnant, start to climb in the 1990s and the size of the gap between rich and poor states in more recent years has shrunk back to its 1970s-era equivalent. In 2019, the non-member of the OECD displays as much environmental policy leadership as the average OECD member state in 1990.

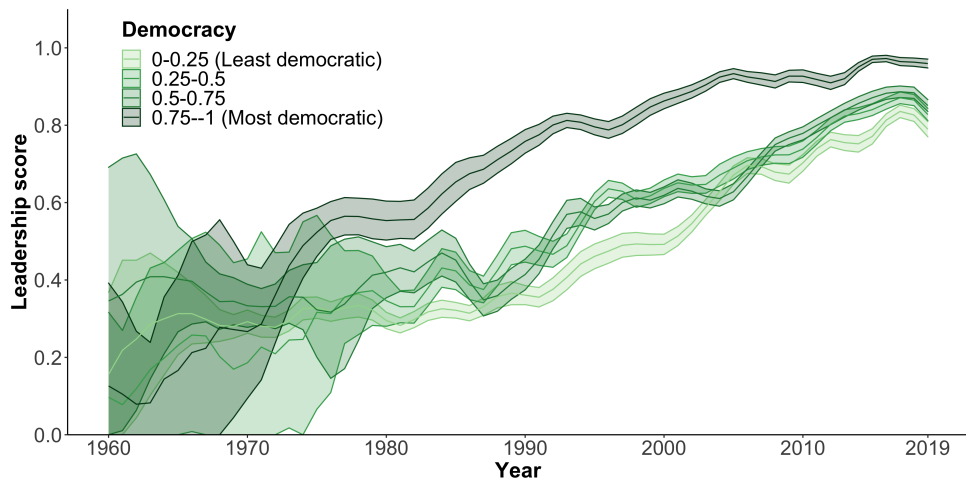
With democracy, there was initially little difference between more and less democratic states in the 1960s and 1970s (Figure 4.19b). But by the mid-1990s, the most democratic states had separated themselves from the pack and have consistently demonstrated more environmental policy leadership than other countries since then. The environmental policy leadership of less democratic countries has also grown, albeit less quickly, such that the difference in policy leadership between the most and least democratic states has become considerably less since the mid-1990s.

In terms of conflict, states at war have generally demonstrated less environmental policy leadership than states at peace over the past 60 years (Figure 4.19c). The only period when this gap closed was from the mid-1990s to the mid-2000s, a period when highly innovative and influential countries like Russia and India were engaged in major armed conflicts. As of 2019, countries at peace display approximately 50% more environmental policy leadership than countries at war.

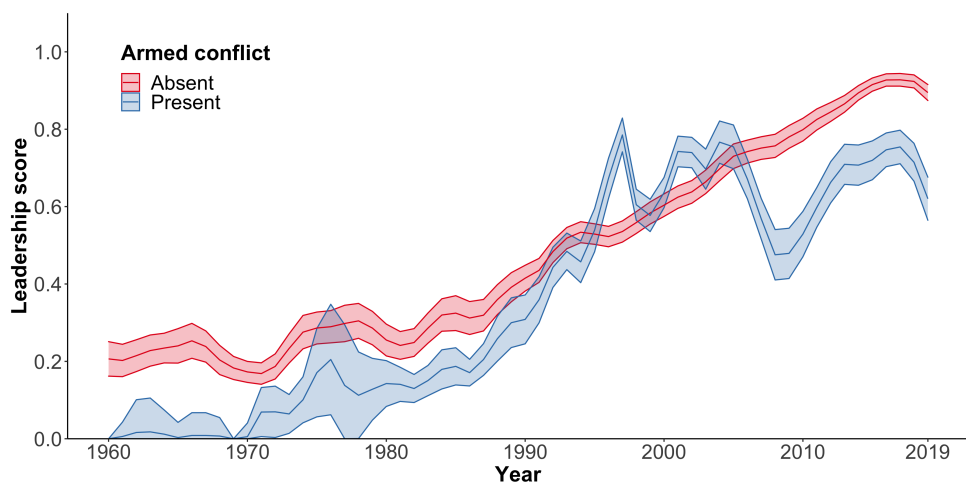
Finally, Table 4.C.3 shows the countries with the five highest environmental policy leadership scores in each decade. In recent decades, environmental policy leaders have tended to be either large (e.g., China and Russia) or wealthy (e.g., Italy, Canada, and the United Kingdom). For 2010–2019, the highest-scoring countries were China, Russia, Peru, Canada, and the United Kingdom. Perhaps surprisingly, the United States is not among the top five in any decade, although it just misses out at position six for 2010–2019.



(a) By OECD membership



(b) By electoral democracy



(c) By armed conflict

Figure 4.19: Environmental policy leadership by OECD membership, electoral democracy, and armed conflict, 1960–2019.

4.5 Conclusion

I started this chapter by describing three key characteristics for measuring environmental policy leadership: broad topical scope, wide geographic breadth, and long temporal coverage. I then presented the results of a systematic literature review in which I measured the topical, geographic, and temporal characteristics of existing data on environmental policy adoption. I found that scholars have tended to focus on pollution-centric topics like energy, air, and waste while ignoring traditional environmental issues like minerals, fisheries, and agriculture. I also discovered that very few comparative analyses of environmental policy include observations from large portions of the developing world, especially countries in Africa, the Middle East, and South and South-East Asia.

With these limitations in mind, I introduced policy extraction, a new method for identifying policy adoption events through a sophisticated keyword search of a large collection of laws and regulations. I then proceeded to apply this methodology to the FAOLEX dataset, yielding a dataset on environmental policy adoptions that is two orders of magnitude larger than the most widely used environmental policy datasets. I concluded the chapter by calculating environmental policy leadership and its constituent components of environmental policy innovation and influence. In the following chapter, I use these measures as the foundation for evaluating the extent to which the activities of transnational environmental policy advocates explain variation in environmental policy leadership.

Appendix 4.A Studies included in the systematic review

- Aklin, M. and Urpelainen, J. (2014). The global spread of environmental ministries: Domestic-international interactions. *International Studies Quarterly*, 58(4):764–780
- Alizada, K. (2018). Rethinking the diffusion of renewable energy policies: A global assessment of feed-in tariffs and renewable portfolio standards. *Energy Research & Social Science*, 44:346–361
- Baldwin, E., Carley, S., and Nicholson-Crotty, S. (2019). Why do countries emulate each others' policies? a global study of renewable energy policy diffusion. *World Development*, 120:29–45
- Biesenbender, S. and Tosun, J. (2014). Domestic politics and the diffusion of international policy innovations: How does accommodation happen? *Global Environmental Change*, 29:424–433
- Botta, E. and Koźluk, T. (2014). Measuring environmental policy stringency in oecd countries: A composite index approach. OECD Economics Department Working Papers 1177, OECD Publishing
- Busch, P. O. and Jörgens, H. (2005). The international sources of policy convergence: Explaining the spread of environmental policy innovations. *Journal of European Public Policy*, 12(5):860–884
- Busch, P.-O., Jörgens, H., and Tews, K. (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):146–167
- Carley, S., Baldwin, E., MacLean, L. M., and Brass, J. N. (2017). Global expansion of renewable energy generation: An analysis of policy instruments. *Environmental and resource economics*, 68(2):397–440
- Dubash, N. K., Hagemann, M., Höhne, N., and Upadhyaya, P. (2013). Developments in national climate change mitigation legislation and strategy. *Climate Policy*, 13(6):649–664
- Fernández-i Marín, X., Knill, C., and Steinebach, Y. (2021). Studying policy design quality in comparative perspective. *American Political Science Review*, pages 1–17
- Genovese, F., Kern, F. G., and Martin, C. (2017). Policy alteration: Rethinking diffusion processes when policies have alternatives. *International Studies Quarterly*, 61(2):236–252
- Holzinger, K., Knill, C., and Sommerer, T. (2008b). Environmental policy convergence: The impact of international harmonization, transnational communication, and regulatory competition. *International Organization*, pages 553–587
- Holzinger, K., Knill, C., and Sommerer, T. (2011). Is there convergence of national environmental policies? an analysis of policy outputs in 24 OECD countries. *Environmental Politics*, 20(1):20–41

- Jenner, S., Chan, G., Frankenberger, R., and Gabel, M. (2012). What drives states to support renewable energy? *The Energy Journal*, 33(2)
- Kammerer, M. and Namhata, C. (2018). What drives the adoption of climate change mitigation policy? A dynamic network approach to policy diffusion. *Policy Sciences*, 51(4):477–513
- Kern, K., Jörgens, H., and Jänicke, M. (2001). The diffusion of environmental policy innovations: A contribution to the globalisation of environmental policy. Technical report, Wissenschaftszentrum Berlin für Sozialforschung
- Kim, J. E. (2020). Regulation trumps economics? examining renewable energy policy, diffusion and investment in 80 developing countries. *Energy Research & Social Science*, 70:101613
- Knill, C. and Tosun, J. (2009). Hierarchy, networks, or markets: How does the eu shape environmental policy adoptions within and beyond its borders? *Journal of European Public Policy*, 16(6):873–894
- Knill, C., Heichel, S., and Arndt, D. (2012a). Really a front-runner, really a Straggler? Of environmental leaders and laggards in the European Union and beyond - A quantitative policy perspective. *Energy Policy*, 48:36–45
- Knill, C., Schulze, K., and Tosun, J. (2012b). Regulatory policy outputs and impacts: Exploring a complex relationship. *Regulation & Governance*, 6(4):427–444
- Jörgens, H. (1996). Die Institutionalisierung von Umweltpolitik im internationalen Vergleich. In Jänicke, M., editor, *Umweltpolitik der Industrieländer. Entwicklung - Bilanz - Erfolgsbedingungen*, pages 59–111. edition sigma
- Schaffer, L. M. and Bernauer, T. (2014). Explaining government choices for promoting renewable energy. *Energy Policy*, 68:15–27
- Schmidt, T. S. and Sewerin, S. (2019). Measuring the temporal dynamics of policy mixes— an empirical analysis of renewable energy policy mixes’ balance and design features in nine countries. *Research Policy*, 48(10):103557
- Stadelmann, M. and Castro, P. (2014). Climate policy innovation in the south—domestic and international determinants of renewable energy policies in developing and emerging countries. *Global Environmental Change*, 29:413–423
- Thisted, E. V. and Thisted, R. V. (2020). The diffusion of carbon taxes and emission trading schemes: The emerging norm of carbon pricing. *Environmental Politics*, 29(5):804–824
- Tosun, J. (2013). *Environmental Policy Change in Emerging Market Democracies*. University of Toronto Press
- U.S. Environmental Protection Agency (1998). Environmental labeling. issues, policies, and practices worldwide. Working Paper EPA 742-R-98-009, U.S. Environmental Protection Agency: Office of Prevention, Pesticides, and Toxic Substances

Appendix 4.B Top five most widely adopted policies in FAOLEX by topic

Table 4.B.1: Top five most widely adopted environmental policies in FAOLEX by topic

Subject	Policy	Min	Max	N(countries)
Agricultural & rural dev.	promote develop agricultural production	1963	2018	169
Agricultural & rural dev.	promote develop agricultural product	1948	2018	150
Agricultural & rural dev.	promote develop farm	1948	2019	127
Agricultural & rural dev.	promote develop rural employment	1951	2018	122
Agricultural & rural dev.	promote produce agricultural production	1962	2019	106
Air & atmosphere	standard deplete ozone	1988	2018	60
Air & atmosphere	promote develop emissions trading	2009	2014	30
Air & atmosphere	promote restore greenhouse gas emission	1993	2019	27
Air & atmosphere	standard emit limit value	1990	2018	23
Air & atmosphere	licence emit air pollution	1984	2015	22
Cultivated plants	promote develop seed	1937	2018	101
Cultivated plants	standard apply pesticide	1971	2019	92
Cultivated plants	standard import seed	1966	2018	83
Cultivated plants	ban apply pesticide	1972	2019	71
Cultivated plants	standard trade seed	1977	2019	71
Energy	promote develop energy efficiency	1985	2018	90
Energy	standard distribute electricity transmission	1924	2019	75
Energy	licence distribute electricity transmission	1981	2019	66
Energy	cooperation apply nuclear energy	1972	2016	64
Energy	promote develop renewable energy	1986	2019	61
Environment gen.	manage conserve environmental protection	1974	2018	172
Environment gen.	promote conserve environmental protection	1969	2018	167
Environment gen.	promote restore environmental protection	1974	2018	143
Environment gen.	promote develop climate change	2001	2019	141
Environment gen.	promote develop environmental protection	1974	2018	138
Fisheries	promote develop aquaculture	1981	2018	107
Fisheries	standard produce fish processing facility	1982	2019	107
Fisheries	promote produce fish processing facility	1981	2018	105
Fisheries	collect data produce fish processing facility	1996	2019	68
Fisheries	ban fishing fishing equipment	1957	2018	63
Food & nutrition	promote develop food safety	1968	2018	163
Food & nutrition	promote develop food security	1987	2018	125
Food & nutrition	promote develop food additives	1958	2019	102
Food & nutrition	standard apply food additives	1962	2019	90

Continued on next page

Table 4.B.1: Top five most widely adopted environmental policies in FAOLEX by topic

Subject	Policy	Min	Max	N(countries)
Food & nutrition	standard produce food safety	1966	2017	73
Forestry	promote develop wood product	1968	2019	68
Forestry	standard trade wood product	1929	2017	47
Forestry	promote conserve deforestation	2000	2018	46
Forestry	promote trade wood product	1973	2019	46
Forestry	manage produce wood product	1978	2017	42
Land & soil	standard graze pastoral land	1953	2019	87
Land & soil	ban graze pastoral land	1950	2018	66
Land & soil	promote graze pastoral land	1953	2019	62
Land & soil	promote develop economic development zone	1994	2018	52
Land & soil	subsidize graze pastoral land	1923	2017	52
Livestock	licence produce animal feed	1973	2019	61
Livestock	standard apply veterinary medicine	1983	2019	57
Livestock	standard import animal feed	1956	2017	57
Livestock	standard import cattle	1973	2018	57
Livestock	inspection produce animal feed	1962	2018	56
Mineral resources	standard conserve radioactive mineral	1996	2017	34
Mineral resources	standard transport radioactive mineral	1996	2019	25
Mineral resources	licence transport radioactive mineral	1994	2019	20
Mineral resources	licence package radioactive mineral	1996	2002	18
Mineral resources	licence import radioactive mineral	1967	2018	13
Sea	standard transport vessel	1960	2019	105
Sea	inspection transport vessel	1974	2019	87
Sea	licence transport vessel	1960	2019	82
Sea	manage transport vessel	1972	2019	78
Sea	registration transport vessel	1960	2019	66
Waste & hazardous subst.	promote develop sanitation service	1961	2019	84
Waste & hazardous subst.	standard transport hazardous chemical	1980	2018	72
Waste & hazardous subst.	promote develop waste management	1994	2018	70
Waste & hazardous subst.	licence emit wastewater	1973	2019	68
Waste & hazardous subst.	standard apply hazardous chemical	1983	2019	65
Water	manage conserve surface water	1973	2018	58
Water	promote develop surface water	1977	2019	58
Water	standard conserve ocean	1979	2017	54
Water	manage develop water supply	1974	2018	53
Water	manage conserve ocean	1987	2018	51
Wild species & ecosystems	promote develop conservation research	1947	2019	136
Wild species & ecosystems	standard conserve wildlife	1935	2019	133
Wild species & ecosystems	promote conserve biodiversity	1972	2019	127

Continued on next page

Table 4.B.1: Top five most widely adopted environmental policies in FAOLEX by topic

Subject	Policy	Min	Max	N(countries)
Wild species & ecosystems	promote conserve wildlife	1964	2018	117
Wild species & ecosystems	manage conserve wildlife	1964	2018	116

Appendix 4.C Additional tables and figures

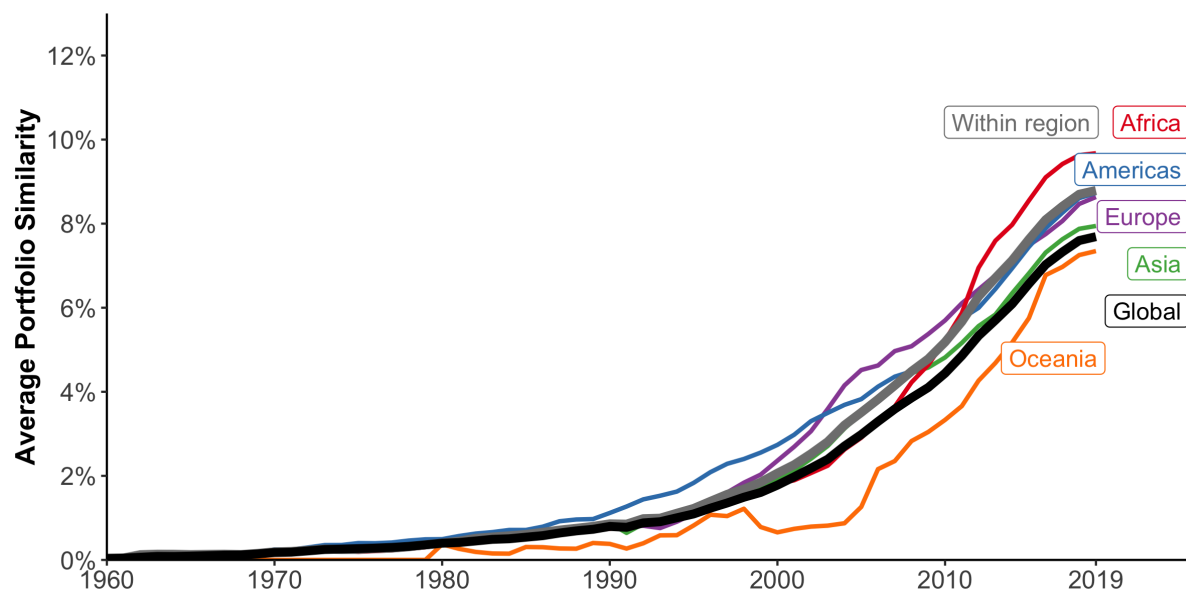


Figure 4.C.1: Global, within-region, and regional environmental policy portfolio similarity, 1960–2019 (domestic policies only).

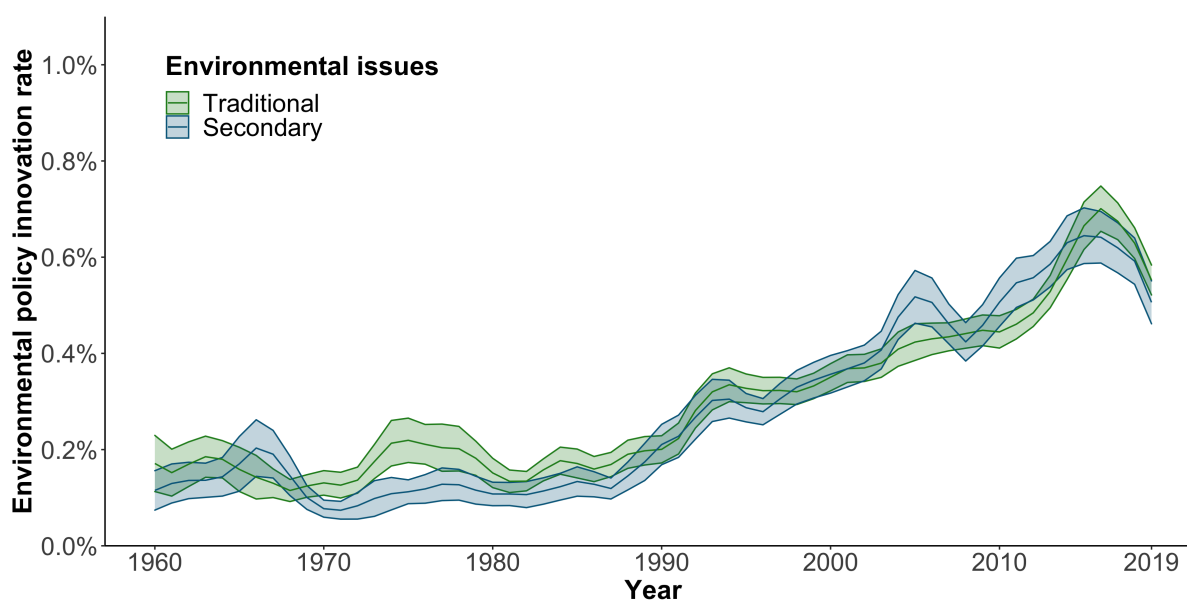


Figure 4.C.2: Environmental policy innovation rate for all countries combined by traditional and secondary environmental issues, 1960–2019.

Values are smoothed using a 3-year rolling average for presentation purposes.

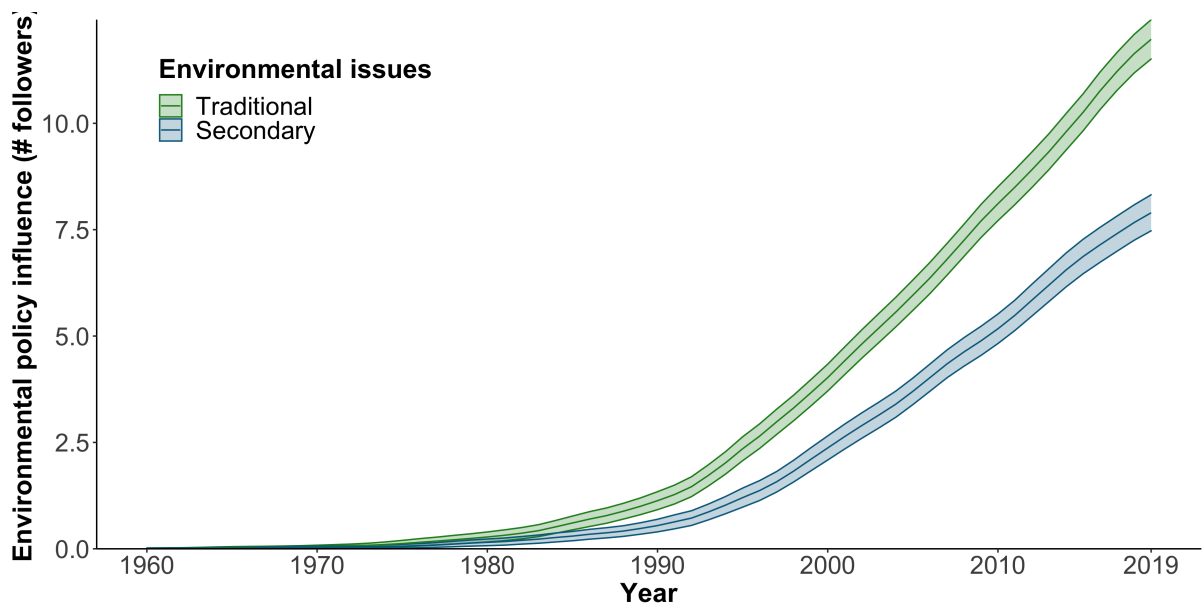


Figure 4.C.3: Environmental policy influence score for all countries combined by traditional and secondary environmental issues, 1960–2019.

Values are smoothed using a 3-year rolling average for presentation purposes.

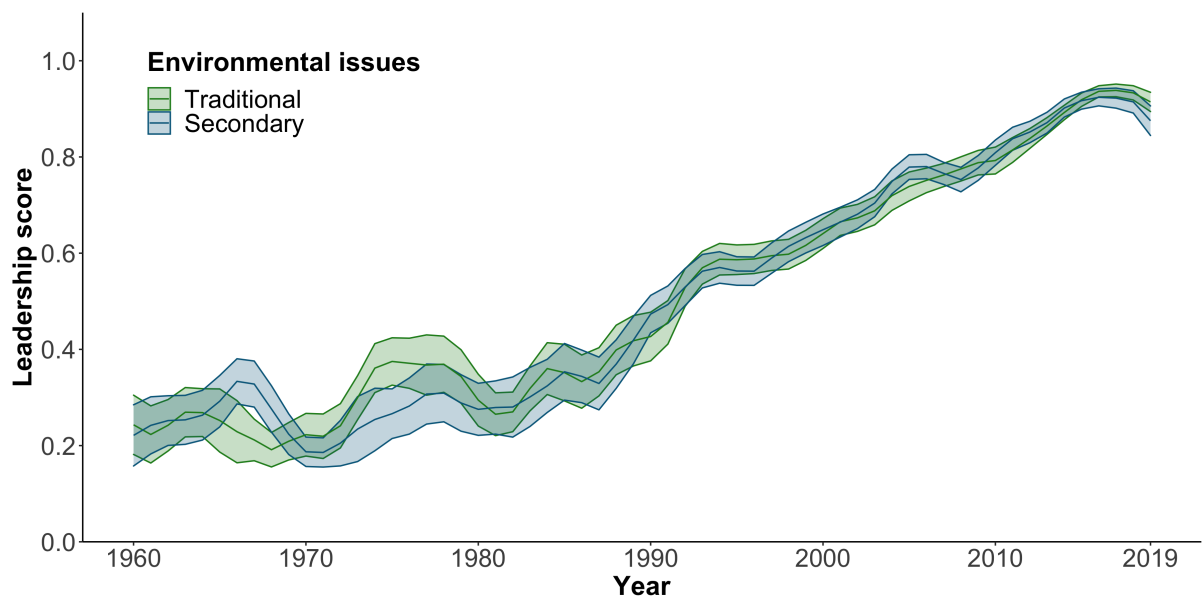


Figure 4.C.4: Environmental policy leadership for all countries combined by traditional and secondary environmental issues, 1960–2019.

Values are smoothed using a 3-year rolling average for presentation purposes.

Table 4.C.1: Top five highest environmental innovation rates by decade

	1960–1969	1970–1979	1980–1989
1	Kenya (3.2%)	Papua New Guinea (1.1%)	Italy (1.5%)
2	Eswatini (2.1%)	Bangladesh (1.0%)	Greece (1.0%)
3	Lesotho (1.4%)	Italy (1.0%)	Spain (0.9%)
4	Tanzania (1.0%)	United Kingdom (0.7%)	Ireland (0.9%)
5	Mauritius (1.0%)	Ireland (0.7%)	United Kingdom (0.8%)
	1990–1999	2000–2009	2010–2019
1	Russia (4.3%)	Russia (2.1%)	China (2.1%)
2	Italy (2.1%)	United Kingdom (2.0%)	United States (2.0%)
3	Spain (1.9%)	China (1.8%)	Russia (1.8%)
4	United Kingdom (1.8%)	France (1.8%)	Peru (1.8%)
5	Portugal (1.8%)	Latvia (1.5%)	Ecuador (1.7%)

Table 4.C.2: Top five highest environmental influence scores by decade

	1960–1969	1970–1979	1980–1989
1	Sudan (1.8)	Mali (11.7)	Italy (17.2)
2	Egypt (1.7)	Panama (9.0)	Panama (8.4)
3	Madagascar (1.7)	Qatar (8.5)	Pakistan (8.1)
4	Israel (1.6)	Senegal (7.8)	Morocco (7.8)
5	Pakistan (1.6)	Morocco (4.2)	Greece (7.5)
	1990–1999	2000–2009	2010–2019
1	Italy (50.2)	Russia (140.7)	Russia (180.8)
2	Russia (38.0)	Italy (95.5)	China (130.3)
3	Greece (33.8)	Spain (71.6)	Italy (104.9)
4	Spain (29.0)	United Kingdom (66.6)	United Kingdom (96.1)
5	United Kingdom (26.3)	China (57.8)	Spain (85.7)

Table 4.C.3: Top five highest environmental policy leadership scores by decade

	1960–1969	1970–1979	1980–1989
1	Kenya (96.9)	Italy (92.9)	Italy (100.0)
2	France (90.9)	Pakistan (92.9)	Greece (98.1)
3	Pakistan (89.2)	France (91.7)	United Kingdom (91.9)
4	Madagascar (86.5)	United Kingdom (91.0)	Spain (91.2)
5	India (84.3)	Israel (88.9)	France (90.7)
	1990–1999	2000–2009	2010–2019
1	Italy (99.5)	Russia (100.0)	China (99.5)
2	Russia (99.5)	United Kingdom (97.9)	Russia (99.0)
3	Spain (97.4)	China (96.9)	Peru (95.4)
4	United Kingdom (96.3)	Italy (95.4)	Canada (93.9)
5	Greece (94.8)	Spain (94.3)	United Kingdom (93.4)

Appendix 4.D Procedure for determining optimal window size for dynamic network inference

I estimate the primary network of interest by pooling across all topics, although I also estimate separate influence networks for each topic. To measure these networks over time, I use a 40-year sliding window. The length of the window was determined, as per [Desmarais et al. \(2015\)](#), by comparing the Bayesian Information Criterion statistics for pooled discrete-time event-history models that estimate policy adoption as a function of the cumulative number of states to have already adopted the policy, the number of a state’s leaders in the network to have adopted a policy previously, and a policy-specific intercept. The two other parameters in the NetInf algorithm, the total number of edges in the network and a rate parameter for penalizing the time gap between policy adoptions, were determined automatically via an iterative Vuong-style test check for whether each edge significantly improved the network fit and as the midpoint between the inverse averages of the minimum and maximum diffusion times across all cascades, respectively ([Linder and Desmarais 2017](#)).

Chapter 5

Evaluating Transnational Advocacy's Effect on Environmental Policy Leadership

In this chapter, I assess the extent to which transnational environmental advocates catalyze environmental policy leadership. I begin by evaluating the overall relationship between environmental policy leadership and the activities of large international environmental NGOs, environmental programming by IDOs, and lobbying on environmental issues by multinational corporations over the past two decades. Next, I break up policy leadership into its constituent dimensions of innovation and influence to understand whether different types of transnational advocates have a stronger relationship with one component than another. I then consider the conditions under which transnational advocates tend to be more successful in spurring environmental policy leadership, as well as the efficacy of different strategies of advocacy and the potential for synergies among various types of transnational advocates. Finally, I examine whether the relationship between transnational environmental advocacy and policy leadership varies by issue and policy complexity.

5.1 Transnational advocacy and environmental policy leadership

As discussed in Chapter 2, leaders in environmental policy development are both innovative, quick to adopt new environmental policies, and influential, inspiring policymakers in other countries to adopt similar policies. In other words, environmental policy leaders both “walk the walk” and “talk the talk” in environmental policy. In Chapter 3, I focused on transnational advocates who inform, support, and pressure policymakers to spend their time and resources working on environmental issues. Transnational advocates play a dual role in environmental policymaking, contributing to transnational communication by conveying information about the actions of other policymakers while simultaneously encouraging policymakers to adopt favored policies. Accordingly, I anticipate that countries display higher levels of environmental policy leadership when transnational environmental advocates are more active (**H1a**) and when these states are connected through transnational advocates with other states that display high levels of environmental policy leadership (**H1b**). In Chapter 4, I introduced a novel measure of environmental policy leadership constructed from the combination of a country’s rate of environmental policy innovation and its number of followers. In this section, I assess the extent to which variation in environmental policy leadership is explained by the activities of transnational advocates.

To account for the dual role of transnational advocates as both proponents of environmental policy (a direct effect) and as agents of transnational communication, I use a temporal network autocorrelation model (TNAM). Like other spatial models, a TNAM allows the researcher to specify a connectivity matrix composed of elements set to a value greater than 0 if there is a dependency between a given pair of units (Plümper and Neumayer 2010). These dependencies reflect communication channels between countries that form due to the transnational coordination of environmental policy advocacy. TNAM is a spatial autoregressive model, meaning that the outcome is affected by outcomes in connected units, with stronger dependencies (i.e., more communication) producing

stronger effects. The temporal aspect of the TNAM allows both the connectivity matrix and variables of interest to vary over time and include time lags (Franzese Jr and Hays 2007).

The TNAM in this analysis takes the following form:

$$y_{it} \sim \beta_{it}X + \rho_1 E y_{it} + \rho_2 D y_{it} + \rho_3 M y_{it} + \gamma Z y_{it} + \epsilon_{it}$$

The dependent variable, y_{it} , is the leadership score ($Leadership_{i,t}$) for country i in year t . The term X is a vector containing country-level covariates, including three explanatory variables of interest: 1) $NGOs_{i,t}$, the number of large international environmental NGOs present in a country i in year t , 2) $IDOS_{i,t}$, the amount of environmental ODA per capita spent or received by all IDOs reporting to the OECD DAC in a country i in a year t , and 3) $MNCs_{i,t}$, the estimated amount spent (as a percentage of GDP) on environmental lobbying by all multinational corporations in a country i in a year t . These variables capture the catalytic effect of transnational advocates on environmental policy innovation. X also contains a set of control variables accounting for policymakers' access to information, resources and capacity, and political will, discussed in detail below. E , D , and M are time-varying connectivity matrices representing, respectively, the number of large international environmental NGOs, environmental ODA funding by IDOs, and the number of environment-lobbying MNCs each pair of countries share at time t . Z represents connectivity matrices for other control variables, described below. By multiplying these matrices by the policy leadership of other countries, these network autocorrelation terms capture how transnational advocates amplify the influence of the countries with which they work.¹

5.1.1 Control variables

Since this analysis relies on an observational research design, it is important to account for other factors that might affect the relationship between transnational environmental

¹This model specification shares elements in common with Kammerer and Namhata (2018), who examine how intergovernmental climate cooperation inspires climate policy change.

advocacy and environmental policy leadership. These variables can be grouped into three sets of covariates representing factors affecting policymakers' access to information, resources and capacity, and political will to engage in environmental policy innovation. Table 5.1 lists these variables and their data sources.

Table 5.1: Control variables

Type	Variable	Source
<i>Information</i>		
	Domestic environmental NGOs	Longhofer et al. (2016)
	CSO consultation index	Coppedge et al. (2021)
	KOF globalization index	Gygli et al. (2019)
<i>Resources/capacity</i>		
	GDP per capita PPP	World Bank (2021b)
	Environmental ministry	Aklin and Urpelainen (2014)
	Number of veto points	Cruz et al. (2021)
<i>Political will</i>		
<i>Institutions</i>		
	Polyarchy index	Coppedge et al. (2021)
	Federalism	Henisz (2017)
	EU membership	Head et al. (2014)
	OECD membership	Author
<i>Parties</i>		
	Left-wing control of executive	Cruz et al. (2021)
	Green party	Author
<i>Issue salience</i>		
	Greenhouse gas emissions	Climate Watch (2021)
	Natural resource rents (% GDP)	World Bank (2021c)
	Agricultural land (% land area)	World Bank (2021a)
	Major armed conflict	Pettersson and Öberg (2020)
<i>Peers</i>		
	Colonial relationship	Head et al. (2014)
	Common language	Head et al. (2014)
	Contiguity	Head et al. (2014)
	Regional Trade Agreement	Head et al. (2014)
	Trade flows	Head et al. (2014)
<i>History</i>		
	Leadership (lag)	Author

The first set, access to information, centers on the ability of policymakers to learn about environmental problems and potential policy solutions through other channels. Information is a precondition to adopting any policy because policymakers need to appreciate the relevance and appropriateness of the policy options at hand (Dolowitz and Marsh 2000). Domestic civil society organizations can play an important role in keeping

policymakers informed about environmental issues (Steinberg et al. 2001; Kim and Cha 2004). I measure the strength of domestic civil society in terms of the logged number of *domestic environmental NGOs* (Longhofer et al. 2016) and the opportunities these organizations have to influence policymaking via the V-DEM *civil society organization consultation* index (Bernhard et al. 2015; Coppedge et al. 2021). Integration into global economic, political, and cultural activities, as measured via the KOF *globalization* index (Gygli et al. 2019), is also important for policymakers to stay about new policies and to inform others about their own changes in environmental policy. I expect increases in all these factors to be positively related to environmental policy leadership.

The second set of covariates, resources and capacity, speaks to the economic and human resources that policymakers have at their disposal for environmental policymaking because policymakers should be more likely to adopt policies when they believe successful implementation is feasible.² A generic measure of these resources is logged *Gross Domestic Product (GDP) per capita* purchasing power parity, 2021 international dollars, World Bank (2021b)). The existence of an *environmental ministry* provides a more specific measure of the resources available for working on environmental issues and building international environmental influence (Aklin and Urpelainen 2014; Aamodt 2018). Another component of capacity is the feasibility of successfully enacting changes in environmental policy, which is affected by the number of *veto points* in the policymaking process (Madden 2014; Cruz et al. 2021). I anticipate that countries that are wealthier and that have environmental ministries will tend to demonstrate more environmental policy leadership, while countries with more veto points will tend to find it more challenging to act as environmental policy leaders.

Once policymakers have sufficient information and capacity, the third and final obstacle to the exercise of environmental policy leadership is political will. Policymakers need to be motivated to devote their limited time and political capital to environmental issues. I identify four subsets of factors affecting political will: institutions, parties,

²It may also happen that governments adopt infeasible, but popular policies as signaling devices (Simmons et al. 2006; Liefferink et al. 2016). To the extent this signaling occurs, it should weaken the relationship between implementation capacity and leadership.

issue salience, and peers. Starting with institutions, the existence of *electoral democracy*, measured via V-DEM's polyarchy index (Teorell et al. 2019; Coppedge et al. 2021), is thought to foster political attention to environmental problems (Neumayer 2002; Bättig and Bernauer 2009). Since this analysis focuses on national-level policy, *federalism* should affect policy leadership because national governments in unitary political systems have more policymaking responsibility than national governments in federal systems (Henisz 2017).³ Countries that are *members of the European Union* and/or *members of the OECD* may also tend to demonstrate more environmental policy leadership through their implementation of group-level environmental initiatives.

Turning to parties, *governments led by left-wing political parties* may be more responsive to social ills like pollution and resource degradation (Neumayer 2003). The existence of a national-level *Green party* may also help push environmental issues higher up the political agenda (Knill et al. 2010). I collected original data on Green party creation and destruction through internet searches based on lists of Green parties maintained by Global Greens⁴ and the World Ecological Parties organizations.⁵

For the third subset, resources, policymakers may also devote more effort to environmental issues when such issues are more important, which can be thought of in terms of both problem pressure, measured as log *greenhouse gas emissions* (Climate Watch 2021), and issue salience, using measures like *natural resource rents* as a proportion of GDP (World Bank 2021c) and *agricultural land* as a proportion of land area (World Bank 2021c). The salience of environmental issues also depends on the other topics competing for policymakers' attention. For example, policymakers may pass less attention to environmental issues when their country is the site of major *armed conflict*, measured as more than 1000 battle deaths (Gleditsch et al. 2002; Pettersson and Öberg 2020).

Finally, policymakers' political will to act as leaders on environmental policy may also be a function of the environmental policy leadership of their peers in other states.

³Conversely, Schaffer and Bernauer (2014) observe that federalism is positively associated with the adoption of renewable energy policies, a finding they explain with reference to the opportunities for policy experimentation at the sub-national level.

⁴<https://GlobalGreens.org> (accessed June 2, 2021).

⁵<https://www.w-e-p.org> (accessed June 2, 2021).

Policymakers may consider their counterparts in other jurisdictions to be peers based on a variety of cultural, political, and economic linkages, including *colonial relationships*, Hicks et al. (2010), *common language* (Holzinger et al. 2008b), geographical *contiguity* (Simmons and Elkins 2004), *regional trade agreements*,⁶ and *trade flows* (Schaffer and Bernauer 2014). I measure regional trade agreements, colonial ties, contiguity, trade (BACI) using the CEPII Gravity database (Head et al. 2014).

In addition to covariates on information, resources, and political will, I account for the autoregressive nature of environmental policy leadership using lags of environmental policy leadership. I control for unobserved country-level heterogeneity via country fixed effects and unobserved year-level heterogeneity via year fixed effects. These steps account for potentially relevant time-invariant country characteristics, such as biodiversity, and events of global significance for environmental policy, such as the Paris Climate Agreement. Table 5.A.1 provides summary statistics for the variables used in the primary analyses. All covariates are centered and scaled for ease of interpretation.

5.1.2 Is advocacy endogenous to leadership?

Before presenting the results of this analysis, I pause to reflect on the threat posed by endogeneity in this circumstance. Policy advocacy is a strategic behavior and, since exogenous shocks that affect only advocacy and not policymaking are exceedingly difficult to find, I am obliged to use an observational approach. As a result, there is a risk of endogeneity—that is, that transnational advocates choose to work in places where governments are already innovative and influential and so are epiphenomenal to policy leadership rather than acting as agents of change.

While endogeneity is indeed a risk, there are theoretical reasons to believe these concerns are not as serious as they appear at first glance. As discussed in Chapter 3, the missions of environmental NGOs, as well as IDOs, should lead them to focus their

⁶Most work on the effect of regional trade agreements focuses specifically on the European Union. These studies include, among many others, H eritier and Knill (2001), Mattli and Pl umper (2004), Lieferink and Jordan (2005), Oberth ur and Roche Kelly (2008), Knill and Tosun (2009), Jordan et al. (2010), Knill et al. (2012a), Wurzel and Connelly (2011), Wurzel et al. (2017), and J anicke and Wurzel (2019).

efforts on jurisdictions in which their efforts are most needed. For example, [Murdie and Urpelainen \(2015\)](#) finds that environmental NGOs are more likely to work in places where governments are repressive and lack the institutional infrastructure for environmental governance. Similarly, [Hicks et al. \(2010\)](#) observes that trade and colonial ties are among the most important influences on where bilateral IDOs work, far outweighing problem-specific considerations. Multinational corporations primarily decide to work in countries according to market size and access to resources ([De Backer and Miroudot 2018](#)), as well as the perceived risk of the state expropriating their investments ([Choi et al. 2015](#)). After accounting for the economic, political, and geographic factors that attract advocates, any remaining risk of endogeneity would tend to be in the direction of working in more difficult policy settings.

I also take statistical measures to mitigate concerns of endogeneity. To account for the potential that transnational advocates anticipate when a country will enact policies and increase its leadership, I include lagged measures of the dependent variable. Certain countries may also attract transnational advocates according to their governments' idiosyncratic and longstanding reputations for environmental policy leadership, a possibility that I account for by including country-level fixed effects.

5.1.3 Estimation procedure

I prepare the data for analysis by calculating network autocorrelation variables using the `tnam` package in R ([Leifeld et al. 2017](#)), taking the mean environmental policy leadership of each country's sources to reflect the average alter effect. I impute missing data using the R package `Amelia` ([Honaker et al. 2011](#)). I estimate the TNAM as a dynamic panel model for the years 2002–2019. Dynamic panel models contain one or more lags of the dependent variable on the right side of the model ([Arellano 2003](#)). Such lags are appropriate because policy leadership is likely to be autoregressive, meaning a country's policy leadership in one period will directly affect subsequent values of policy leadership (e.g., by building a reputation among its followers). I use the Breusch-Pagan test, Durbin-Watson test, and Wooldridge's test for serial correlation in fixed effect panels to determine the optimal

number of lags (see [Wooldridge 2010](#)).

Panel data in observational research designs tend to exhibit idiosyncratic variation by its unit of observation (country) and time (year). To account for these idiosyncratic sources of variation, I include country and year fixed effects. I adjust the conventional OLS estimates according to the White method using a heteroskedasticity and serial (cross-sectional) correlation-robust error matrix ([Arellano et al. 1987](#)). I center and scale all continuous covariates for interpretability.

When country fixed effects are used in dynamic panel models, their demeaning operation produces Nickell bias by inducing correlation between the centered lagged dependent variable and the centered error term and forcing parameter estimates toward zero ([Nickell 1981](#)). Nickell bias is of the order $\frac{1}{T}$, where T is the number of time periods, meaning this bias should be relatively small for a panel of moderate length ([Beck and Katz 2011](#)). Since my data comprise a total of 20 years (before lags), the bias should be relatively small. Accordingly, I report unadjusted OLS estimates as my main results, which are robust to alternative specifications that account for Nickell bias.⁷

5.1.4 Leadership analysis results

Figure 5.1 displays coefficient estimates and 90% and 95% confidence intervals for the relationship between transnational advocacy and environmental policy leadership.⁸ For dynamic panel models, regression estimates can be calculated both in terms of short-run effects, an immediate change in a variable, and long-run effects, the cumulative sum of effects assuming a stationary process with effects asymptotically declining to zero over time ([Wooldridge 2015](#); [Pickup 2014](#)).⁹ I center and scale the dependent variable,

⁷Specifically, I address Nickell bias by applying the orthogonal reparameterization approach implemented in the `OrthoPanels` package in R ([Pickup et al. 2017](#)). The orthogonal reparameterization approach separates the likelihood functions for the fixed effects from other parameters such that the former are informationally orthogonal to the latter and no longer lead to correlated regressors and error terms ([Pickup and Hopkins 2020](#)). Through the orthogonal reparameterization approach, I can generate unbiased and consistent estimates of the parameters of interest using a dynamic panel model with fixed effects over a short duration as $N \rightarrow \infty$ ([Lancaster 2002](#)). The results of these orthogonal panel models are labeled “OPM (bias-adjusted)” in the tables at the end of this chapter.

⁸The full results for environmental policy leadership are presented in tabular form in Table 5.B.1.

⁹Long-run effects can be calculated as $\beta/(1 - \sum_{i \in I} \rho_i)$, where ρ_i is the autoregressive parameter of lag i (see [Chudik et al. \(2018\)](#), eq. 9).

environmental policy leadership, for ease of interpretation.

The results demonstrated strong support for the effect of large international environmental NGOs on environmental policy leadership. For every one-standard-deviation increase in the number of international NGOs present in a country (approximately 2.5 NGOs), environmental policy leadership increases in the short run by 7.22 ($SE = 2.27$, $p < 0.01$) percent of a standard deviation and in the long run by 14.09 ($SE = 4.44$, $p < 0.01$) percent of a standard deviation. However, the network autocorrelation (NAC) term for international environmental NGOs fails to obtain conventional levels of statistical significance.

In contrast to international environmental NGOs, the activities of other transnational advocates do not appear to be systematically related to environmental policy leadership.¹⁰ Neither of the estimates for environmental spending by international development organizations and lobbying expenditures on environmental issues by multinational corporations attain statistical significance, nor do the estimates for their NAC terms. Among the covariates, environmental policy leadership is positively and statistically significantly related to the log number of domestic environmental NGOs, membership in the European Union, rents from natural resource extraction, the existence of a green party (at the 90% confidence level), as are the first and second lagged environmental policy leadership scores. Contrary to expectations, environmental policy leadership in countries with a shared language has a negative relationship with environmental policy leadership, albeit only at the 90% confidence level.

These results provide support for the proposition that states display higher levels of environmental policy leadership when transnational environmental advocates are more active (**H1a**), at least for the activities of international environmental NGOs. However, the results do not support **H1b**, the expectation that states would display higher levels of environmental policy leadership when states with transnational environmental advocates in common display higher levels of environmental policy leadership. This result suggests that international environmental NGOs affect environmental policy leadership primarily

¹⁰This result is robust to specifying the NAC terms with zero, one, or two years of lag between the environmental policy leadership in source and recipient state (results not shown).

due to their advocacy efforts, rather than due to their role as go-betweens linking policymakers in different jurisdictions.

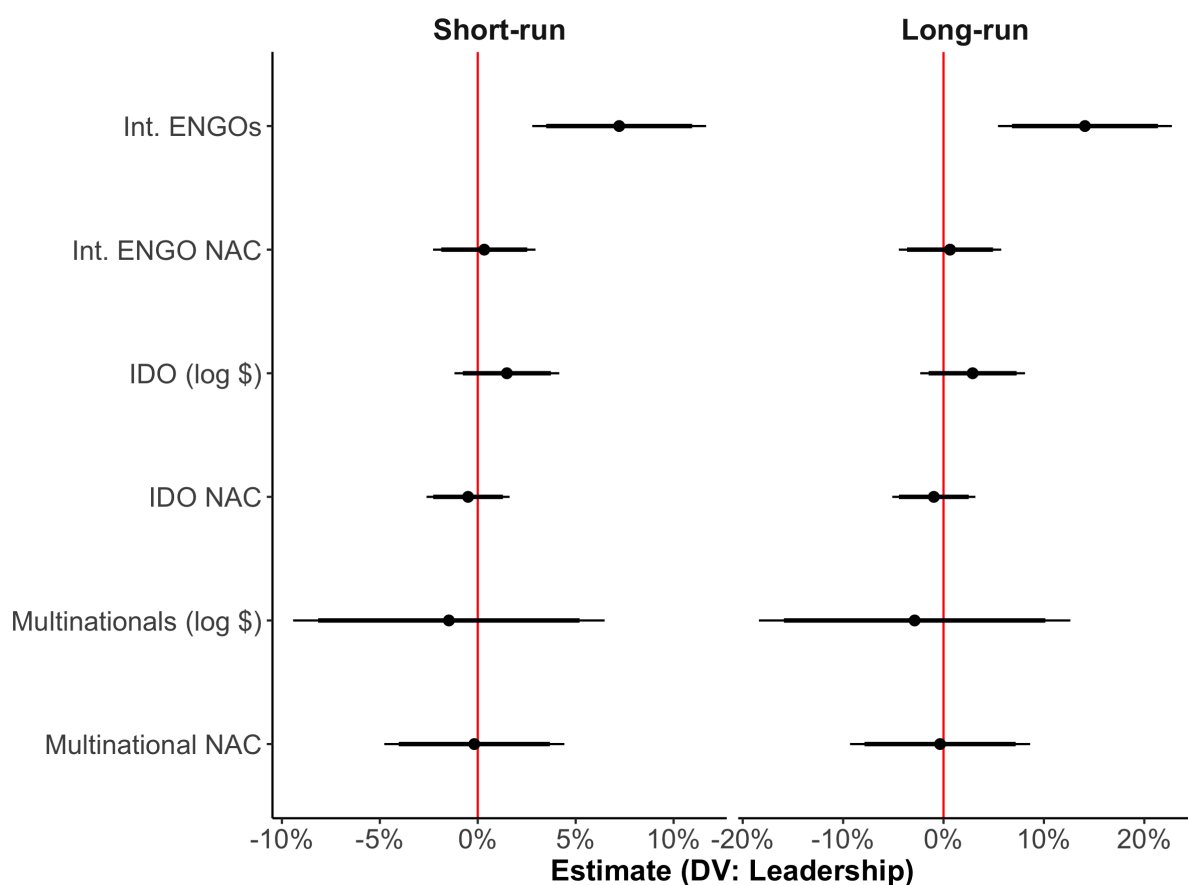


Figure 5.1: Short-run and long-run model estimates for transnational advocacy by large international environmental NGOs, international development organizations, and multinational corporations (DV: Environmental policy leadership).

Heteroskedasticity and serial correlation-robust confidence intervals (90% and 95% levels) for direct and network autocorrelation (NAC) terms.

Given the observational design of this analysis, causal interpretations of these results rely on the assumption of no unobserved confounding. To understand the robustness of these results to violations of this assumption, I calculated the impact that one or a combination of omitted variables would need to have to cause the relationship between international environmental NGOs and environmental policy leadership to lose statistical significance at the 95% confidence level. For this task, I used the sensitivity analysis tools developed by [Cinelli and Hazlett \(2020\)](#) and implemented in R in the `sensemkr` package ([Cinelli et al. 2020](#)). Figure 5.2 shows that the positive direction of the effect is robust to confounding as much as thirteen times stronger than one of the strongest observed

covariates, EU membership. The plot demonstrates that the effect for international environmental NGOs on environmental policy leadership would still be statistically significant at the 5% confidence level in the presence of confounders even thirteen times as influential as EU membership. In light of what is known about the determinants of environmental policy change, such an important unobserved confounder is unlikely to exist.

I conducted an array of additional analyses to assess the robustness of these results to alternative model specifications. As shown in Table 5.B.2, the orthogonal panel models with Nickell bias-adjusted estimates are consistent with the unadjusted OLS estimates. The main conclusions about the relationships between transnational advocates and environmental policy leadership also hold when three, four, or even five additional lags are included in the model. Further, as shown in Table 5.B.3, the results are robust when I replace the environmental policy leadership score with its year-on-year difference, when I allow for non-linearities in the relationships between transnational advocates and environmental policy leadership, and when I use a broader definition of environmental lobbying by multinational corporations.¹¹ Table 5.B.4 shows that the results are also robust to replacing the measure of IDO activity with the log count of projects per capita or with the log count of IDO organizations per capita and to replacing the measure of MNC activity with the log count of MNC firms present in each country-year. The primary variables of interest retain their sign and statistical significance (or lack thereof) across all specifications.

5.1.5 Summary

Overall, the results indicate that large international environmental NGOs play a substantively large, statistically robust role in catalyzing increases in environmental policy leadership. In particular, these organizations primarily affect environmental policy leadership through direct advocacy, rather than simply serving as a means

¹¹For example, this broader measure attributes lobbying on economic development to the Agricultural & rural development topic, even if a lot of economic development policies are not specifically intended for rural areas.

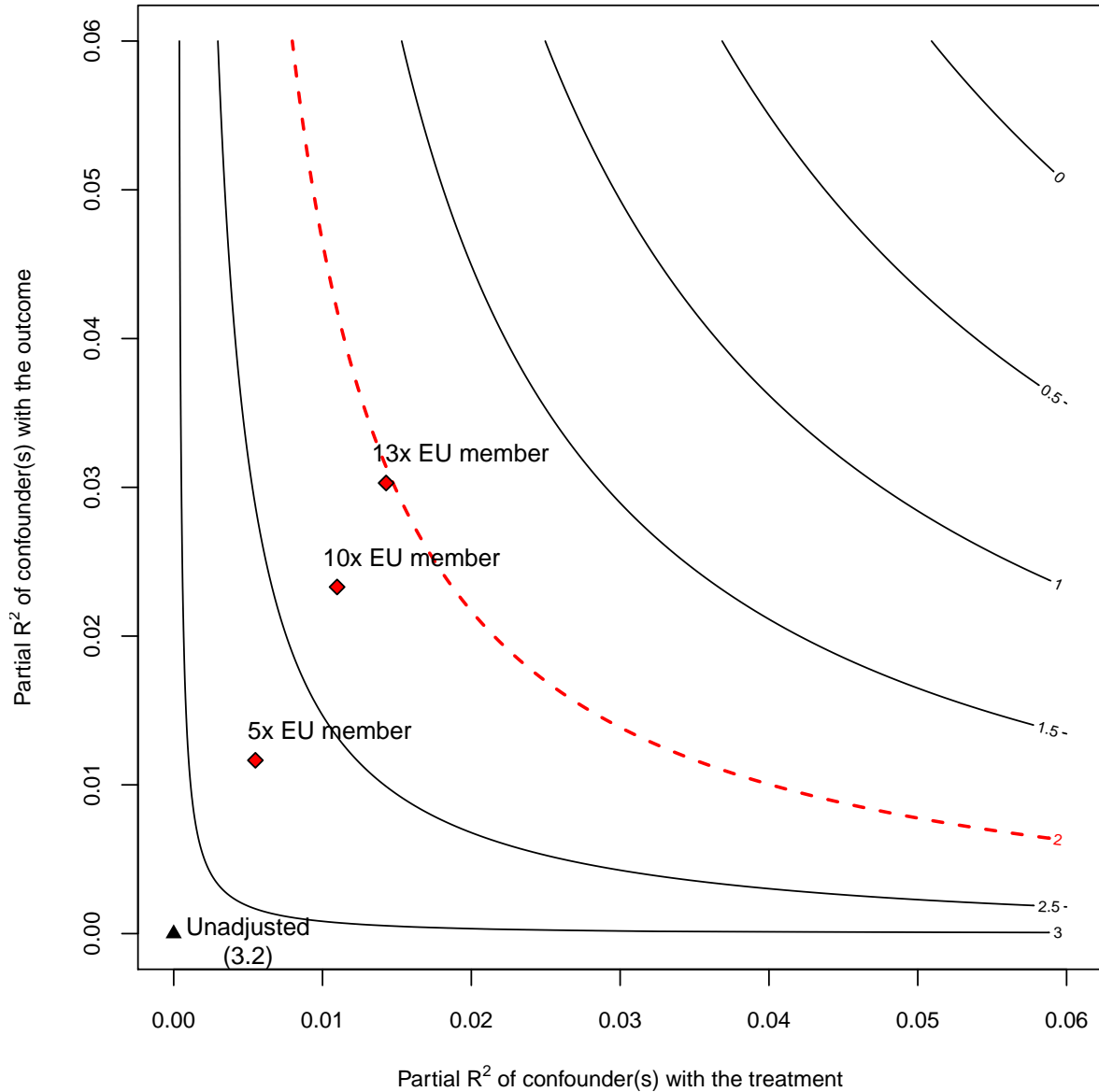


Figure 5.2: Sensitivity of relationship between international environmental NGOs and environmental policy leadership to unobserved confounders.

The unadjusted estimate is the black triangle and the red diamonds represent the estimate in the presence of an unobserved confounder that explains five, ten, and thirteen times as much variance in the treatment (international environmental NGOs) and outcome (environmental policy leadership) as EU membership. The contour lines represent t-values.

of communicating information about policy changes enacted in other countries. In contrast, environmental spending by IDOs and environmental lobbying by multinational corporations do not appear to have, on average, a systematic effect on environmental policy leadership.

5.2 Transnational advocacy and environmental policy innovation and influence

Looking beyond the overall relationship between transnational advocacy and environmental policy leadership, I consider whether transnational advocates have a stronger or weaker relationship with the constituent components of environmental policy leadership, innovation and influence. As described in Chapter 3, I expect that states have a higher rate of environmental policy innovation when more international environmental NGOs are present (**H2a**) and when they are the recipient of more environmental ODA funding by IDOs (**H2b**) and more environmental lobbying from multinational corporations (**H2c**). Similarly, I anticipate that a country is more likely to serve as a policy leader to another when the two states share more international environmental NGOs in common (**H3a**), the leader country sends more environmental ODA to the follower via an IDO (**H3b**), and the two states share more multinational corporations in common (**H3c**). In the remainder of this section, I present results for the analyses of environmental policy innovation and influence in turn.

5.2.1 Innovation

Starting with innovation, I run a dynamic panel model with the same specification as for environmental policy leadership, but I replace the dependent variable with each country-year's environmental policy innovation rate. As described in Chapter 3, the environmental policy innovation rate is calculated as the proportion of environmental policies adopted out of the set of policies that were available but had not already been adopted by each government in each year. I center and scale the innovation rate for ease of interpretation.

Figure 5.3 displays coefficient estimates and 90% and 95% confidence intervals for the relationship between transnational advocacy and environmental policy leadership.¹²

Like the results for environmental policy leadership, a one-standard-deviation increase in the number of international environmental NGOs in a country leads to an increase of 6.63 ($SE = 3.31$, $p < 0.05$) percent of a standard deviation in environmental policy innovation in the short-run and a 12.80 ($SE = 6.38$, $p < 0.05$) percent increase in the long-run. Environmental spending by international development organizations also appears to have a positive effect on environmental policy innovation, with a one-standard-deviation increase in environmental spending by IDOs leading environmental policy leadership to increase by 5.70 ($SE = 1.93$, $p < 0.01$) in the short-run and by 11 ($SE = 3.72$, $p < 0.01$) in the long-run. Lobbying on environmental issues by multinational corporations does not appear to have a systematic relationship with environmental policy innovation, nor do the network autocorrelation terms for the three transnational advocates. EU membership is a strong predictor of environmental policy innovation, while OECD membership is negatively related to environmental policy innovation.

These analyses support the proposition that environmental policy innovation should increase in the presence of international environmental NGOs (**H2a**) and with environmental spending by IDOs (**H2b**). However, there is little evidence in favor of the hypothesis that policy innovation would increase with environmental lobbying by multinational corporations (**H2c**).

In alternative model specifications presented in Tables 5.C.2 and 5.C.3, the relationships between environmental policy innovation and international environmental NGOs and IDOs are maintained in most, but not all, model specifications. The coefficient for international environmental NGOs is positive and statistically significant at the 95% confidence level for the model specifications with four years of lags and a broader measure of environmental lobbying by multinational corporations, at the 90% confidence level for OPM, first-difference, and non-linear model specifications, and fails to reach conventional levels of statistical significance in models with three and five years of lags. The coefficient

¹²The full results for environmental policy leadership are presented in tabular form in Table 5.C.1.

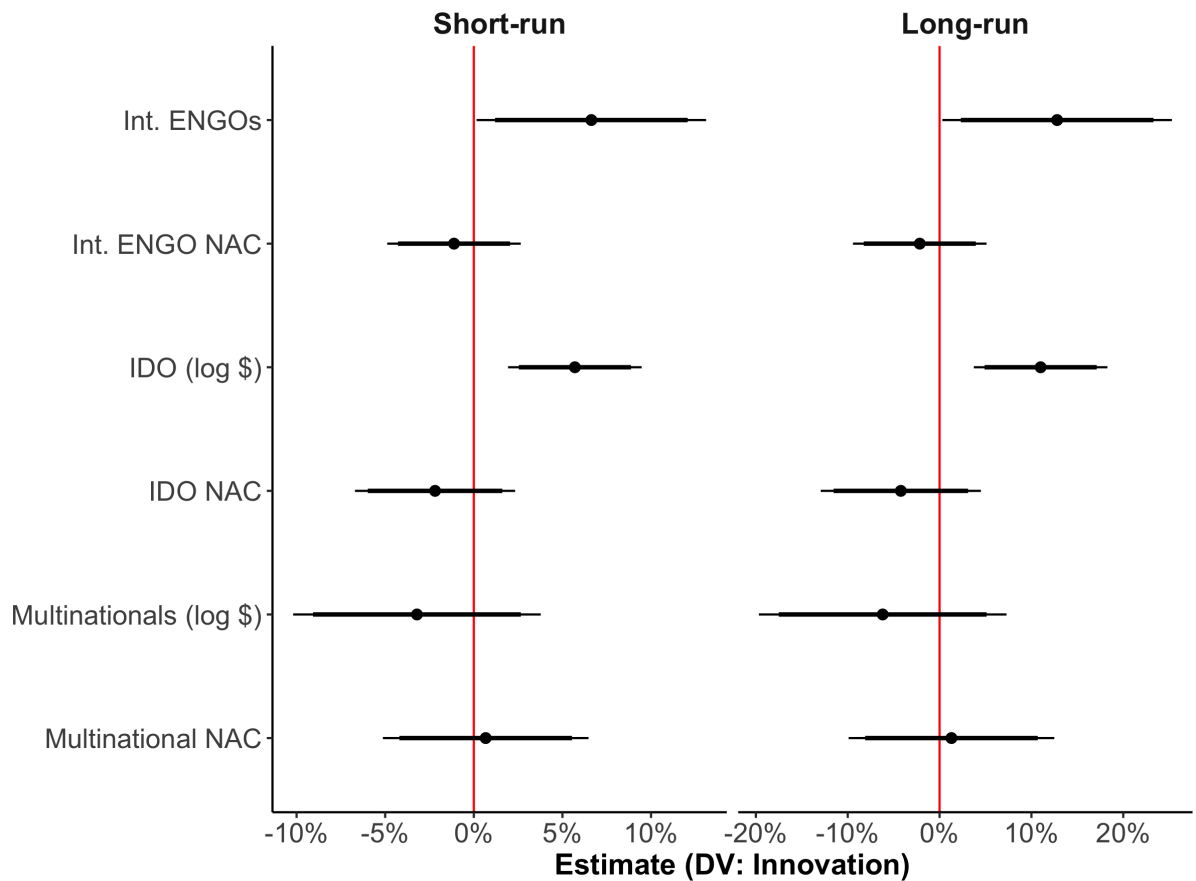


Figure 5.3: Short-run and long-run model estimates for transnational advocacy by large international environmental NGOs, international development organizations, and multinational corporations (DV: Environmental policy innovation).

Heteroskedasticity and serial correlation-robust confidence intervals (90% and 95% levels) for direct and network autocorrelation (NAC) terms.

for IDO environmental spending is positive and statistically significant at the 95% confidence level for the non-linear and a broader measure of corporate environmental lobbying, as well as the models with three, four, five years of lags. Finally, I note that the risk of collinearity among the measures of transnational advocacy is low, as the single highest bivariate correlation among the three measures is $\rho = 0.43$.

5.2.2 Influence

As discussed in Chapter 2, environmental policy influence is a network-based concept in which policy adoptions in leader (source) countries persistently affect the probability of policy adoptions in follower (receiver) countries. Accordingly, I estimate a temporal exponential random graph (TERGM) model with bootstrapped pseudolikelihood estimation, a statistical model designed for network analysis to assess whether countries are more likely to develop a leader-follower environmental policymaking relationship when they share more transnational advocates. TERGMs model the probability of observing a particular arrangement of ties between nodes at a given point in time as a function of node-, dyad-, and network-level exogenous covariates, endogenous features of the network, and temporal dependencies (Leifeld et al. 2018).

I estimate variants of the following model:

$$y_{i \rightarrow j, t} \sim \beta_1 \text{SharedNGOs}_{i, j, t} + \beta_2 \text{IDOSpending}_{i \rightarrow j, t} + \beta_3 \text{SharedMultinationals}_{i, j, t} + \delta \gamma \text{DyadicCovariates}_{i, j, t} + \text{NodalCovariates}_{i \rightarrow j, t} + \alpha \text{EndogenousCovariates}_{N, t} + \phi \text{TemporalDependencies}_{N, t} + \epsilon_{it}$$

The dependent variable, $y_{i \rightarrow j, t}$, is a binary indicator for the existence of a leader-follower environmental policymaking relationship from country i to country j at time t . $\text{SharedNGOs}_{i, j, t}$ is the number of large international environmental NGOs present in both country i and country j at time t . $\text{IDOSpending}_{i \rightarrow j, t}$ is the logged (inverse-sine transformed) amount of environmental ODA spending sent from country i to country j at time t . $\text{Multinationals}_{i, j, t}$ is the number of S&P 500 multinational corporations

present in both country i and country j at time t . *DyadicCovariates* $_{i,j,t}$ represents other relationships between country i and country j that may influence the formation of a leader-follower relationship at time t , namely co-membership in language, colonial, contiguity, trade agreement, and trade flow networks. *NodalCovariates* $_{i+j,t}$ is the set of nodal attributes that may affect the probability of country i acting as a leader to any given country or country j following any given country at time t . These variables consist of the same monadic covariates used in the leadership and innovation model that reflect policymakers' access to information, resources and capacity, and, via institutions, parties, and issue salience, political will to develop environmental policy, as well as leader and follower country fixed effects. Each nodal covariate adds a single variable equal to the sum of the nodal covariate of the potential leader i and the potential follower j . All dyadic and monadic covariates are centered and scaled for ease of interpretation.

A distinguishing feature of TERGMs is the ability to include network-level attributes in addition to node- and dyad-level factors. *EndogenousCovariates* $_{N,t}$ captures attributes of network N that may affect the formation of relationships between countries at time t . I include measures of the density of the influence network (number of ties), the tendency for countries to follow each other (number of mutual relationships), the tendency for countries with many followers to acquire more followers (geometrically-weighted out-degree), the tendency for countries to share multiple followers or leaders in common (geometrically-weighted edgewise shared partners), and the tendency for two countries with shared followers or leaders to form direct relationships (cyclic triplets). Finally, *TemporalDependencies* $_{N,t}$ represents the relationship between the network N at time t and its previous iterations through a term measuring the tendency for ties and non-ties to carry over from one year to the next (dyadic stability), linear time trends, and the tendency for nodes that formed a relationship at time $t - 1$ to form a reciprocal relationship at time t .¹³ Missing data were imputed using Amelia in R (Honaker et al. 2011) and quantities of interest were estimated using btergm in R (Leifeld et al. 2018) using 500 bootstrap replicates. As shown through goodness-of-fit plots in Figure 5.D.1,

¹³See Hunter et al. (2008) and Handcock et al. (2019) for a more in-depth discussion of the endogenous covariates. See Leifeld et al. (2018) for a discussion of the temporal dependency terms.

the model does a good job of accounting for the network’s endogenous dependencies.

I present the estimates for dyadic transnational advocacy terms of interest in Figure 5.4.¹⁴ In line with **H3a**, countries appear to be 3% more likely to form leader-follower environmental policymaking relationships when they share one-standard-deviation (1.23 NGOs) more international environmental NGOs in common than the mean ($\beta_{OR} = 1.03$, $CI_{95} = [1.00; 1.07]$). Similarly, in line with **H3c**, a country that shares with another country one-standard-deviation more S&P 500 companies (11.9 companies) above the mean is 16% more likely to form a leader-follower relationship ($\beta_{OR} = 1.16$, $CI_{95} = [1.13; 1.20]$). However, contrary to the expectations of **H3b**, countries that send environmental ODA funding to another country are slightly less likely to form a leader-follower environmental policymaking relationship ($\beta_{OR} = 0.98$, $CI_{95} = [0.96; 0.99]$). While surprising, this estimate should be viewed with caution due to potential bias from structural zeros.¹⁵

To illustrate the substantive importance of the relationships between environmental policy influence and international environmental NGOs, I calculate the median predicted probability of country i leading country j as a function of the number of NGOs that countries i and j share, conditional on the model and the result of the network.¹⁶ In Figure 5.5a, the probability that a country i is a leader to some other country j when they share no international environmental NGOs in common is 6.7–6.8%. This probability rises as the number of shared international environmental NGOs increases. For a country i that shares eight international environmental NGOs in common with a country j , the probability that country i leads country j is 63–69%.¹⁷

I perform a similar calculation for shared multinational corporations. In Figure 5.5b,

¹⁴See Table 5.D.1 for full results in tabular form.

¹⁵Since nearly all IDOs are agents of developed country governments and work almost exclusively in developed countries, it is possible that I should treat developed-developed and developing-developing country dyads as structural zeros for environmental ODA spending by IDOs. I address this possibility by estimating the model on an influence network restricted to developed-developing country dyads (i.e., a bipartite network consisting of two types of nodes, ODA funders and ODA recipients). As shown in Table 5.D.2, the estimated effect of environmental ODA spending by IDOs is not significantly different from zero at conventional levels of statistical significance.

¹⁶See (Desmarais and Cranmer 2012) and (Czarina et al. 2016) for details.

¹⁷I only show the predicted probabilities up to eight shared international environmental NGOs because only ten countries share more than eight international environmental NGOs in common.

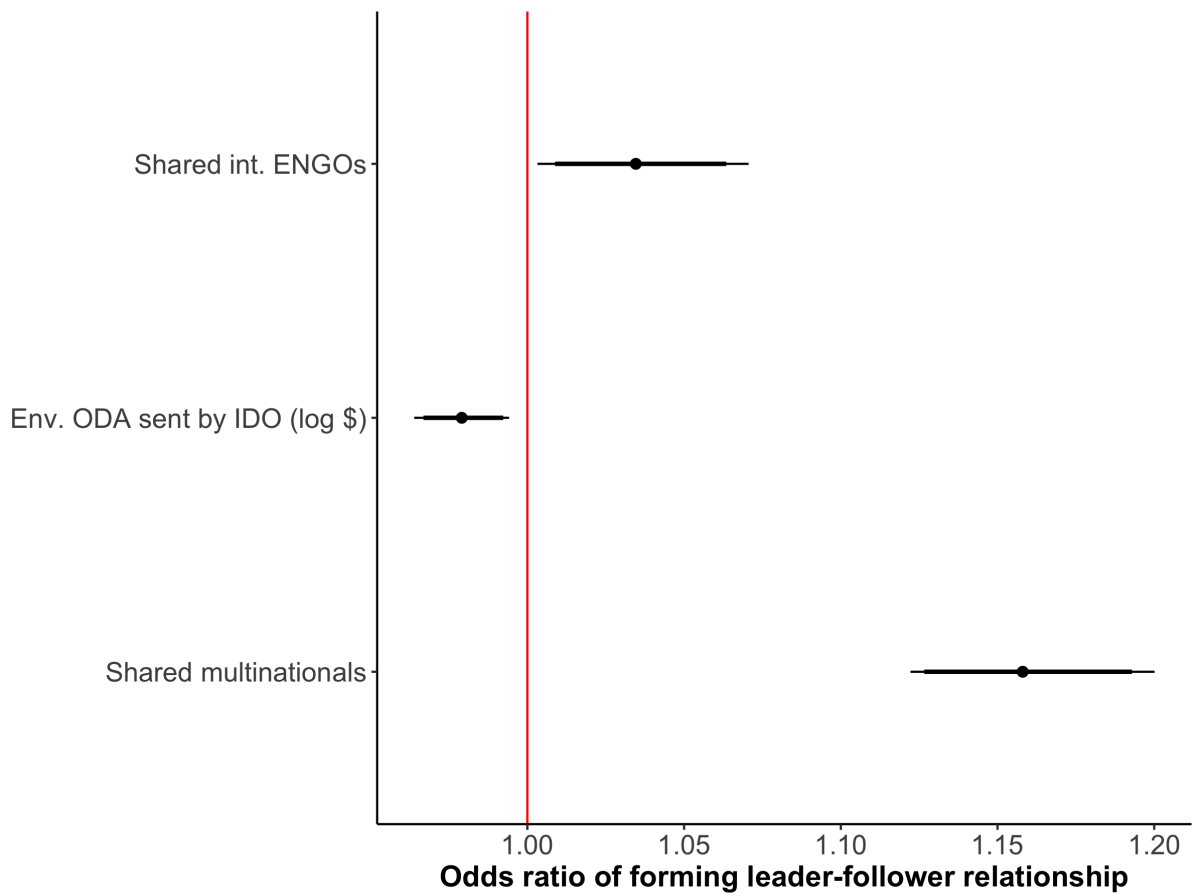
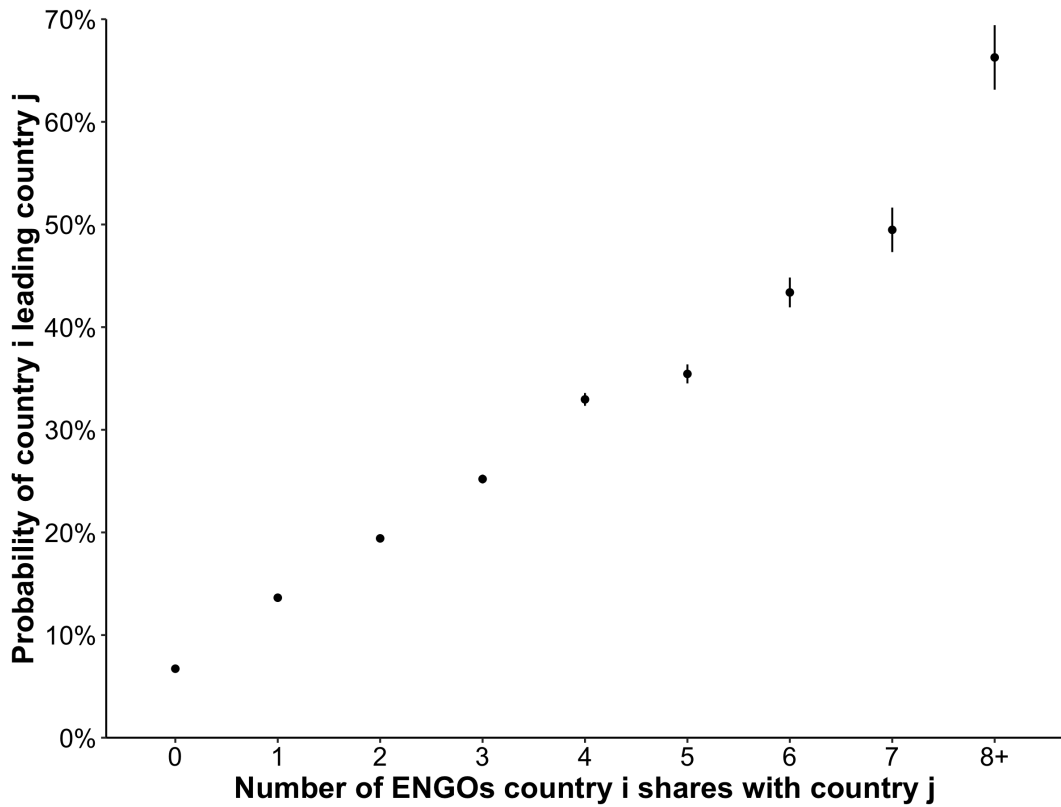
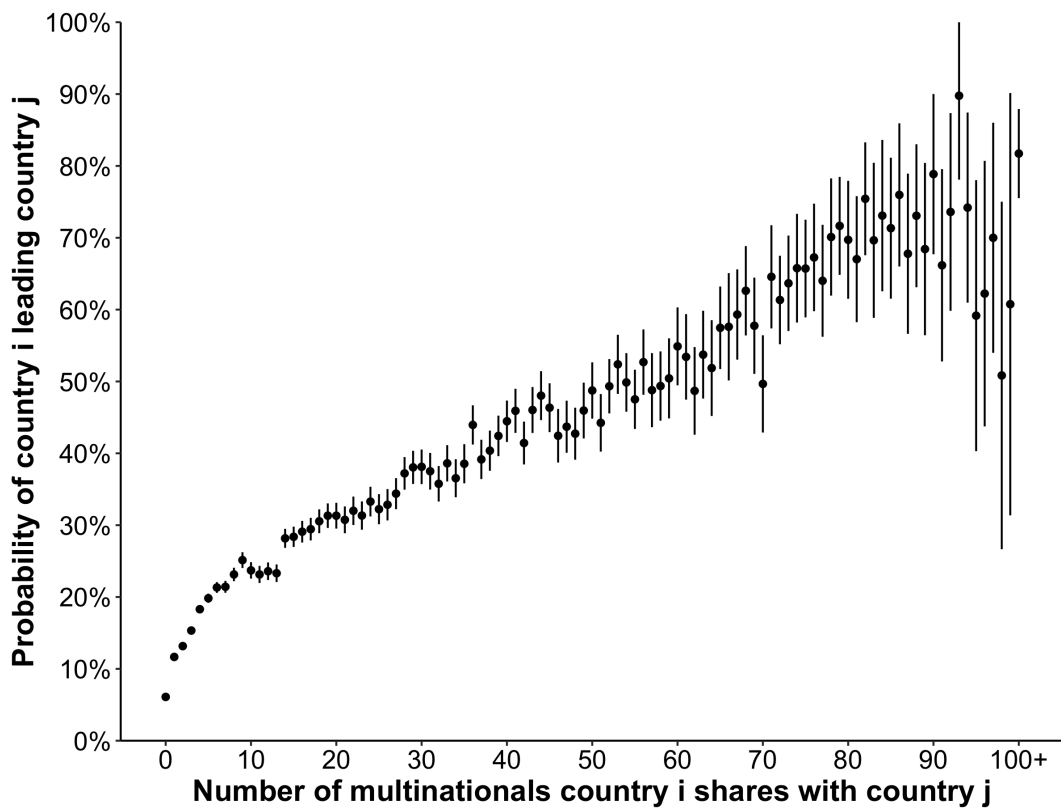


Figure 5.4: Model estimates for transnational advocacy by large international environmental NGOs, international development organizations, and multinational corporations (DV: Environmental policy influence).

Coefficients and confidence intervals (90% and 95%) from a TERGM with 500 bootstrap replicates.



(a) Number of shared international environmental NGOs.



(b) Number of shared multinational corporations.

Figure 5.5: Predicted probability of country i leading country j by number of shared transnational advocates

a country i that shares no S&P 500 corporations in common with a country j has a 6% chance of being a leader to country j . This probability increases such that a country i sharing 5 S&P 500 corporations in common with country j has a 19%-20% chance of being a leader to country j and a probability of approximately 80% if country i shares 100 or more S&P 500 corporations with country j .

I assess the robustness of these results through a suite of robustness checks. I also explore a wide range of model parameterizations, varying the length of the rolling window for inferring leader-follower relationships (Table 5.D.5), the significance threshold for adding edges to the leader-follower network (Table 5.D.4), and the minimum number of adoptions for a policy to be included in the analysis (Table 5.D.3). The main results hold across nearly all these analyses.

These results indicate that transnational advocates, especially large international environmental NGOs and multinational corporations, play an important role in amplifying countries' environmental policymaking influence. These organizations help amplify the international impact of environmental policies by informing policymakers in other countries about policies developed in the other jurisdictions in which these organizations work. Through their activities, transnational advocates help shape the structure of environmental policy leadership.

5.2.3 Summary

Based on the two analyses presented in this section, large international environmental NGOs have a positive, statistically robust, and substantively meaningful effect on both the rate at which governments enact new environmental policies and the influence of the countries with which these organizations work. Multinational corporations appear to play a similar linking role, with countries more likely to influence each others' policymaking when they share more multinational corporations in common. However, corporate environmental lobbying does not have a systematic relationship with environmental policy innovation. Transnational advocates can increase countries' influence without also raising their rate of policy innovation, a result that underscores the importance of examining both

environmental policy leadership and its constituent components.

5.3 Conditions for successful advocacy

The results thus far suggest that international environmental NGOs have a systematic and substantively meaningful impact on environmental policy leadership, both spurring governments to adopt new policies more quickly and helping extend their influence abroad. In contrast, international development organizations and multinational corporations appear to have a limited impact, if any, on environmental policy leadership. In this section, I investigate the conditions under which transnational environmental advocates tend to find success in promoting environmental policy leadership. It is possible that, even if international development organizations and multinationals do not affect environmental policy leadership on average, there may be certain contexts in which these advocates tend to be more successful in playing a role in environmental policy development. Of course, there may also be circumstances in which international environmental NGOs are less effective than others.

I sort the factors that potentially moderate the impact of transnational advocates into three categories. The first category consists of the contextual conditions in which transnational advocates operate. The second category captures the varied approaches to and characteristics of transnational advocacy. The third category speaks to the different issues on which transnational advocates work. I present results probing conditional relationships for each of these aspects of advocacy in turn.

5.3.1 Contextual conditions

Transnational advocates engage with policymakers embedded in a wide range of economic and political contexts, shaping the climate in which advocacy work takes place. I focus on three of the most salient factors: economic development, democracy, and conflict.

5.3.1.1 Economic development

It is not clear from the outset whether the activities of transnational environmental advocates would be enhanced or diminished by a country's level of development. On the one hand, scholars have characterized institutional capacity and economic and human resources as critical for environmental policy leadership (Jänicke 2005; Lenschow et al. 2005). On the other hand, transnational advocates stand to make a larger marginal impact on information access and policymaking resources in developing countries. Steinberg et al. (2001) notes that it is "difficult to find a major conservation policy initiative of the past 35 years in [Costa Rica or Bolivia] that did not receive significant support from overseas" (12). Baldwin et al. (2019) find renewable energy policies diffuse among developing countries differently than among developed countries, but whether these differences generalize to the entire domain of environmental policy is not known.

To test whether transnational advocates are more effective catalysts of environmental policy leadership in developing or developed countries, I ran a set of models in which each transnational advocate's activity interacts with the host country's OECD membership status. As shown in Table 5.2, international environmental NGOs have a positive effect on environmental policy leadership in developing countries ($\beta = 8.48$, $SE = 2.60$, $p < 0.01$) but fail to have an impact on environmental policy leadership in developed countries that is statistically different from zero at conventional levels of significance. Conversely, environmental lobbying by multinational corporations in developing countries is not systematically related to environmental policy leadership, but corporate lobbying in developed countries appears to lead to a steep drop in environmental policy leadership ($\beta = -28.28$, $SE = 13.12$, $p < 0.05$).

These results suggest that international environmental NGOs have their largest impact on environmental policy in developing countries, contexts in which they offer the largest marginal impact in terms of information and capacity building. Corporate environmental lobbying, in contrast, slows the rate of adoption and spread of environmental policies only in developed countries. This finding aligns with the idea that corporations are more open to environmental policy proposals in poorer countries and tend to oppose changes in

Table 5.2: Leadership model results (contextual conditions, OECD membership)

	Int. NGOs		IDO (log \$)		Multinationals (log \$)	
	Short-run	Long-run	Short-run	Long-run	Short-run	Long-run
Transnational advocacy	8.48** (2.60)	16.51** (5.07)	2.14 (1.39)	4.17 (2.71)	-1.12 (4.09)	-2.18 (7.96)
OECD member	4.51 (11.33)	8.79 (22.07)	1.02 (11.57)	1.99 (22.54)	28.79* (14.46)	56.04* (28.16)
Transnational advocacy × OECD member	-6.61 (4.18)	-12.88 (8.14)	-3.75 (2.13)	-7.31 (4.15)	-27.15* (13.36)	-52.85* (26.01)
Combination:Advocacy in OECD	1.86 (3.40)	3.63 (6.62)	-1.61 (2.17)	-3.14 (4.23)	-28.28* (13.12)	-55.02* (25.54)
Controls	Yes	Yes	Yes	Yes	Yes	Yes
Country FE	Yes	Yes	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes	Yes	Yes
N	3366	3366	3366	3366	3366	3366
AIC	2138	2138	2139	2139	2138	2138

*** $p < 0.001$; ** $p < 0.01$; * $p < 0.05$; $p < 0.1$. Coefficients and standard errors from dynamic panel models fitted on 250 imputations. [Arellano et al. \(1987\)](#)-type heteroskedasticity and serial correlation-robust standard errors

environmental policy in wealthier countries.¹⁸

5.3.1.2 Democracy

The effectiveness of transnational advocacy would seem to be enhanced by the presence of policymakers who value environmental quality and have incentives to act accordingly. Political scientists have long argued that non-democracies should under-provide public goods (e.g., [Olson 1993](#); [Lake and Baum 2001](#)), and scholars of environmental politics have found evidence that electoral democracies tend to both have better environmental quality (e.g., [Li and Reuveny 2006](#); [Bernauer and Koubi 2009](#); [Mak Arvin and Lew 2011](#)) and contribute more to public goods like climate change mitigation ([Bättig and Bernauer 2009](#)). However, whether democracies provide more favorable venues for transnational advocacy is a slightly different question. Competition for access is a critical component of successful advocacy ([Scruggs 1999](#)), so external advocates may benefit when authoritarian regimes reduce competition by restricting the activities of domestic

¹⁸See the discussion on this topic in Chapter 3, Section 3.6.3.

advocates. [Aklin and Urpelainen \(2014\)](#) provide an alternative perspective, suggesting that international environmental NGOs could complement their domestic counterparts by focusing their efforts on places where environmental protection is most challenging. Policymakers in authoritarian regimes may be particularly receptive to the advocacy efforts of multinational corporations, as the investments they offer promise economic development as a means of legitimation ([Bruun 2020](#)).

I assess whether the relationship between transnational advocacy and environmental policy leadership is moderated by democracy, I interacted each transnational advocate's activity with the host country's score on the V-DEM polyarchy index, a measure of electoral democracy ([Bernhard et al. 2015](#); [Coppedge et al. 2021](#)). Table 5.3 indicates that international environmental NGOs are effective in both democracies ($\beta = 4.48$, $SE = 2.46$, $p < 0.05$) and authoritarian states ($\beta = 7.55$, $SE = 2.27$, $p < 0.01$), although these organizations may be slightly less effective in democratic countries ($\beta = -3.07$, $SE = 1.80$, $p < 0.10$).

This finding shows that, instead of being limited by the constraints of non-democratic regimes, large international environmental NGOs are *more* effective in autocratic countries. This could reflect the greater competition for influence in electoral democracies, some fundamental compatibility between autocratic policymaking processes and transnational advocates, or simply that international environmental NGOs place particular emphasis on their advocacy efforts in places where domestic environmental NGOs have less room to operate.¹⁹ Neither international development organizations nor multinational corporations seem to have a systematic relationship with environmental policy leadership in more or less democratic countries.

5.3.1.3 Conflict

Developing environmental policy is a costly endeavor, so transnational advocacy should stand to be more effective when policymakers are willing to devote the resources and time

¹⁹A well-established critique of international NGOs is their lack of democratic legitimacy. For an overview, see [Collingwood \(2006\)](#). Investigating this relationship is beyond the scope of this study, but I note it here and leave it as a topic for future research.

Table 5.3: Leadership model results (contextual conditions, electoral democracy)

	Int. NGOs		IDO (log \$)		Multinationals (log \$)	
	Short-run	Long-run	Short-run	Long-run	Short-run	Long-run
Transnational advocacy	7.55*** (2.27)	14.72*** (4.42)	1.55 (1.38)	3.01 (2.68)	-1.34 (4.08)	-2.62 (7.97)
Electoral democracy	-1.14 (3.21)	-2.22 (6.25)	0.01 (3.05)	0.02 (5.95)	-0.75 (3.39)	-1.47 (6.62)
Transnational advocacy × Electoral democracy	-3.07 (1.80)	-5.99 (3.50)	-0.29 (0.92)	-0.56 (1.80)	-1.30 (2.24)	-2.54 (4.38)
Combination:Advocacy in democracies	4.48* (2.46)	8.73* (4.80)	1.26 (1.57)	2.45 (3.07)	-2.64 (4.67)	-5.16 (9.13)
Controls	Yes	Yes	Yes	Yes	Yes	Yes
Country FE	Yes	Yes	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes	Yes	Yes
N	3366	3366	3366	3366	3366	3366
AIC	2137	2137	2141	2141	2141	2141

*** $p < 0.001$; ** $p < 0.01$; * $p < 0.05$; $p < 0.1$. Coefficients and standard errors from dynamic panel models fitted on 250 imputations. [Arellano et al. \(1987\)](#)-type heteroskedasticity and serial correlation-robust standard errors

to environmental issues. One circumstance in which policymakers should be particularly reticent to do so is when the country is experiencing widespread armed conflict. During times of war, concerns about environmental protection are often given lower priority or even set aside entirely. For example, the Syrian civil war led to widespread deforestation and, due to the use of chemical and explosive weapons, soil and water contamination ([Gafaar 2021](#)). However, it is also possible that the outbreak of war primarily affects the stringency of environmental policies rather than the rate at which they are adopted and spread. Policymakers continue to work during an armed conflict and, with the army taking a more active role on security issues, there may actually be more time (if not financial resources) for policymakers to work on social issues like environmental protection.

To ascertain whether armed conflict moderates the relationship between transnational advocacy and environmental policy leadership, I interacted each transnational advocate's activity with an indicator of whether the host country was the location of 1,000 or more battle deaths in each year ([Gleditsch et al. 2002](#); [Pettersson and Öberg 2020](#)).

Table 5.4: Leadership model results (contextual conditions, armed conflict)

	Int. NGOs		IDO (log \$)		Multinationals (log \$)	
	Short-run	Long-run	Short-run	Long-run	Short-run	Long-run
Transnational advocacy	6.99** (2.30)	13.59** (4.47)	1.40 (1.38)	2.73 (2.70)	-1.53 (4.08)	-2.98 (7.96)
Armed conflict	-6.79 (5.86)	-13.22 (11.39)	-6.89 (6.29)	-13.43 (12.26)	-6.65 (5.57)	-12.96 (10.85)
Transnational advocacy × Armed conflict	6.62 (5.77)	12.87 (11.22)	3.63 (7.16)	7.07 (13.96)	4.13 (5.77)	8.05 (11.24)
Combination:Advocacy in conflicts	13.61** (5.81)	26.46** (11.30)	5.03 (6.94)	9.80 (13.53)	2.60 (6.71)	5.06 (13.07)
Controls	Yes	Yes	Yes	Yes	Yes	Yes
Country FE	Yes	Yes	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes	Yes	Yes
N	3366	3366	3366	3366	3366	3366
AIC	2139	2139	2141	2141	2140	2140

*** $p < 0.001$; ** $p < 0.01$; * $p < 0.05$; $p < 0.1$. Coefficients and standard errors from dynamic panel models fitted on 250 imputations. [Arellano et al. \(1987\)](#)-type heteroskedasticity and serial correlation-robust standard errors

These analyses, presented in Table 5.4, suggest that conflict does not systematically moderate the relationship between transnational advocacy and environmental policy. International environmental NGOs have a positive and significant effect on environmental policy leadership in countries at peace ($\beta = 6.99$, $SE = 2.30$, $p < 0.01$) and at war ($\beta = 13.61$, $SE = 5.81$, $p < 0.01$), while neither IDOs nor multinational corporations appear to have a systematic relationship with environmental policy leadership without regard to a country's conflict status.

5.3.1.4 Summary

Based on the three preceding analyses, it appears that, while generally in support of the findings reported earlier in the chapter, the moderating effect of a country's political and economic contexts works differently for different advocates. The activities of international environmental NGOs tend to increase environmental policy leadership primarily in developing countries, regardless of the extent to which these countries are democratic or experiencing conflict. In contrast, environmental lobbying by multinational

corporations appears to reduce environmental policy leadership in wealthy countries, while having little impact in other contexts. Spending on environmental projects by international development organizations does not have a systematic relationship with environmental policy leadership in any of these contexts, suggesting that their projects may rely on, rather than create, the political enabling environments on which they depend.

5.3.2 Organizational characteristics

Beyond the broader context in which transnational advocates work, it is also important to consider the organizational characteristics of the transnational advocates themselves. I focus on three such characteristics: the organization's past activities in a country, collaborative or confrontational advocacy styles, and opportunities for multistakeholder advocacy. I discuss each of these characteristics in turn.

5.3.2.1 Past activity

The longer an advocacy organization is active in a country, the more opportunities they have to build an image of legitimacy and gain access to policymakers. In contrast, an organization that is only intermittently active in a country would be obliged to re-create connections and context-specific knowledge, likely leading the organization to be less effective at influencing policy processes. Accordingly, a transnational advocacy organization's past activities in a country may condition its ability to impact environmental policy development in the present.

I examine the moderating role of past advocacy activities on the relationship between transnational advocacy and environmental policy leadership by interacting the current measure of each transnational advocate's activities with its value in the prior year. This formulation allows me to test if advocates are more effective in a given country in the

Table 5.5: Leadership model results (organizational characteristics, past advocacy)

	Int. NGOs		IDO (log \$)		Multinationals (log \$)	
	Short-run	Long-run	Short-run	Long-run	Short-run	Long-run
Transnational advocacy	7.86** (2.72)	15.34** (5.30)	0.69 (1.31)	1.35 (2.55)	-1.05 (4.29)	-2.05 (8.38)
Transnational advocacy _{t-1}	0.51 (2.49)	0.99 (4.87)	2.70* (1.31)	5.25* (2.55)	-0.71 (4.14)	-1.38 (8.09)
Transnational advocacy × Transnational advocacy _{t-1}	-1.12 (1.45)	-2.18 (2.83)	0.20 (0.99)	0.39 (1.92)	2.20 (2.53)	4.30 (4.94)
Combination:Advocacy + Past Advocacy	6.74** (2.57)	13.16** (5.01)	0.89 (1.49)	1.74 (2.91)	1.16 (4.83)	2.25 (9.44)
Controls	Yes	Yes	Yes	Yes	Yes	Yes
Country FE	Yes	Yes	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes	Yes	Yes
N	3366	3366	3366	3366	3366	3366
AIC	2141	2141	2136	2136	2141	2141

*** $p < 0.001$; ** $p < 0.01$; * $p < 0.05$; $p < 0.1$. Coefficients and standard errors from dynamic panel models fitted on 250 imputations. [Arellano et al. \(1987\)](#)-type heteroskedasticity and serial correlation-robust standard errors

present if they were also active in that country in the previous year.²⁰ Table 5.5 shows that there is little sign of past advocacy activities conditioning the impact of current advocacy, with international environmental NGOs continuing to catalyze environmental policy leadership in countries where they both were active in the previous year ($\beta = 7.86$, $SE = 2.72$, $p < 0.01$) and where they were not previously active ($\beta = 6.74$, $SE = 2.57$, $p < 0.01$). Neither international development organizations nor multinational corporations display evidence of systematic relationships with environmental policy leadership at low or high levels of past environmental spending.

5.3.2.2 Collaborative or confrontational advocacy styles

A second organizational characteristic of transnational advocates is advocacy style. Focusing on international environmental NGOs, there are two broad types of approaches

²⁰An important limitation of this test is that I use measures of transnational advocacy that represent the collective activities of multiple individual organizations. Aggregating across organizations may fail to capture, for example, one NGO leaving a country organization as another enters. However, this approach is more attractive than other alternatives, such as recalculating advocacy measures using arbitrary weights representing past advocacy activities.

to environmental activism. The conventional stereotype of international environmental NGOs is that of brash, disruptive activists who do not hesitate to use confrontational tactics to make headlines and build pressure for change. Organizations that use these outsider tactics include the likes of Greenpeace, Friends of the Earth, and Global Witness. However, there is a set of quieter, more conventional advocacy organizations that take more of a collaborative approach to policy advocacy, often opting to present informational seminars, training workshops, and voluntary initiatives intended to strengthen like-minded allies within the organizational structures of governments and polluters alike. Many the giants of the international environmental NGO sector take these insider approaches, including the World Resources Institute, the World Wildlife Fund, The Nature Conservancy, and Conservation International. The selection of confrontational or collaborative strategies is a subject of considerable scholarship, both in general (e.g., [Stroup and Wong 2017](#)) and specific tactical circumstances (e.g., [Hadden 2015](#)). Despite this body of work, it remains unknown both whether one advocacy style tends to produce higher levels of environmental policy leadership than another and whether the combined presence of confrontational and collaborative organizations reinforces or diminishes each other's respective effectiveness.

To ascertain whether organizations that tend to use confrontational or collaborative tactics see greater environmental policy leadership, I identified which of the eleven largest international environmental NGOs use primarily confrontational (N=4) or primarily collaborative (N=7) advocacy styles.²¹ I then counted the number of NGOs of each advocacy style present in each country between 2001 and 2019.

As presented in [Table 5.6](#), governments tend to increase their level of environmental policy leadership in the presence of both confrontational international environmental NGOs ($\beta = 5.64$, $SE = 2.13$, $p < 0.01$) and collaborative international environmental NGOs ($\beta = 2.66$, $SE = 1.61$, $p < 0.1$), with no significant difference in the estimates for

²¹Specifically, I classified Friends of the Earth, Global Witness, Greenpeace, and Oceana as using a confrontational advocacy style due to their campaign-driven approach and frequent use of naming-and-shaming tactics. I classify Conservation International, Flora and Fauna International, the Rainforest Alliance, The Nature Conservancy, the World Resources Institute, World Wildlife Fund, and World Conservation Society as using a collaborative advocacy style due to their willingness to partner with governments and polluters and their emphasis on technical and programming interventions.

the two types of NGO advocacy styles. However, when the measures of collaborative and confrontational advocacy styles are interacted with one another, they appear to undermine each other. Collaborative NGOs are less effective in the presence of confrontational NGOs ($\beta = -2.05$, SE= 1.12, $p < 0.10$) but continue to have a positive and statistically significant impact on environmental policy leadership ($\beta = 4.20$, SE = 2.18, $p < 0.05$). Confrontational NGOs see their impact diminish in the presence of collaborative NGOs such that they no longer have an effect on environmental policy leadership distinguishable from zero at conventional levels of statistical significance ($\beta = 1.55$, SE= 1.55, $p < 1.58$).

These results should be treated with caution, as the interaction only attains a significance level of 90%, but they suggest that rather than finding synergies in their insider and outsider tactics, collaborative and confrontational international environmental NGOs diminish their respective impacts on environmental policy leadership. It is frequently the case that NGOs with different advocacy styles work on the same issues in the same countries.²² This analysis suggests that when international environmental NGOs with different advocacy styles are both present, both types of organizations see their catalytic effect on environmental policy leadership weaken.

5.3.2.3 Opportunities for multistakeholder advocacy

Collaboration among different types of environmental policy advocates, often referred to as multistakeholder approaches, has become increasingly popular in recent years (Berman 2017; Gray and Purdy 2018). For example, the World Bank hosts the 2030 Water Resources Group, an initiative organized by private, public, and civil society groups to strengthen water management in fourteen countries.²³ While the presence of different types of environmental policy advocates in the same country creates opportunities for multistakeholder advocacy, it may also raise the level of competition for access to the

²²One such example is big game conservation in Africa, which has seen a lively debate among NGOs over the merits of raising funds for conservation through trophy hunting (Lindsey et al. 2006).

²³The founding members of the 2030 Water Resources Group include Nestlé, PepsiCo, The Coca-Cola Company, the Swiss Agency for Development and Cooperation, the International Finance Corporation, and the World Wildlife Fund <https://www.2030wrg.org/about-us/background/>, accessed June 15, 2021.

Table 5.6: Leadership model results (organizational characteristics, advocacy style)

	Direct		Interaction	
	Short-run	Long-run	Short-run	Long-run
Collaborative int. ENGOs	5.64** (2.13)	11.00** (4.17)	6.25** (2.18)	12.20** (4.26)
Confrontational int. ENGOs	2.66 (1.61)	5.19 (3.15)	3.60* (1.82)	7.03* (3.55)
Collaborative int. ENGOs × Confrontational int. ENGOs			-2.05 (1.12)	-4.01 (2.19)
Collaborative effect (w/ Confrontational)			4.20* (2.18)	8.19* (4.25)
Confrontational effect (w/ Collaborative)			1.55 (1.58)	3.03 (3.08)
Controls	Yes	Yes	Yes	Yes
Country FE	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes
N	3366	3366	3366	3366
AIC	2140	2140	2138	2138

*** $p < 0.001$; ** $p < 0.01$; * $p < 0.05$; $p < 0.1$. Coefficients and standard errors from dynamic panel models fitted on 250 imputations. [Arellano et al. \(1987\)](#)-type heteroskedasticity and serial correlation-robust standard errors

policymaking process.

To understand how the presence of different types of transnational advocates moderates their impact on environmental policy leadership, I interacted the measures for international environmental NGOs, IDOs, and multinational corporations together in a three-way interaction. As shown in Table 5.7, there is limited evidence that the effectiveness of transnational advocates depends on the activities of other types of transnational advocates. None of the interactions among international environmental NGOs, IDOs, and multinationals reach conventional levels of statistical significance. International environmental NGOs maintain their positive relationship with environmental policy leadership in the presence of IDOs and corporate environmental lobbying ($\beta = 4.68$, SE= 3.25, $p < 0.10$) while multinationals display a negative impact on environmental policy leadership when international environmental NGOs and IDOs are present ($\beta = 6.38$, SE= 4.48, $p < 0.10$). However, considering the risk of Type I errors under multiple testing, caution should be exercised in interpreting these relationships.

5.3.2.4 Summary

In this subsection, I considered whether and the extent to which the organizational characteristics of transnational advocates moderates their impact on environmental policy leadership. I found little evidence that the past activities of transnational advocates affect their impact on environmental policy leadership, but organizations' varied advocacy styles appear to be more important. International environmental NGOs that use collaborative or confrontational policy advocacy strategies increase environmental policy leadership, but when both types of organizations are present, both see their effect on environmental policy leadership diminish. Finally, despite the growing prevalence of multistakeholder approaches to environmental advocacy, there seem to be few synergies at work when multiple types of transnational advocates are active in the same country.

Table 5.7: Leadership model results (organizational characteristics, multistakeholder advocacy)

	Short-run	Long-run
Int. ENGOs	7.23**	14.07**
	(2.32)	(4.52)
IDO (log \$)	1.91	3.72
	(1.48)	(2.87)
Multinationals (log \$)	1.22	2.37
	(1.00)	(1.95)
Int. ENGOs \times IDO (log \$)	-1.51	-2.94
	(3.97)	(7.73)
Int. ENGOs \times Multinationals (log \$)	-2.95	-5.74
	(2.06)	(4.00)
IDO (log \$) \times Multinationals (log \$)	-1.10	-2.14
	(0.94)	(1.82)
Int. ENGOs \times IDO (log \$) \times Multinationals (log \$)	-0.82	-1.60
	(0.99)	(1.93)
NGOs + NGOs \times IDO + NGOs \times Multinational + NGOs \times IDO \times Multinational	4.68	9.10
	(3.25)	(6.31)
IDO + NGOs \times IDO + NGOs \times IDO \times Multinational	1.21	2.36
	(1.91)	(3.72)
Multinational + NGOs \times Multinational + IDO \times Multinational + NGOs \times IDO \times Multinational	-6.38	-12.41
	(4.48)	(8.72)
Controls	Yes	Yes
Country FE	Yes	Yes
Year FE	Yes	Yes
N	3366	3366
AIC	2141	2141

*** $p < 0.001$; ** $p < 0.01$; * $p < 0.05$; dot $p < 0.1$. Coefficients and standard errors from dynamic panel models fitted on 250 imputations. Arellano et al. (1987)-type heteroskedasticity and serial correlation-robust standard errors

5.4 Issue characteristics

The third and final set of factors that conditions potentially affecting the relationship between transnational advocacy and environmental policy leadership is variation in the issues on which transnational advocates choose to work. In particular, I consider variation in the complexity of different environmental policies and whether their content speaks to traditional environmental governance issues. I discuss each of these factors in turn.

5.4.1 Issue complexity

Environmental policies that cut across many issue areas affect a wider range of stakeholders and likely involve multiple ministries with relevant portfolios. When more veto players (and more players in general) are involved in the policymaking process, it tends to be more difficult to enact policy change (Tsebelis et al. 2002). Accordingly, transnational advocates, like other advocates, could be expected to be less effective in accelerating the rate of adoption and spread of more complex policies. Alternatively, more complex policies tend to be more technical, receive less public attention, and, as a result, attract less competition for access to policymakers among interested parties.

To assess if the effectiveness of transnational advocates in catalyzing environmental policy leadership depends on policy complexity, I calculated alternative environmental policy leadership scores in which each policy is weighted by its average number of subjects, rounded to the nearest whole number.²⁴ The weighting procedure consisted of creating as many duplicates of each policy as its average policy complexity, with an average policy complexity of 2.56 subjects and a standard deviation of 1.08 subjects. I then replaced the environmental policy leadership measure with its complexity-weighted alternative.

As shown in Table 5.8, international environmental NGOs have a positive and statistically significant effect on environmental policy leadership, even when more complex policies are given more weight in the calculation of environmental policy leadership scores ($\beta = 6.65$, $SE = 2.26$, $p < 0.01$). The point estimate is slightly lower than for the

²⁴To illustrate, if a policy banning the fishing of mackerel was adopted by two countries, one in a law touching on fisheries and the other in a law relating to fisheries, marine issues, and water, the policy would have an average policy complexity of two subjects.

unweighted scores (Table 5.B.1), but they are not different at conventional levels of statistical significance. The estimates for international development organizations and multinational corporations are not significantly different from zero, nor are the estimates for the network autocorrelation terms.

5.4.2 Traditional and secondary environmental issues

Legitimacy, deriving both from constituency representation and technical expertise, is thought to be a key element to successful advocacy (Stroup and Wong 2017). For large international environmental NGOs, there is a set of traditional environmental issues on which the relevance of their knowledge and social authority is clear. These traditional issues revolve around flora, fauna, and environmental media, in contrast to issues relating to natural resource use. The latter can be characterized as secondary environmental issues, meaning that while policy debates on these natural resource use issues may have some connection with environmental governance, they tend to have more direct ties to economic production than traditional environmental issues.²⁵ As discussed in Chapter 3, of the fifteen topics in the FAOLEX dataset, there are ten traditional environmental issues—air & atmosphere, energy, environmental procedures (e.g., environmental impact assessment), fisheries, forestry, land & soil, mineral resources, waste & hazardous substances, water, and wild species & ecosystems—and five are secondary environmental issues—agricultural & rural development, cultivated plants, food & nutrition, livestock, and marine issues. International environmental NGOs would seem to be the most likely type of transnational advocate to have a higher level of effectiveness in advocating for environmental policy leadership on traditional environmental issues, as IDOs and multinational corporations tend to engage on a broader set of policy topics. By this same logic, international environmental NGOs may concentrate their advocacy efforts on traditional environmental policy topics in the belief that they have more legitimacy, and thus stand to be more effective, on these issues.

To assess whether transnational advocates' effect on environmental policy leadership

²⁵These issues most realistically lie on a spectrum, but a binary classification is sufficient for the purposes of this analysis.

Table 5.8: Leadership model results (issue characteristics, issue complexity)

	Leadership weighted by issue complexity	
	Short-run	Long-run
Int. ENGOs	6.65 (2.26)**	14.19 (4.83)**
Int. ENGO NAC	0.79 (1.30)	1.69 (2.78)
IDO (log \$)	1.27 (1.32)	2.72 (2.81)
IDO NAC	-0.68 (1.01)	-1.45 (2.15)
Multinationals (log \$)	-4.15 (3.72)	-8.85 (7.94)
Multinational NAC	2.24 (2.17)	4.78 (4.62)
Dom. ENGOs (log #)	2.22 (1.91)	4.73 (4.08)
CSO consultation	0.53 (1.90)	1.13 (4.07)
Globalization	7.20 (6.90)	15.35 (14.72)
GDP (\$/pc)	0.05 (6.64)	0.08 (14.18)
Env. ministry	-0.18 (4.21)	-0.39 (8.99)
Veto players	-0.00 (0.93)	-0.00 (1.99)
Electoral democracy	-0.50 (2.96)	-1.07 (6.32)
Federalism	-1.45 (4.99)	-3.08 (10.65)
EU member	20.53 (7.80)**	43.83 (16.64)**
Left government	-0.36 (1.79)	-0.77 (3.81)
Green party	7.35 (3.90)	15.69 (8.32)
GHG emissions (log tons)	1.29 (2.77)	2.74 (5.90)
Resource rents (% GDP)	4.99 (3.18)	10.65 (6.80)
Agricultural land (% area)	-1.14 (3.93)	-2.44 (8.40)
Armed conflict	-4.37 (4.77)	-9.34 (10.18)
Language NAC	-5.10 (3.69)	-10.89 (7.88)
Contiguity NAC	-1.24 (2.62)	-2.65 (5.60)
Colonial NAC	2.44 (2.35)	5.20 (5.02)
Trade agreement NAC	1.21 (1.81)	2.57 (3.86)
Trade flow NAC	1.55 (1.78)	3.31 (3.79)
ρ_{t-1}	58.85 (3.40)***	
ρ_{t-2}	-5.70 (2.24)*	
Country FE	Yes	Yes
Year FE	Yes	Yes
N	3366	3366
AIC	1874	1874

*** $p < 0.001$; ** $p < 0.01$; * $p < 0.05$; $p < 0.1$. Coefficients and standard errors from dynamic panel models fitted on 250 imputations. [Arellano et al. \(1987\)](#)-type heteroskedasticity and serial correlation-robust standard errors

is different for traditional and secondary environmental issues, I calculated alternative environmental policy leadership scores, one for policies primarily relating to traditional environmental issues and one for policies relating primarily to secondary environmental issues. Since I had data on the specific issues on which multinationals engaged in lobbying, I also calculated measures of corporate environmental lobbying on traditional and secondary environmental issues.

As displayed in Table 5.9, it appears that international environmental NGOs are effective at catalyzing environmental policy leadership on traditional environmental issues ($\beta = 8.86, SE = 2.53, p < 0.001$). In contrast, international environmental NGOs do not generate increases in environmental policy leadership that attain conventional levels of statistical significance. This result indicates that the effect of international environmental NGOs on environmental policy leadership varies from issue to issue, with the implication that these organizations' efforts on policies relating to flora, fauna, and pollution tend to be more fruitful than their advocacy on resource use issues. Why this might be so, and the practical implications of this relationship for addressing resource degradation, is an issue worthy of future research. The estimates for IDOs and multinationals are not significant at conventional levels of statistical significance, nor are the network autocorrelation terms.

5.5 Conclusion

In this chapter, I evaluated the empirical relationship between the activities of transnational advocates and environmental policy leadership. I found that large international environmental NGOs have a positive, statistically significant, and substantively meaningful effect on environmental policy leadership and its constituent components, environmental policy innovation and influence. Countries with multinational corporate activity in common have an increased probability of forming an environmental policymaking leader-follower relationship, but corporate environmental lobbying expenditures do not increase environmental policy leadership in general. On average, environmental overseas development assistance by international development organizations does not tend to have an

Table 5.9: Leadership model results (issue characteristics, traditional and secondary environmental issues)

	Traditional environmental issues		Secondary environmental issues	
	Short-run	Long-run	Short-run	Long-run
Int. ENGOs	9.27 (2.53)***	17.23 (4.70)***	4.09 (2.96)	7.76 (5.62)
Int. ENGO NAC	0.34 (1.58)	0.63 (2.94)	0.96 (1.56)	1.82 (2.95)
IDO (log \$)	1.37 (1.40)	2.55 (2.61)	0.34 (1.26)	0.65 (2.39)
IDO NAC	-0.26 (1.29)	-0.48 (2.41)	0.27 (1.02)	0.51 (1.93)
Multinationals (log \$) (traditional issues)	-2.28 (3.84)	-4.25 (7.14)		
Multinational NAC (traditional issues)	-0.53 (2.47)	-0.99 (4.59)		
Multinationals (log \$) (secondary issues)			-0.20 (3.21)	-0.39 (6.09)
Multinational NAC (secondary issues)			-1.51 (2.35)	-2.86 (4.45)
Country FE	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes
N	3366	3366	3366	3366
AIC	2709	2709	2478	2478

*** $p < 0.001$; ** $p < 0.01$; * $p < 0.05$; $^{cdot}p < 0.1$. Coefficients and standard errors from dynamic panel models fitted on 250 imputations. Arellano et al. (1987)-type heteroskedasticity and serial correlation-robust standard errors

impact on environmental policy leadership, innovation, or influence.

Since these conclusions speak to average effects, I examined how the relationship between transnational advocacy and environmental policy leadership is moderated by changing contextual conditions, organizational characteristics, and the issues on which advocates work.

International environmental NGOs are particularly effective catalysts of environmental policy leadership across a variety of political and economic contexts and levels of policy complexity. One novel finding from this analysis is that large international environmental NGOs with confrontational or collaborative advocacy styles appear to be effective at sparking environmental policy leadership, although when organizations with contrasting advocacy styles are present at the same time, environmental policy leadership does not tend to increase. This slower pace of environmental policy development could be normatively good or bad. For example, confrontational NGOs might generally advocate that policymakers adopt their favored environmental policies, but resist the passage and

spread of less stringent policies that collaborative NGOs would tend to endorse. The presence of both types of advocacy styles may lead to a lower overall increase in environmental policy leadership but with policy changes of a higher level of environmental protection.

These environmental NGOs are also primarily effective on traditional environmental issues relating to flora, fauna, and environmental media. In contrast, these advocates have a weaker impact, if any, on secondary environmental issues relating to resource use. This result supports the view that the effectiveness of advocates depends on their relationship to the policy issue at hand. However, without more issue-specific data on NGO activity, it is challenging to disentangle the effect of legitimacy from variation in advocacy effort across different issues.

It is also instructive to compare the results of the influence analysis and the leadership analysis for international environmental NGOs (Fig 5.4). On the one hand, countries that share more international environmental NGOs in common are more likely to form leader-follower relationships. However, the estimates for the network correlation terms for environmental policy leadership were small and lacked statistical significance (Fig 5.1). One possibility for reconciling these results is that transnational advocates are not primarily serving as conduits for communicating environmental policy changes by environmental policy leaders. Instead, transnational advocates may be strategic when they link policymakers in different countries, perhaps reflecting a preference for amplifying the international impact of favored environmental policies. In future work, this possibility could be explored by considering whether transnational advocates like international environmental NGOs are more likely to play a linking role for environmental policies with high stringency.

While international development organizations did not have a systematic impact on environmental policy leadership across these different conditions, the effect of environmental lobbying by multinational corporations is more nuanced. In particular, multinationals appear to have a null effect on environmental policy leadership in developing countries, but a large negative effect on environmental policy leadership

in developed countries. This result suggests that corporate environmental lobbying is different in developed countries relative to developing countries. One possibility is that multinationals tend to lobby for the status quo in developed countries, slowing the pace of policy development, but sometimes lobby for policy change in developing countries that may lack the environmental laws and regulations multinationals need to pursue their business strategy successfully.

Finally, it is worthwhile to note that the effects of transnational advocates did not seem to be systematically moderated by the activities of other types of transnational advocates. Understanding when and how advocates work or compete with each other, and what these relationships mean for effectiveness, is an important area for future work.

Appendix 5.A Summary statistics

Table 5.A.1: Summary statistics

Statistic	Mean	St. Dev.	Min	Pctl(25)	Pctl(75)	Max
Year	2009.50	5.77	2000	2004.8	2014.2	2019
Env. policy leadership	50.47	29.84	0.00	26.33	75.43	99.30
Int. ENGOs	2.63	2.48	0	1	4	11
Int. ENGO NAC	0.49	0.28	0	0.5	0.7	1
IDO (log \$)	2.18	1.86	0	0	3.6	9
IDO NAC	0.07	0.20	0	0	0	1
Multinationals (log \$)	5.68	4.62	0	0	10.1	15
Multinational NAC	0.43	0.32	0	0	0.7	1
Dom. ENGOs (log #)	1.25	1.06	0	0	1.7	6
CSO consultation	0.85	1.33	-2.48	0.04	1.64	10.87
Globalization	58.52	15.35	23.61	46.80	69.74	91.35
GDP (\$ p.c.)	9.86	1.18	7.14	8.93	10.80	12.34
Env. ministry	0.70	0.43	0	0.2	1	1
Veto players	2.66	1.60	1	1	4	17
Electoral democracy	0.53	0.26	0.01	0.31	0.77	1.00
Federalism	0.08	0.23	0	0	0	1
EU member	0.13	0.34	0	0	0	1
OECD member	0.17	0.38	0	0	0	1
Left governmnet	0.52	0.36	0.00	0.18	0.75	1.00
Green party	0.45	0.50	0	0	1	1
GHG emissions (log tons)	4.08	2.28	-5.88	2.86	5.51	10.06
Resource rents (% GDP)	1.82	1.45	0.00	0.43	3.06	5.15
Agricultural land (% area)	39.18	21.24	0.45	21.23	55.05	85.49
Armed conflict	0.03	0.18	0	0	0	1
Language NAC	0.41	0.22	0.00	0.35	0.57	0.95
Contiguity NAC	0.39	0.25	0.00	0.20	0.57	0.98
Colonial NAC	0.47	0.28	0.00	0.33	0.66	0.99
Trade agreement NAC	0.48	0.15	0	0.4	0.6	1
Trade flow NAC	0.51	0.16	0.00	0.44	0.62	0.92

Missing values estimated using 250 imputations. Variables measured multiple ways (e.g., weighting by policy complexity) not shown.

Appendix 5.B Leadership model results

Table 5.B.1: Leadership model results

	Main model	
	Short-run	Long-run
Int. ENGOs	7.22 (2.27)**	14.09 (4.44)**
Int. ENGO NAC	0.33 (1.34)	0.65 (2.61)
IDO (log \$)	1.49 (1.37)	2.90 (2.68)
IDO NAC	-0.50 (1.10)	-0.97 (2.14)
Multinationals (log \$)	-1.47 (4.08)	-2.88 (7.96)
Multinational NAC	-0.18 (2.35)	-0.34 (4.59)
Information		
Dom. ENGOs (log #)	4.16 (1.99)*	8.10 (3.87)*
CSO consultation	1.10 (2.02)	2.14 (3.95)
Globalization	8.96 (7.43)	17.47 (14.49)
Resources/capacity		
GDP (\$/pc)	-2.55 (7.13)	-4.99 (13.92)
Env. ministry	0.19 (4.74)	0.37 (9.26)
Veto players	0.92 (1.01)	1.79 (1.96)
Political will (institutions)		
Electoral democracy	-0.09 (3.08)	-0.18 (6.00)
Federalism	-1.20 (5.84)	-2.33 (11.40)
EU member	20.92 (7.75)**	40.81 (15.12)**
OECD member	4.40 (11.44)	8.58 (22.31)
Political will (parties)		
Left government	-0.61 (1.92)	-1.19 (3.75)
Green party	6.19 (3.70)	12.07 (7.22)
Political will (issue salience)		
GHG emissions (log tons)	0.27 (2.66)	0.51 (5.19)
Resource rents (% GDP)	8.36 (3.27)*	16.30 (6.36)*
Agricultural land (% area)	2.39 (5.43)	4.66 (10.60)
Armed conflict	-7.33 (6.19)	-14.30 (12.08)
Political will (peers)		
Language NAC	-8.07 (4.70)	-15.74 (9.17)
Contiguity NAC	-1.31 (3.36)	-2.56 (6.55)
Colonial NAC	3.10 (2.54)	6.04 (4.95)
Trade agreement NAC	2.18 (1.76)	4.25 (3.44)
Trade flow NAC	1.09 (1.72)	2.13 (3.36)
ρ_{t-1}	61.02 (3.70)***	
ρ_{t-2}	-12.28 (2.46)***	
Country FE	Yes	Yes
Year FE	Yes	Yes
N	3366	3366
AIC	2139	2139

*** $p < 0.001$; ** $p < 0.01$; * $p < 0.05$; $p < 0.1$. Coefficients and standard errors from dynamic panel models fitted on 250 imputations. [Arellano et al. \(1987\)](#)-type heteroskedasticity and serial correlation-robust standard errors

Table 5.B.2: Leadership model results (Robustness)

	OPM (bias-adjusted)		3-year lag		4-year lag		5-year lag	
	Short-run	Long-run	Short-run	Long-run	Short-run	Long-run	Short-run	Long-run
Int. NGOs	6.30 (2.11)**	19.43 (6.60)**	6.98 (2.23)**	14.68 (4.69)**	8.18 (2.27)**	16.52 (4.58)**	8.08 (2.38)**	15.70 (4.63)**
Int. NGO NAC	0.59 (1.24)	1.81 (3.85)	-0.09 (1.30)	-0.20 (2.73)	-0.48 (1.35)	-0.96 (2.73)	-0.99 (1.34)	-1.93 (2.60)
IDO (log \$)	-0.26 (1.07)	-0.80 (3.33)	1.55 (1.35)	3.27 (2.85)	1.80 (1.40)	3.63 (2.82)	2.14 (1.48)	4.15 (2.88)
IDO NAC	1.56 (1.13)	4.82 (3.50)	-0.65 (1.07)	-1.38 (2.25)	-0.96 (1.08)	-1.95 (2.19)	-1.01 (1.06)	-1.96 (2.06)
Multinationals (log \$)	-3.23 (3.04)	-9.96 (9.44)	0.31 (4.01)	0.65 (8.42)	-1.81 (4.29)	-3.65 (8.67)	-2.40 (4.22)	-4.67 (8.21)
Multinational NAC	1.65 (1.96)	5.08 (6.08)	-0.87 (2.19)	-1.82 (4.59)	-0.05 (2.26)	-0.09 (4.56)	-0.55 (2.32)	-1.07 (4.50)
Information								
Dom. NGOs (log #)	1.90 (1.66)	5.86 (5.09)	3.58 (1.92)	7.53 (4.02)	3.78 (1.95)	7.62 (3.93)	3.99 (2.00)*	7.75 (3.87)*
CSO consultation	2.48 (1.95)	7.64 (6.08)	2.33 (2.06)	4.90 (4.34)	1.30 (2.08)	2.63 (4.20)	1.80 (2.20)	3.50 (4.28)
Globalization	2.54 (4.83)	7.80 (14.89)	6.33 (7.70)	13.29 (16.18)	8.09 (8.43)	16.33 (17.01)	7.18 (9.12)	13.92 (17.71)
Resources/capacity								
GDP (\$/pc)	-5.65 (5.67)	-17.45 (17.70)	-3.28 (7.38)	-6.93 (15.54)	-5.17 (7.77)	-10.47 (15.72)	-7.42 (7.98)	-14.45 (15.54)
Env. ministry	0.94 (4.75)	2.91 (14.70)	1.67 (4.99)	3.52 (10.50)	0.33 (5.31)	0.68 (10.72)	0.99 (5.48)	1.94 (10.65)
Veto players	0.45 (1.15)	1.39 (3.56)	0.47 (0.96)	0.99 (2.01)	0.30 (0.88)	0.60 (1.77)	0.53 (0.93)	1.02 (1.81)
Political will (institutions)								
Electoral democracy	-1.22 (2.96)	-3.76 (9.18)	-1.56 (3.18)	-3.29 (6.69)	-0.44 (3.34)	-0.89 (6.75)	-1.36 (3.75)	-2.65 (7.27)
Federalism	-6.41 (5.51)	-19.71 (17.02)	-0.66 (5.99)	-1.39 (12.59)	-0.91 (6.09)	-1.82 (12.30)	-1.07 (6.17)	-2.07 (11.99)
EU member	14.30 (6.35)*	44.08 (19.42)*	17.03 (8.02)*	35.81 (16.87)*	4.80 (11.52)	9.68 (23.26)	7.62 (8.70)	14.79 (16.89)
OECD member	-1.76 (7.59)	-5.42 (23.53)	6.63 (8.90)	13.93 (18.72)	6.71 (9.09)	13.55 (18.34)	11.89 (7.99)	23.08 (15.53)
Political will (parties)								
Left government	0.65 (1.92)	2.01 (5.94)	-0.30 (1.91)	-0.62 (4.03)	-0.22 (2.00)	-0.44 (4.05)	-0.25 (2.09)	-0.49 (4.07)
Green party	0.78 (3.04)	2.40 (9.42)	4.03 (3.50)	8.47 (7.36)	3.91 (4.19)	7.89 (8.47)	3.36 (4.74)	6.52 (9.20)
Political will (issue salience)								
GHG emissions (log tons)	-0.04 (2.37)	-0.14 (7.33)	-0.24 (2.70)	-0.52 (5.67)	-0.48 (2.71)	-0.97 (5.46)	-0.61 (2.74)	-1.19 (5.32)
Resource rents (% GDP)	2.67 (2.75)	8.22 (8.52)	8.59 (3.37)*	18.06 (7.07)*	7.51 (3.66)*	15.16 (7.37)*	8.05 (3.85)*	15.63 (7.47)*
Agricultural land (% area)	1.84 (4.98)	5.66 (15.41)	1.65 (5.83)	3.47 (12.27)	-0.86 (5.58)	-1.74 (11.27)	-2.60 (6.08)	-5.04 (11.81)
Armed conflict	-7.40 (4.54)	-22.79 (14.11)	-9.11 (6.15)	-19.16 (12.93)	-10.81 (6.87)	-21.83 (13.87)	-10.05 (7.60)	-19.52 (14.77)
Political will (peers)								
Language NAC	-0.41 (2.50)	-1.25 (7.76)	-5.48 (4.01)	-11.52 (8.44)	-9.33 (4.79)	-18.84 (9.67)	-6.02 (4.28)	-11.69 (8.32)
Contiguity NAC	0.94 (2.27)	2.90 (7.04)	-0.13 (3.80)	-0.26 (7.99)	-0.11 (3.91)	-0.23 (7.89)	0.56 (4.45)	1.09 (8.65)
Colonial NAC	4.59 (1.88)*	14.16 (5.89)*	1.73 (2.48)	3.65 (5.22)	2.50 (2.56)	5.04 (5.17)	2.62 (2.65)	5.09 (5.14)
Trade agreement NAC	4.18 (1.57)**	12.87 (4.88)**	1.11 (1.83)	2.34 (3.85)	0.68 (2.26)	1.38 (4.56)	1.29 (2.31)	2.51 (4.50)
Trade flow NAC	3.27 (1.48)*	10.07 (4.64)*	1.53 (1.87)	3.22 (3.94)	0.59 (1.89)	1.19 (3.82)	0.15 (2.02)	0.29 (3.93)
σ^2	12.57 (0.32)***							
ρ_{-1}	67.53 (1.89)***		61.36 (3.87)***		62.31 (4.05)***		62.55 (4.23)***	
ρ_{-2}			-20.16 (2.55)***		-21.27 (2.69)***		-26.54 (3.00)***	
ρ_{-3}			11.24 (2.40)***		12.05 (2.82)***		13.77 (3.11)***	
ρ_{-4}					-2.62 (2.39)		-8.00 (2.76)**	
ρ_{-5}							6.72 (2.13)**	
Country FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
N	3553	3553	3179	3179	2992	2992	2805	2805
AIC	2584	2584	1853	1853	1687	1687	1492	1492

*** $p < 0.001$; ** $p < 0.01$; * $p < 0.05$; $p < 0.1$. Coefficients and standard errors from dynamic panel models fitted on 250 imputations. Arellano et al. (1987)-type heteroskedasticity and serial correlation-robust standard errors

Table 5.B.3: Leadership model results (Robustness cont.)

	First-difference	Non-linear		Broad lobbying measure	
	Short-run	Short-run	Long-run	Short-run	Long-run
Int. ENGOs	6.47 (2.66)*	9.53 (3.04)**	18.58 (5.93)**	7.19 (2.28)**	14.02 (4.44)**
Int. ENGOs ²		-1.77 (1.41)	-3.46 (2.75)		
Int. ENGO NAC	-1.21 (1.46)	-0.76 (1.51)	-1.49 (2.94)	0.32 (1.34)	0.62 (2.61)
IDO (log \$)	-0.79 (1.11)	0.36 (1.51)	0.69 (2.95)	1.49 (1.37)	2.90 (2.68)
IDO (log \$) ²		1.61 (1.15)	3.13 (2.25)		
IDO NAC	0.48 (0.77)	-0.41 (1.11)	-0.79 (2.16)	-0.49 (1.10)	-0.96 (2.14)
Multinationals (log \$)	-1.19 (4.48)	-2.43 (4.17)	-4.74 (8.13)		
Multinationals (log \$) ²		4.17 (2.86)	8.13 (5.57)		
Multinationals (log \$) (broad)				0.13 (4.50)	0.25 (8.77)
Multinational NAC	1.07 (3.17)	2.48 (3.13)	4.83 (6.10)		
Multinational NAC (broad)				-0.17 (2.41)	-0.33 (4.70)
Information					
Dom. ENGOs (log #)	0.36 (2.48)	4.10 (2.01)*	7.99 (3.92)*	4.08 (1.99)*	7.95 (3.88)*
CSO consultation	2.20 (2.19)	0.35 (2.09)	0.69 (4.08)	1.01 (2.02)	1.97 (3.94)
Globalization	-1.02 (11.62)	9.55 (7.46)	18.62 (14.54)	8.79 (7.43)	17.13 (14.48)
Resources/capacity					
GDP (\$/pc)	-5.36 (8.11)	-2.43 (7.14)	-4.76 (13.94)	-2.49 (7.12)	-4.88 (13.90)
Env. ministry	-0.08 (4.34)	0.52 (4.70)	1.01 (9.17)	0.16 (4.75)	0.32 (9.26)
Veto players	-0.31 (1.13)	0.94 (1.02)	1.83 (1.99)	0.87 (1.00)	1.69 (1.94)
Political will (institutions)					
Electoral democracy	-2.28 (3.45)	-0.19 (3.10)	-0.38 (6.05)	-0.02 (3.07)	-0.03 (5.99)
Federalism	0.14 (5.59)	-1.03 (5.86)	-2.00 (11.42)	-1.17 (5.85)	-2.28 (11.40)
EU member	26.09 (7.70)***	18.89 (7.80)*	36.83 (15.21)*	21.03 (7.74)**	40.98 (15.08)**
OECD member	22.32 (15.40)	5.44 (11.77)	10.61 (22.96)	4.53 (11.45)	8.82 (22.31)
Political will (parties)					
Left government	0.00 (2.00)	-0.64 (1.92)	-1.24 (3.75)	-0.60 (1.92)	-1.17 (3.74)
Green party	-6.98 (5.35)	6.22 (3.71)	12.13 (7.24)	6.23 (3.71)	12.13 (7.23)
Political will (issue salience)					
GHG emissions (log tons)	-1.08 (2.31)	0.28 (2.67)	0.54 (5.20)	0.30 (2.66)	0.58 (5.19)
Resource rents (% GDP)	1.79 (5.44)	8.20 (3.29)*	15.99 (6.40)*	8.33 (3.28)*	16.23 (6.38)*
Agricultural land (% area)	0.10 (5.56)	2.94 (5.48)	5.74 (10.68)	2.36 (5.42)	4.59 (10.56)
Armed conflict	1.29 (4.95)	-6.95 (6.20)	-13.55 (12.10)	-7.27 (6.19)	-14.17 (12.07)
Political will (peers)					
Language NAC	-12.15 (3.82)**	-8.41 (4.70)	-16.41 (9.18)	-8.06 (4.70)	-15.70 (9.17)
Contiguity NAC	2.11 (3.08)	-0.85 (3.37)	-1.65 (6.58)	-1.26 (3.36)	-2.45 (6.54)
Colonial NAC	4.42 (2.52)	3.02 (2.52)	5.88 (4.92)	3.07 (2.54)	5.99 (4.95)
Trade agreement NAC	1.58 (2.18)	1.90 (1.77)	3.71 (3.44)	2.13 (1.76)	4.16 (3.43)
Trade flow NAC	1.91 (2.03)	1.08 (1.72)	2.11 (3.35)	1.11 (1.73)	2.16 (3.37)
ρ_{t-1}		60.96 (3.70)***		60.99 (3.71)***	
ρ_{t-2}		-12.23 (2.46)***		-12.31 (2.46)***	
(Intercept)	2.59 (0.64)***				
Country FE	Yes	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes	Yes
N	3553	3366	3366	3366	3366
AIC	3236	2139	2139	2140	2140

*** $p < 0.001$; ** $p < 0.01$; * $p < 0.05$; \cdot $p < 0.1$. Coefficients and standard errors from dynamic panel models fitted on 250 imputations. Arellano et al. (1987)-type heteroskedasticity and serial correlation-robust standard errors

Table 5.B.4: Leadership model results (Robustness cont.)

	IDO project count		IDO and MNC presence	
	Short-run	Long-run	Short-run	Long-run
Int. ENGOs	7.57 (2.30)***	14.83 (4.50)***	7.57 (2.28)***	14.75 (4.46)***
Int. ENGO NAC	0.27 (1.36)	0.52 (2.67)	0.26 (1.36)	0.52 (2.64)
IDO (log count)			2.03 (2.14)	3.95 (4.18)
IDO (log projects)	0.60 (1.42)	1.17 (2.79)		
IDO NAC	-0.53 (1.07)	-1.03 (2.10)	-0.54 (1.08)	-1.06 (2.10)
Multinationals (log count)			6.84 (7.02)	13.34 (13.69)
Multinationals (log \$)	-1.23 (4.06)	-2.41 (7.95)		
Multinational NAC	-0.13 (2.31)	-0.26 (4.53)	-1.79 (2.11)	-3.49 (4.12)
Information				
Dom. ENGOs (log #)	4.51 (2.17)*	8.84 (4.25)*	4.18 (2.20)	8.15 (4.27)
CSO consultation	2.02 (2.37)	3.95 (4.65)	1.49 (2.28)	2.90 (4.45)
Globalization	9.96 (7.30)	19.50 (14.28)	9.73 (7.40)	18.95 (14.40)
Resources/capacity				
GDP (\$/pc)	-2.97 (6.79)	-5.84 (13.32)	-3.31 (6.78)	-6.47 (13.23)
Env. ministry	0.11 (4.93)	0.22 (9.66)	-0.07 (5.00)	-0.13 (9.75)
Veto players	0.93 (0.99)	1.82 (1.94)	0.88 (0.98)	1.72 (1.91)
Political will (institutions)				
Electoral democracy	-0.66 (3.09)	-1.30 (6.05)	-0.28 (3.01)	-0.56 (5.86)
Federalism	-0.87 (6.08)	-1.69 (11.91)	-0.79 (6.09)	-1.53 (11.87)
EU member	20.21 (7.65)**	39.58 (14.99)**	19.99 (7.84)*	38.95 (15.27)*
OECD member	5.31 (11.57)	10.41 (22.66)	5.71 (11.70)	11.13 (22.81)
Political will (parties)				
Left government	-0.56 (1.96)	-1.10 (3.84)	-0.53 (1.96)	-1.03 (3.82)
Green party	6.29 (3.78)	12.32 (7.40)	6.20 (3.86)	12.08 (7.52)
Political will (issue salience)				
GHG emissions (log tons)	2.49 (2.89)	4.88 (5.64)	2.51 (2.88)	4.89 (5.61)
Resource rents (% GDP)	4.43 (3.36)	8.68 (6.58)	4.50 (3.37)	8.76 (6.56)
Agricultural land (% area)	-1.03 (4.02)	-2.01 (7.87)	-1.23 (4.04)	-2.39 (7.88)
Armed conflict	-7.59 (6.26)	-14.88 (12.26)	-7.30 (6.22)	-14.22 (12.13)
Political will (peers)				
Language NAC	-8.22 (4.70)	-16.11 (9.22)	-8.16 (4.71)	-15.90 (9.19)
Contiguity NAC	-1.16 (3.32)	-2.27 (6.51)	-1.01 (3.32)	-1.97 (6.46)
Colonial NAC	3.02 (2.53)	5.92 (4.96)	2.97 (2.54)	5.80 (4.95)
Trade agreement NAC	2.32 (1.76)	4.55 (3.45)	2.20 (1.76)	4.29 (3.44)
Trade flow NAC	1.07 (1.75)	2.09 (3.42)	1.06 (1.77)	2.06 (3.45)
ρ_{t-1}	61.12 (3.70)***		60.99 (3.69)***	
ρ_{t-2}	-12.17 (2.46)***		-12.30 (2.45)***	
Country FE	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes
N	3366	3366	3366	3366
AIC	2150	2150	2146	2146

*** $p < 0.001$; ** $p < 0.01$; * $p < 0.05$; $\dot{p} < 0.1$. Coefficients and standard errors from dynamic panel models fitted on 250 imputations. Arellano et al. (1987)-type heteroskedasticity and serial correlation-robust standard errors

Appendix 5.C Innovation model results

Table 5.C.1: Innovation model results

	Main innovation model	
	Short-run	Long-run
Int. ENGOs	6.63 (3.31)*	12.80 (6.38)*
Int. ENGO NAC	-1.12 (1.93)	-2.16 (3.71)
IDO (log \$)	5.70 (1.93)**	11.00 (3.72)**
IDO NAC	-2.19 (2.33)	-4.22 (4.49)
Multinationals (log \$)	-3.21 (3.60)	-6.19 (6.94)
Multinational NAC	0.67 (2.97)	1.29 (5.73)
Information		
Dom. ENGOs (log #)	-1.71 (3.48)	-3.30 (6.72)
CSO consultation	1.49 (2.82)	2.87 (5.44)
Globalization	12.11 (7.91)	23.36 (15.25)
Resources/capacity		
GDP (\$/pc)	2.63 (5.30)	5.08 (10.22)
Env. ministry	6.62 (5.60)	12.76 (10.80)
Veto players	-1.79 (1.35)	-3.45 (2.60)
Political will (institutions)		
Electoral democracy	-0.63 (3.41)	-1.21 (6.58)
Federalism	-3.57 (8.82)	-6.88 (17.01)
EU member	49.65 (11.16)***	95.81 (21.54)***
OECD member	-25.01 (12.07)*	-48.27 (23.30)*
Political will (parties)		
Left government	1.07 (2.51)	2.07 (4.85)
Green party	7.53 (4.11)	14.53 (7.92)
Political will (issue salience)		
GHG emissions (log tons)	-1.68 (1.86)	-3.23 (3.58)
Resource rents (% GDP)	2.26 (3.46)	4.35 (6.69)
Agricultural land (% area)	7.70 (6.25)	14.86 (12.06)
Armed conflict	-3.00 (8.80)	-5.78 (16.99)
Political will (peers)		
Language NAC	2.22 (5.94)	4.29 (11.45)
Contiguity NAC	-1.66 (3.72)	-3.19 (7.19)
Colonial NAC	3.54 (3.10)	6.83 (5.98)
Trade agreement NAC	4.94 (2.59)	9.52 (4.99)
Trade flow NAC	0.11 (1.88)	0.21 (3.64)
ρ_{t-1}	81.76 (2.83)***	
ρ_{t-2}	-33.58 (3.11)***	
Country FE	Yes	Yes
Year FE	Yes	Yes
N	3366	3366
AIC	4361	4361

*** $p < 0.001$; ** $p < 0.01$; * $p < 0.05$; $p < 0.1$. Coefficients and standard errors from dynamic panel models fitted on 250 imputations. [Arellano et al. \(1987\)](#)-type heteroskedasticity and serial correlation-robust standard errors

Table 5.C.2: Innovation model results (Robustness)

	3-year lag			4-year lag			5-year lag		
	Short-run	Long-run	Short-run	Long-run	Short-run	Long-run	Short-run	Long-run	
Int. NGOs	5.67 (3.02)	21.09 (11.38)	4.31 (3.10)	10.31 (7.41)	7.75 (3.24)*	14.70 (6.14)*	4.76 (3.29)	10.31 (7.12)	
Int. NGO NAC	-1.18 (1.78)	-4.39 (6.69)	-1.21 (1.98)	-2.89 (4.73)	-1.66 (2.12)	-3.15 (4.03)	-1.73 (2.25)	-3.76 (4.87)	
IDO (log \$)	-1.23 (1.54)	-4.59 (5.78)	5.67 (1.80)**	13.54 (4.29)**	6.41 (1.78)**	12.16 (3.38)**	6.90 (1.79)**	14.95 (3.87)**	
IDO NAC	-1.15 (1.63)	-4.27 (6.10)	-2.60 (2.21)	-6.22 (2.29)	-3.61 (2.25)	-6.84 (4.26)	-3.26 (2.29)	-7.06 (4.96)	
Multinationals (log \$)	-6.68 (4.35)	-24.85 (16.28)	-1.84 (3.71)	-4.41 (8.86)	-5.32 (4.16)	-10.10 (7.90)	-5.71 (4.26)	-12.38 (9.24)	
Multinational NAC	3.22 (2.81)	11.97 (10.53)	0.66 (3.15)	1.59 (7.54)	1.56 (3.45)	2.96 (6.55)	1.94 (3.77)	4.19 (8.16)	
Information									
Dom. NGOs (log #)	-0.39 (2.60)	-1.47 (9.71)	-1.44 (3.29)	-3.45 (7.86)	-1.77 (3.34)	-3.36 (6.34)	-2.18 (3.31)	-4.72 (7.17)	
CSO consultation	2.66 (2.54)	9.88 (9.51)	2.22 (2.77)	5.30 (6.61)	1.78 (2.90)	3.38 (5.50)	2.84 (3.09)	6.15 (6.70)	
Globalization	-4.30 (6.09)	-15.99 (22.88)	8.67 (8.05)	20.71 (19.23)	7.98 (9.05)	15.13 (17.16)	6.77 (10.01)	14.67 (21.67)	
Resources/capacity									
GDP (\$/pc)	-3.50 (6.33)	-13.02 (23.73)	-1.45 (5.18)	-3.47 (12.38)	-2.01 (5.27)	-3.83 (10.00)	-5.36 (5.76)	-11.63 (12.48)	
Env. ministry	4.30 (5.67)	16.01 (21.24)	6.56 (5.51)	15.68 (13.16)	4.47 (5.21)	8.48 (9.88)	5.21 (5.63)	11.29 (12.20)	
Veto players	-1.84 (1.64)	-6.84 (6.15)	-1.28 (1.34)	-3.06 (3.20)	-1.04 (1.26)	-1.98 (2.38)	-0.26 (1.24)	-0.57 (2.69)	
Political will (institutions)									
Electoral democracy	-1.13 (3.75)	-4.19 (14.04)	-1.29 (3.56)	-3.09 (8.51)	-0.81 (3.67)	-1.54 (6.96)	-2.74 (4.05)	-5.93 (8.78)	
Federalism	-9.44 (7.62)	-35.06 (28.46)	-3.19 (8.58)	-7.61 (20.48)	-3.99 (8.56)	-7.57 (16.24)	-4.75 (8.68)	-10.27 (18.78)	
EU member	16.41 (9.10)	61.02 (33.58)	54.13 (11.89)**	129.35 (28.41)**	62.33 (15.87)**	118.29 (30.12)**	49.33 (15.13)**	106.87 (32.79)**	
OECD member	-18.20 (10.91)	-67.68 (40.70)	-27.79 (14.51)	-66.42 (34.68)	-29.82 (15.20)*	-56.59 (28.84)*	-24.60 (15.63)	-53.30 (33.85)	
Political will (parties)									
Left government	3.06 (2.57)	11.39 (9.65)	0.90 (2.54)	2.15 (6.06)	0.23 (2.60)	0.43 (4.93)	-0.55 (2.66)	-1.18 (5.77)	
Green party	2.78 (4.34)	10.34 (16.23)	4.56 (4.24)	10.89 (10.13)	4.43 (4.95)	8.40 (9.39)	2.54 (5.54)	5.49 (12.00)	
Political will (issue salience)									
GHG emissions (log tons)	-1.76 (2.46)	-6.55 (9.19)	-1.31 (1.64)	-3.12 (3.91)	-1.85 (1.69)	-3.52 (3.20)	-1.96 (1.64)	-4.24 (3.54)	
Resource rents (% GDP)	-1.99 (3.56)	-7.40 (13.32)	0.81 (3.50)	1.94 (8.36)	0.30 (3.54)	0.58 (6.73)	-1.13 (3.63)	-2.46 (7.86)	
Agricultural land (% area)	0.68 (6.81)	2.51 (25.48)	3.81 (6.22)	9.11 (14.87)	3.16 (6.55)	5.99 (12.43)	-2.63 (7.01)	-5.70 (15.19)	
Armed conflict	-3.70 (6.52)	-13.77 (24.38)	-6.77 (6.62)	-16.18 (15.82)	-8.01 (7.53)	-15.20 (14.29)	-6.78 (6.42)	-14.69 (13.91)	
Political will (peers)									
Language NAC	3.43 (3.58)	12.76 (13.41)	2.31 (5.74)	5.52 (13.72)	3.13 (6.44)	5.95 (12.22)	1.03 (6.24)	2.22 (13.51)	
Contiguity NAC	-0.60 (3.26)	-2.21 (12.19)	-1.09 (3.65)	-2.60 (8.72)	-0.66 (3.98)	-1.25 (7.55)	-2.37 (4.02)	-5.13 (8.70)	
Colonial NAC	6.67 (2.70)*	24.79 (10.24)*	4.38 (3.49)	10.46 (8.33)	4.58 (2.94)	8.69 (5.59)	5.54 (2.79)*	12.01 (6.03)*	
Trade agreement NAC	4.72 (2.24)*	17.57 (8.43)*	3.82 (2.75)	9.14 (6.56)	3.09 (2.64)	5.87 (5.02)	3.02 (2.94)	6.54 (6.36)	
Trade flow NAC	0.32 (2.12)	1.17 (7.95)	1.34 (1.93)	3.20 (4.62)	0.68 (1.93)	1.29 (3.66)	2.70 (2.00)	5.84 (4.34)	
σ^2	25.99 (0.66)**								
ρ_{t-1}	73.10 (1.72)**		88.65 (3.23)**		90.68 (3.29)**		91.63 (3.33)**		
ρ_{t-2}			-53.44 (3.47)**		-62.94 (2.90)**		-68.81 (2.86)**		
ρ_{t-3}			22.94 (3.56)**		36.36 (4.30)**		45.84 (5.36)**		
ρ_{t-4}					-16.79 (3.32)**		-29.40 (4.87)**		
ρ_{t-5}							14.58 (2.86)**		
Country FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	
Year FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	
N	3553	3553	3179	3179	2992	2992	2805	2805	
AIC	5107	5107	3980	3980	3634	3634	3257	3257	

*** $p < 0.001$; ** $p < 0.01$; * $p < 0.05$; $p < 0.1$. Coefficients and standard errors from dynamic panel models fitted on 250 imputations. Arellano et al. (1987)-type heteroskedasticity and serial correlation-robust standard errors

Table 5.C.3: Innovation model results (Robustness cont.)

	First-difference	Non-linear		Broad lobbying measure	
	Short-run	Short-run	Long-run	Short-run	Long-run
Int. ENGOs	7.05 (3.82)	7.99 (4.55)	15.43 (8.79)	6.74 (3.30)*	13.01 (6.38)*
Int. ENGOs ²		-1.23 (2.75)	-2.38 (5.31)		
Int. ENGO NAC	-0.53 (1.92)	-1.82 (2.58)	-3.52 (4.98)	-1.11 (1.96)	-2.14 (3.77)
IDO (log \$)	-0.50 (1.19)	6.07 (2.22)**	11.72 (4.28)**	5.76 (1.93)**	11.11 (3.73)**
IDO (log \$) ²		-0.54 (1.59)	-1.04 (3.08)		
IDO NAC	0.64 (2.03)	-2.14 (2.36)	-4.13 (4.56)	-2.18 (2.33)	-4.20 (4.50)
Multinationals (log \$)	2.51 (4.03)	-2.76 (3.94)	-5.32 (7.60)		
Multinationals (log \$) ²		-2.88 (4.55)	-5.56 (8.79)		
Multinationals (log \$) (broad)				-1.82 (3.67)	-3.51 (7.09)
Multinational NAC	-0.74 (2.64)	-1.05 (4.84)	-2.02 (9.35)		
Multinational NAC (broad)				-0.75 (2.97)	-1.45 (5.73)
Information					
Dom. ENGOs (log #)	-3.45 (5.37)	-1.86 (3.50)	-3.59 (6.75)	-1.76 (3.49)	-3.40 (6.72)
CSO consultation	4.52 (1.87)*	1.68 (3.03)	3.25 (5.85)	1.50 (2.82)	2.90 (5.43)
Globalization	9.11 (9.81)	11.67 (8.04)	22.53 (15.52)	12.13 (7.89)	23.41 (15.21)
Resources/capacity					
GDP (\$/pc)	-2.81 (4.42)	2.39 (5.29)	4.61 (10.21)	2.82 (5.31)	5.44 (10.25)
Env. ministry	0.20 (3.15)	6.53 (5.60)	12.60 (10.81)	6.71 (5.63)	12.95 (10.85)
Veto players	-1.32 (1.91)	-1.74 (1.35)	-3.37 (2.60)	-1.77 (1.34)	-3.41 (2.59)
Political will (institutions)					
Electoral democracy	-1.35 (2.77)	-0.48 (3.44)	-0.93 (6.64)	-0.60 (3.41)	-1.16 (6.58)
Federalism	-3.20 (7.54)	-3.59 (8.88)	-6.93 (17.14)	-3.53 (8.81)	-6.81 (17.00)
EU member	139.78 (24.72)***	50.20 (11.19)***	96.92 (21.61)***	49.51 (11.14)***	95.54 (21.50)***
OECD member	-1.79 (39.23)	-24.32 (12.14)*	-46.96 (23.43)*	-25.17 (12.10)*	-48.57 (23.36)*
Political will (parties)					
Left government	1.45 (2.20)	1.05 (2.51)	2.02 (4.86)	1.04 (2.51)	2.02 (4.85)
Green party	-3.53 (6.36)	7.57 (4.14)	14.61 (7.99)	7.65 (4.13)	14.76 (7.96)
Political will (issue salience)					
GHG emissions (log tons)	-1.14 (1.76)	-1.65 (1.85)	-3.19 (3.58)	-1.67 (1.86)	-3.22 (3.59)
Resource rents (% GDP)	3.30 (4.17)	2.27 (3.48)	4.38 (6.71)	2.28 (3.47)	4.39 (6.69)
Agricultural land (% area)	2.48 (5.96)	7.70 (6.23)	14.86 (12.03)	7.63 (6.27)	14.71 (12.09)
Armed conflict	15.40 (10.81)	-3.00 (8.82)	-5.79 (17.03)	-3.06 (8.81)	-5.90 (17.00)
Political will (peers)					
Language NAC	-3.38 (5.39)	2.24 (5.93)	4.33 (11.45)	2.13 (5.94)	4.12 (11.47)
Contiguity NAC	-2.05 (3.77)	-1.71 (3.66)	-3.29 (7.07)	-1.63 (3.73)	-3.14 (7.19)
Colonial NAC	7.63 (3.08)*	3.44 (3.09)	6.64 (5.96)	3.51 (3.09)	6.78 (5.97)
Trade agreement NAC	0.25 (2.61)	5.10 (2.65)	9.85 (5.11)	4.94 (2.57)	9.52 (4.95)
Trade flow NAC	-2.27 (2.32)	0.16 (1.88)	0.30 (3.62)	0.07 (1.89)	0.14 (3.64)
ρ_{t-1}		81.80 (2.83)***		81.76 (2.83)***	
ρ_{t-2}		-33.60 (3.12)***		-33.59 (3.11)***	
(Intercept)	0.57 (0.65)				
Country FE	Yes	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes	Yes
N	3553	3366	3366	3366	3366
AIC	5787	4366	4366	4361	4361

*** $p < 0.001$; ** $p < 0.01$; * $p < 0.05$; $p < 0.1$. Coefficients and standard errors from dynamic panel models fitted on 250 imputations. Arellano et al. (1987)-type heteroskedasticity and serial correlation-robust standard errors

Appendix 5.D Influence model results

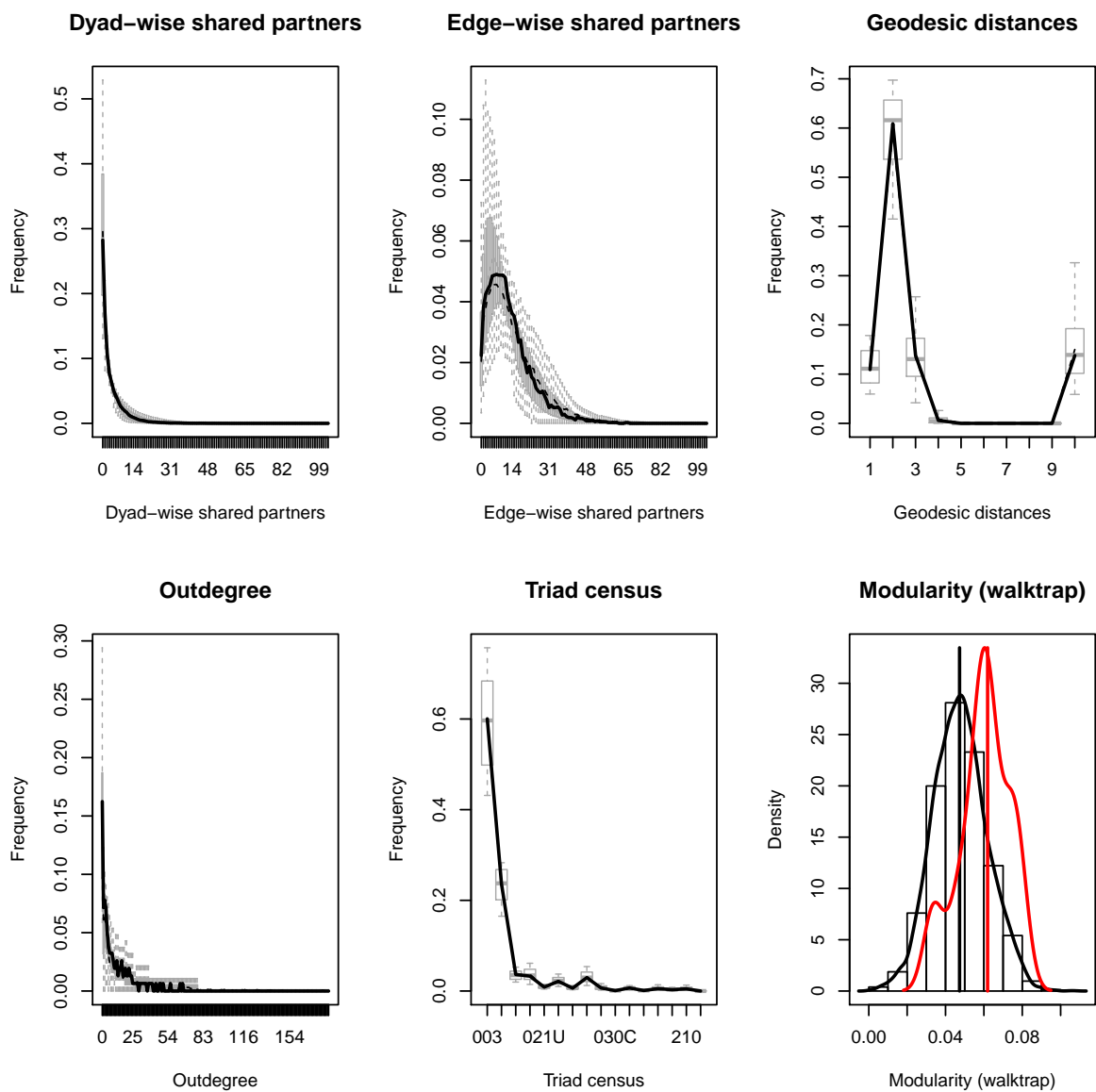


Figure 5.D.1: Goodness-of-fit statistics for main bootstrapped TERGM model

Table 5.D.1: Influence model results

	Main model
Shared int. ENGOS	0.03 [0.00; 0.07]
Env. ODA sent by IDO (log \$)	-0.02 [-0.04; -0.01]
Shared multinationals	0.15 [0.12; 0.18]
Int. ENGOS	-0.00 [-0.04; 0.04]
IDO (log \$)	-0.01 [-0.05; -0.00]
Multinationals (log \$)	-0.02 [-0.07; 0.03]
Exogenous (nodal)	
Dom. ENGOS (log #)	0.04 [0.02; 0.07]
CSO consultation	0.00 [-0.05; 0.06]
Globalization	0.32 [0.23; 0.43]
GDP (\$/pc)	0.12 [-0.02; 0.28]
Env. ministry	-0.12 [-0.15; -0.08]
Veto players	-0.03 [-0.06; 0.00]
Electoral democracy	0.00 [-0.07; 0.08]
Left government	-0.02 [-0.04; -0.00]
Green party	0.04 [0.00; 0.07]
GHG emissions (log tons)	0.01 [-0.04; 0.07]
Resource rents (% GDP)	-0.06 [-0.14; 0.01]
Agricultural land (% area)	0.00 [-0.03; 0.34]
Armed conflict	0.02 [0.00; 0.03]
Exogenous (dyadic)	
Common language	0.23 [0.16; 0.29]
Contiguous	0.19 [0.09; 0.28]
Colonial relationship	0.07 [-0.07; 0.24]
Free trade agreement	0.18 [0.14; 0.23]
Trade flows (log \$)	0.07 [0.04; 0.11]
Endogenous	
# Reciprocal edges	0.06 [-0.04; 0.15]
Geom-wt. edge. shared partners	0.05 [-0.04; 0.13]
Geom-wt. out-degree	-0.96 [-1.17; -0.58]
Cyclic triples	-0.00 [-0.01; 0.00]
Stability	2.53 [2.43; 2.67]
Time trend	0.02 [0.01; 0.03]
Delayed reciprocity	0.01 [-0.08; 0.13]
# Edges	-0.67 [-1.40; -0.29]
Country FE	Yes
N(countries)	187
N(possible edges)	660858

Bold text indicates that 0 is outside of the 95% credible interval. Estimates are log-odds from a temporal exponential random graph model with bootstrapped pseudolikelihood methods. 500 bootstrap replications.

Table 5.D.2: Influence model results (robustness, only developed-developing dyads)

	Restricted model (bipartite)
Shared int. ENGOS	0.06 [−0.01; 0.13]
Env. ODA sent by IDO (log \$)	−0.00 [−0.04; 0.03]
Shared multinationals	−0.03 [−0.12; 0.06]
Int. ENGOS	−0.05 [−0.13; 0.04]
IDO (log \$)	−0.01 [−0.05; 0.03]
Multinationals (log \$)	0.06 [−0.06; 0.18]
Exogenous (nodal)	
Dom. ENGOS (log #)	0.00 [−0.06; 0.06]
CSO consultation	0.07 [−0.05; 0.19]
Globalization	0.27 [0.13; 0.43]
GDP (\$/pc)	0.11 [−0.17; 0.38]
Env. ministry	−0.01 [−0.09; 0.10]
Veto players	0.00 [−0.05; 0.06]
Electoral democracy	−0.13 [−0.28; −0.01]
Left government	−0.01 [−0.04; 0.01]
Green party	−0.03 [−0.10; 0.05]
GHG emissions (log tons)	0.08 [−0.01; 0.21]
Resource rents (% GDP)	−0.12 [−0.25; −0.05]
Agricultural land (% area)	−0.01 [−0.05; 0.40]
Armed conflict	−0.00 [−0.03; 0.05]
Exogenous (dyadic)	
Common language	0.17 [0.07; 0.26]
Contiguous	−0.05 [−0.54; 0.39]
Colonial relationship	0.18 [−0.06; 0.45]
Free trade agreement	0.17 [0.09; 0.27]
Trade flows (log \$)	0.11 [0.01; 0.22]
Endogenous	
Geom-wt. dyad shared partners (funders)	−0.12 [−0.19; −0.05]
Geom-wt. dyad shared partners (recipients)	0.00 [−0.01; 0.01]
Geom-wt. degree (funders)	0.13 [−0.17; 0.58]
Geom-wt. degree (recipients)	0.78 [0.25; 1.53]
Stability	2.38 [2.30; 2.52]
Time trend	0.03 [0.01; 0.04]
Country FE	Yes
N(funders)	39
N(recipients)	148
N(possible edges)	109668

Bold text indicates that 0 is outside of the 95% credible interval. Estimates are log-odds from a temporal exponential random graph model with bootstrapped pseudolikelihood methods. 500 bootstrap replications. Restricted to influence relationships between ODA funders and ODA recipients, network formulated as bipartite network with undirected ties.

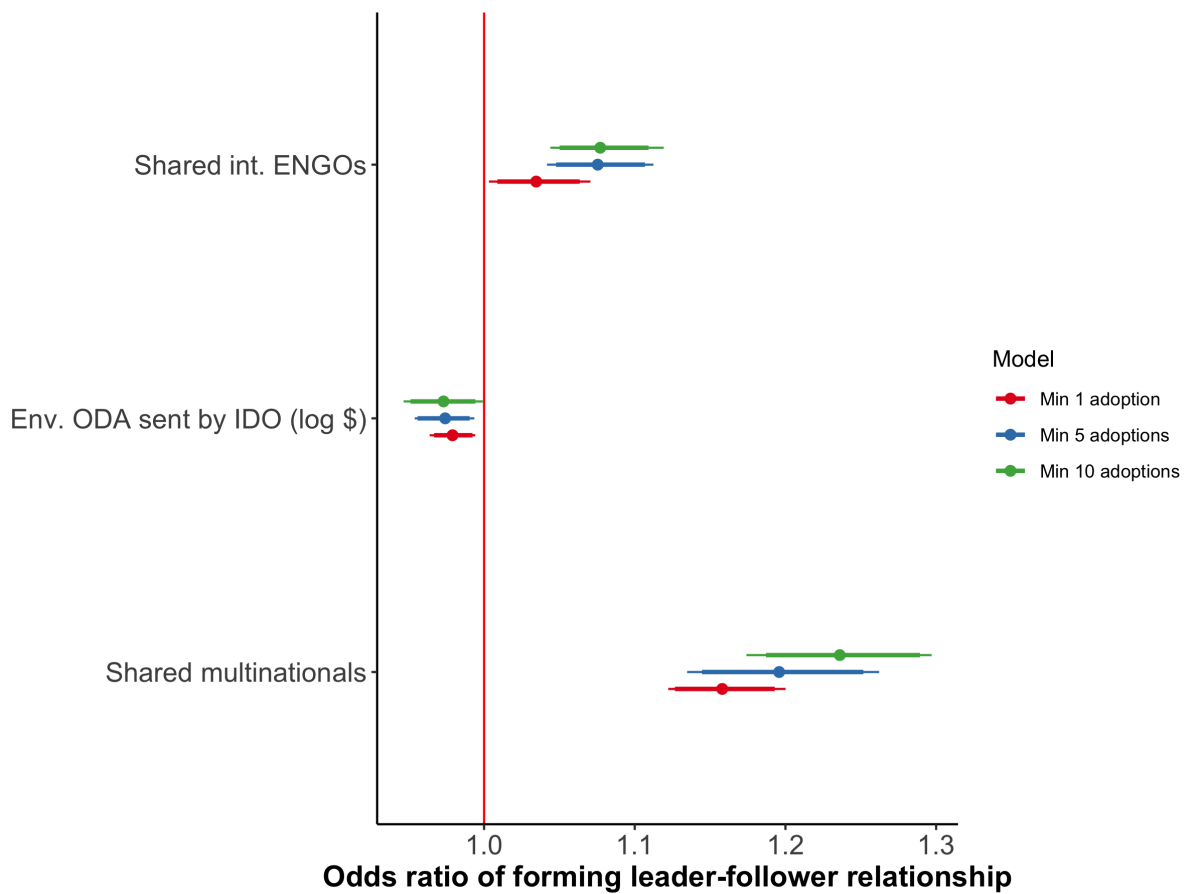


Figure 5.D.2: Varying the minimum number of adoptions for a policy to be included in the analysis.

Model estimates for transnational advocacy by large international environmental NGOs, international development organizations, and multinational corporations (DV: Environmental policy influence). Coefficients and confidence intervals (90% and 95%) from a TERGM with 500 bootstrap replicates.

Table 5.D.3: Influence model results (robustness, minimum adoptions)

	Main (Min 1 adoption)	Min 5 adoptions	Min 10 adoptions
Shared int. ENGOS	0.03 [0.00; 0.07]	0.07 [0.04; 0.11]	0.07 [0.04; 0.11]
Env. ODA sent by IDO (log \$)	-0.02 [-0.04; -0.01]	-0.03 [-0.05; -0.01]	-0.03 [-0.06; -0.00]
Shared multinationals	0.15 [0.12; 0.18]	0.18 [0.13; 0.23]	0.21 [0.16; 0.26]
Int. ENGOS	-0.00 [-0.04; 0.04]	0.04 [-0.03; 0.12]	0.03 [-0.04; 0.10]
IDO (log \$)	-0.01 [-0.05; -0.00]	-0.02 [-0.07; -0.01]	-0.01 [-0.08; 0.01]
Multinationals (log \$)	-0.02 [-0.07; 0.03]	-0.03 [-0.09; 0.03]	-0.03 [-0.08; 0.03]
Exogenous (nodal)			
Dom. ENGOS (log #)	0.04 [0.02; 0.07]	0.03 [0.01; 0.06]	0.03 [-0.01; 0.07]
CSO consultation	0.00 [-0.05; 0.06]	-0.00 [-0.07; 0.05]	-0.02 [-0.07; 0.05]
Globalization	0.32 [0.23; 0.43]	0.48 [0.36; 0.60]	0.47 [0.36; 0.59]
GDP (\$/pc)	0.12 [-0.02; 0.28]	0.23 [0.10; 0.36]	0.23 [0.11; 0.34]
Env. ministry	-0.12 [-0.15; -0.08]	-0.10 [-0.16; -0.04]	-0.10 [-0.16; -0.05]
Veto players	-0.03 [-0.06; 0.00]	-0.03 [-0.06; -0.00]	-0.02 [-0.06; 0.02]
Electoral democracy	0.00 [-0.07; 0.08]	-0.02 [-0.11; 0.08]	0.00 [-0.09; 0.09]
Left government	-0.02 [-0.04; -0.00]	-0.02 [-0.03; 0.01]	-0.02 [-0.04; 0.00]
Green party	0.04 [0.00; 0.07]	0.05 [0.00; 0.10]	0.05 [0.00; 0.09]
GHG emissions (log tons)	0.01 [-0.04; 0.07]	0.06 [0.02; 0.10]	0.05 [0.00; 0.09]
Resource rents (% GDP)	-0.06 [-0.14; 0.01]	-0.13 [-0.22; -0.06]	-0.10 [-0.20; -0.03]
Agricultural land (% area)	0.00 [-0.03; 0.34]	0.03 [-0.00; 0.44]	0.06 [0.02; 0.47]
Armed conflict	0.02 [0.00; 0.03]	0.02 [-0.00; 0.03]	0.01 [-0.00; 0.03]
Exogenous (dyadic)			
Common language	0.23 [0.16; 0.29]	0.19 [0.12; 0.25]	0.20 [0.12; 0.28]
Contiguous	0.19 [0.09; 0.28]	0.26 [0.17; 0.34]	0.25 [0.15; 0.33]
Colonial relationship	0.07 [-0.07; 0.24]	0.04 [-0.13; 0.25]	0.04 [-0.18; 0.25]
Free trade agreement	0.18 [0.14; 0.23]	0.23 [0.16; 0.28]	0.21 [0.15; 0.30]
Trade flows (log \$)	0.07 [0.04; 0.11]	0.08 [0.03; 0.12]	0.09 [0.04; 0.14]
Endogenous			
# Reciprocal edges	0.06 [-0.04; 0.15]	-0.02 [-0.22; 0.11]	0.00 [-0.19; 0.19]
Geom-wt. edge. shared partners	0.05 [-0.04; 0.13]	-0.02 [-0.09; 0.04]	0.07 [-0.01; 0.13]
Geom-wt. out-degree	-0.96 [-1.17; -0.58]	-0.59 [-0.88; -0.13]	-0.46 [-0.75; -0.02]
Cyclic triples	-0.00 [-0.01; 0.00]	-0.01 [-0.02; -0.00]	-0.01 [-0.02; -0.00]
Stability	2.53 [2.43; 2.67]	2.74 [2.67; 2.87]	2.75 [2.69; 2.86]
Time trend	0.02 [0.01; 0.03]	-0.01 [-0.01; 0.00]	-0.01 [-0.02; 0.01]
Delayed reciprocity	0.01 [-0.08; 0.13]	0.13 [0.02; 0.29]	0.08 [-0.13; 0.31]
# Edges	-0.67 [-1.40; -0.29]	-0.47 [-1.31; 0.04]	-0.30 [-1.26; 0.34]
Country FE	Yes	Yes	Yes
N(countries)	187	187	187
N(possible edges)	660858	660858	660858

Bold text indicates that 0 is outside of the 95% credible interval. Estimates are log-odds from a temporal exponential random graph model with bootstrapped pseudolikelihood methods. 500 bootstrap replications. Models vary in the minimum number of adoptions for a policy to be included in the analysis.

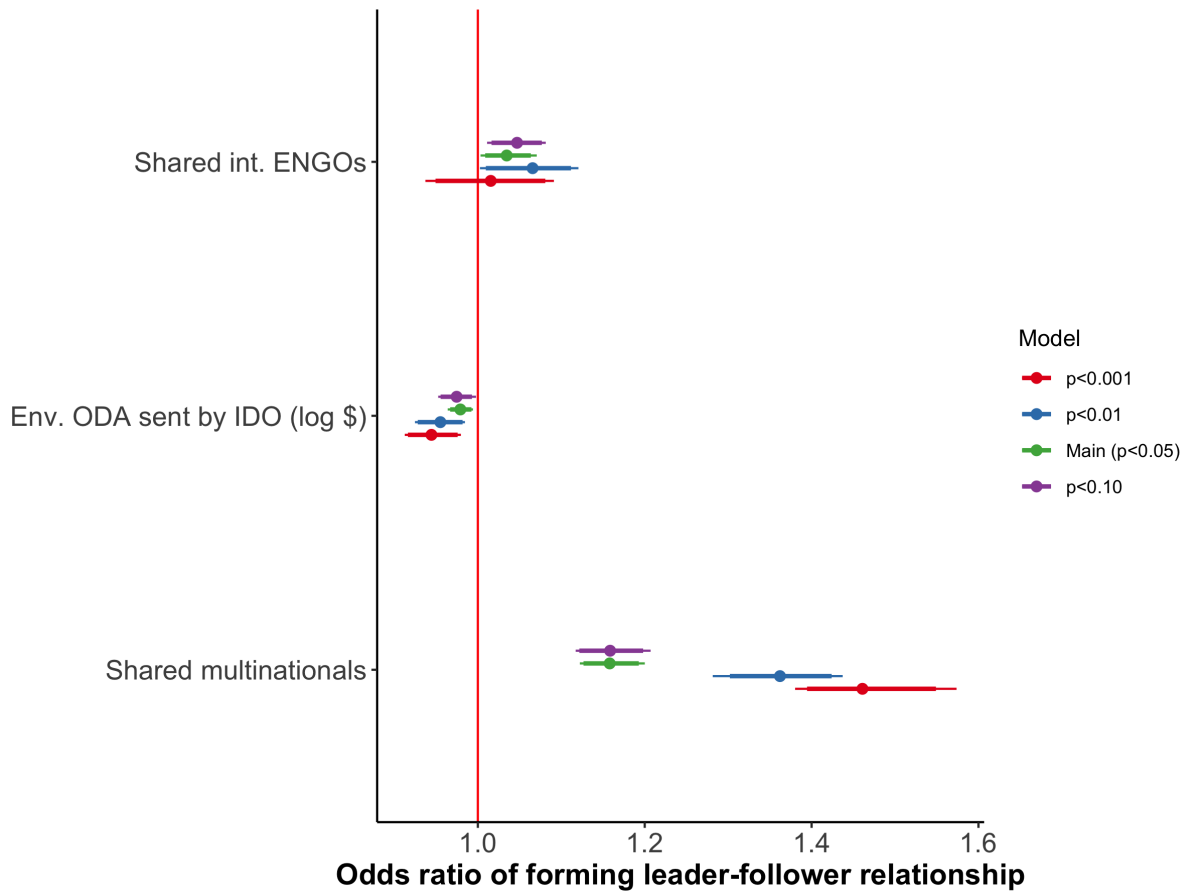


Figure 5.D.3: Varying by p-value threshold for adding edges to leader-follower network. Model estimates for transnational advocacy by large international environmental NGOs, international development organizations, and multinational corporations (DV: Environmental policy influence). Coefficients and confidence intervals (90% and 95%) from a TERGM with 500 bootstrap replicates.

Table 5.D.4: Influence model results (robustness, p-value thresholds)

	Edges if $p < 0.001$	Edges if $p < 0.01$	Main (Edges if $p < 0.05$)	Edges if $p < 0.10$
Shared int. ENGOs	0.02 [-0.07; 0.09]	0.06 [0.00; 0.11]	0.03 [0.00; 0.07]	0.05 [0.01; 0.08]
Env. ODA sent by IDO (log \$)	-0.06 [-0.09; -0.02]	-0.05 [-0.08; -0.01]	-0.02 [-0.04; -0.01]	-0.03 [-0.05; -0.00]
Shared multinationals	0.38 [0.32; 0.46]	0.31 [0.25; 0.36]	0.15 [0.12; 0.18]	0.15 [0.11; 0.19]
Int. ENGOs	0.19 [0.05; 0.29]	0.10 [0.01; 0.20]	-0.00 [-0.04; 0.04]	0.03 [-0.01; 0.07]
IDO (log \$)	-0.01 [-0.14; 0.04]	0.01 [-0.09; 0.02]	-0.01 [-0.05; -0.00]	-0.01 [-0.05; 0.01]
Multinationals (log \$)	-0.08 [-0.18; 0.06]	-0.06 [-0.10; 0.01]	-0.02 [-0.07; 0.03]	0.01 [-0.03; 0.06]
Exogenous (nodal)				
Dom. ENGOs (log #)	0.08 [0.00; 0.17]	0.08 [0.05; 0.12]	0.04 [0.02; 0.07]	0.03 [0.00; 0.06]
CSO consultation	-0.06 [-0.16; 0.07]	-0.02 [-0.10; 0.08]	0.00 [-0.05; 0.06]	-0.01 [-0.08; 0.05]
Globalization	0.76 [0.59; 1.02]	0.68 [0.54; 0.83]	0.32 [0.23; 0.43]	0.39 [0.27; 0.53]
GDP (\$/pc)	1.15 [0.69; 1.50]	0.45 [0.26; 0.65]	0.12 [-0.02; 0.28]	0.09 [-0.06; 0.22]
Env. ministry	-0.32 [-0.48; -0.18]	-0.20 [-0.32; -0.11]	-0.12 [-0.15; -0.08]	-0.11 [-0.16; -0.07]
Veto players	0.02 [-0.07; 0.08]	0.01 [-0.03; 0.06]	-0.03 [-0.06; 0.00]	-0.01 [-0.05; 0.02]
Electoral democracy	-0.12 [-0.30; 0.07]	-0.05 [-0.19; 0.09]	0.00 [-0.07; 0.08]	0.01 [-0.07; 0.09]
Left government	0.01 [-0.02; 0.06]	0.02 [-0.01; 0.05]	-0.02 [-0.04; -0.00]	-0.01 [-0.04; 0.01]
Green party	0.00 [-0.07; 0.07]	0.03 [-0.02; 0.08]	0.04 [0.00; 0.07]	0.03 [-0.00; 0.06]
GHG emissions (log tons)	0.07 [-0.02; 0.17]	0.05 [0.00; 0.11]	0.01 [-0.04; 0.07]	0.01 [-0.05; 0.07]
Resource rents (% GDP)	-0.18 [-0.39; -0.07]	-0.13 [-0.20; -0.07]	-0.06 [-0.14; 0.01]	-0.09 [-0.14; -0.04]
Agricultural land (% area)	0.10 [-0.00; 1.09]	0.14 [0.09; 0.74]	0.00 [-0.03; 0.34]	0.01 [-0.02; 0.42]
Armed conflict	0.05 [0.02; 0.09]	0.01 [-0.01; 0.03]	0.02 [0.00; 0.03]	0.02 [0.00; 0.03]
Exogenous (dyadic)				
Common language	0.42 [0.25; 0.60]	0.28 [0.17; 0.39]	0.23 [0.16; 0.29]	0.22 [0.16; 0.27]
Contiguous	0.22 [-0.04; 0.49]	0.12 [-0.16; 0.36]	0.19 [0.09; 0.28]	0.21 [0.08; 0.33]
Colonial relationship	0.09 [-0.11; 0.28]	0.14 [-0.10; 0.40]	0.07 [-0.07; 0.24]	-0.01 [-0.15; 0.14]
Free trade agreement	0.37 [0.27; 0.48]	0.37 [0.28; 0.46]	0.18 [0.14; 0.23]	0.18 [0.12; 0.26]
Trade flows (log \$)	0.32 [0.22; 0.44]	0.19 [0.13; 0.25]	0.07 [0.04; 0.11]	0.07 [0.03; 0.10]
Endogenous				
# Reciprocal edges	0.01 [-0.44; 0.43]	-0.13 [-0.55; 0.30]	0.06 [-0.04; 0.15]	0.00 [-0.17; 0.16]
Geom-wt. edge. shared partners	-0.15 [-0.23; -0.06]	-0.08 [-0.16; -0.01]	0.05 [-0.04; 0.13]	-0.04 [-0.10; 0.01]
Geom-wt. out-degree	-0.46 [-0.78; 0.01]	-0.27 [-0.54; 0.18]	-0.96 [-1.17; -0.58]	-0.63 [-0.87; -0.28]
Cyclic triples	-0.04 [-0.08; -0.00]	-0.02 [-0.04; -0.00]	-0.00 [-0.01; 0.00]	-0.00 [-0.01; 0.00]
Stability	2.69 [2.64; 2.79]	2.73 [2.66; 2.84]	2.53 [2.43; 2.67]	2.78 [2.70; 2.90]
Time trend	-0.00 [-0.02; 0.02]	-0.00 [-0.01; 0.01]	0.02 [0.01; 0.03]	-0.00 [-0.01; 0.01]
Delayed reciprocity	0.03 [-0.34; 0.38]	0.23 [-0.08; 0.56]	0.01 [-0.08; 0.13]	0.08 [-0.05; 0.21]
# Edges	-15.63 [-18.31; -14.31]	-0.63 [-2.66; 0.38]	-0.67 [-1.40; -0.29]	-0.39 [-1.34; 0.20]
Country FE	Yes	Yes	Yes	Yes
N(countries)	187	187	187	187
N(possible edges)	660858	660858	660858	660858

Bold text indicates that 0 is outside of the 95% credible interval. Estimates are log-odds from a temporal exponential random graph model with bootstrapped pseudolikelihood methods. 500 bootstrap replications. Models vary in the maximum p-value allowed for adding edges to the leader-follower network.

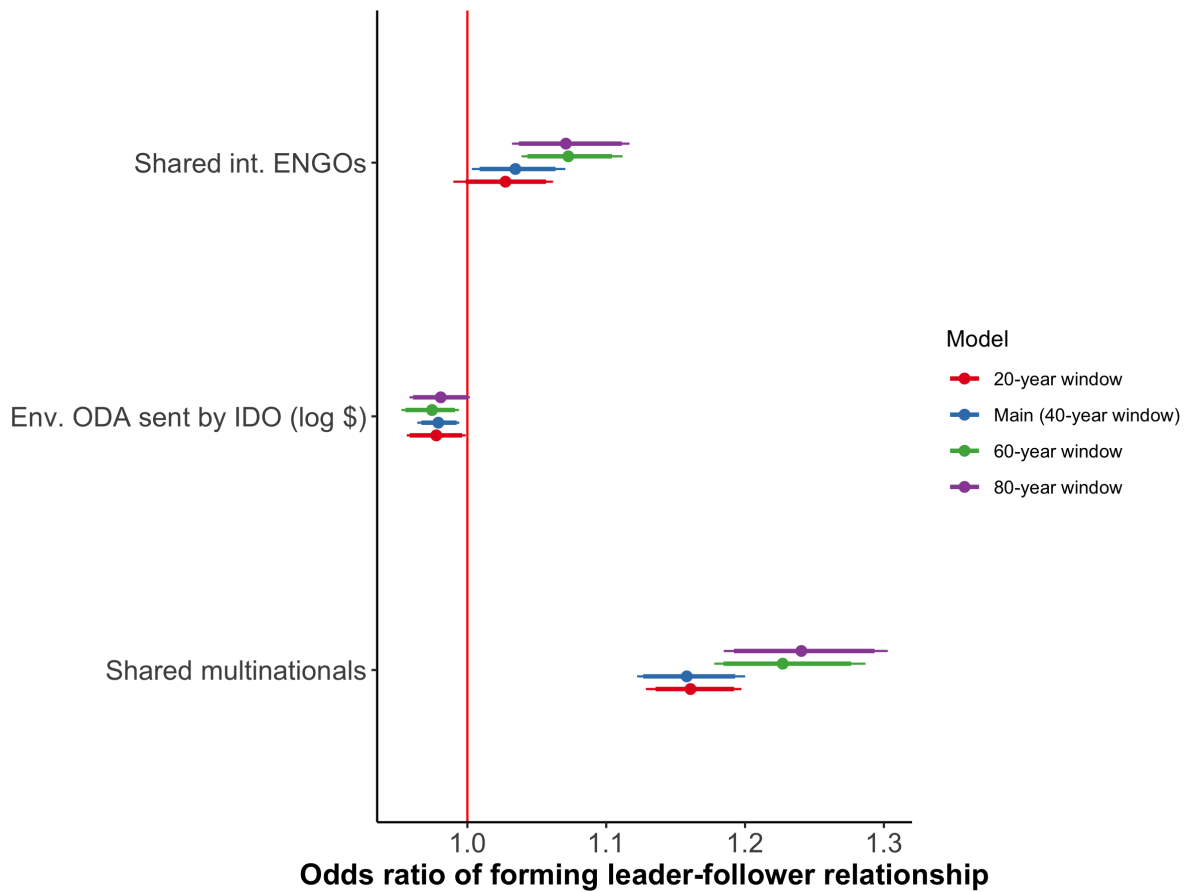


Figure 5.D.4: Varying by length of rolling window for inferring leader-follower relationships.

Model estimates for transnational advocacy by large international environmental NGOs, international development organizations, and multinational corporations (DV: Environmental policy influence). Coefficients and confidence intervals (90% and 95%) from a TERGM with 500 bootstrap replicates.

Table 5.D.5: Influence model results (robustness, window size)

	20-year window	Main (40-year window)	60-year window	80-year window
Shared int. NGOs	0.03 [-0.01; 0.06]	0.03 [0.00; 0.07]	0.07 [0.04; 0.11]	0.07 [0.03; 0.11]
Env. ODA sent by IDO (log \$)	-0.02 [-0.05; -0.00]	-0.02 [-0.04; -0.01]	-0.03 [-0.05; -0.01]	-0.02 [-0.04; 0.00]
Shared multinationals	0.15 [0.12; 0.18]	0.15 [0.12; 0.18]	0.20 [0.16; 0.25]	0.22 [0.17; 0.26]
Int. NGOs	0.03 [-0.01; 0.08]	-0.00 [-0.04; 0.04]	0.03 [-0.05; 0.10]	0.04 [-0.03; 0.12]
IDO (log \$)	0.00 [-0.04; 0.03]	-0.01 [-0.05; -0.00]	-0.02 [-0.05; -0.00]	-0.02 [-0.05; 0.00]
Multinationals (log \$)	-0.02 [-0.07; 0.02]	-0.02 [-0.07; 0.03]	-0.01 [-0.08; 0.04]	-0.02 [-0.07; 0.04]
Exogenous (nodal)				
Dom. NGOs (log #)	0.08 [0.04; 0.12]	0.04 [0.02; 0.07]	0.03 [-0.01; 0.06]	0.02 [-0.01; 0.05]
CSO consultation	0.01 [-0.06; 0.09]	0.00 [-0.05; 0.06]	0.01 [-0.06; 0.08]	0.02 [-0.05; 0.09]
Globalization	0.39 [0.23; 0.59]	0.32 [0.23; 0.43]	0.47 [0.38; 0.57]	0.46 [0.36; 0.58]
GDP (\$/pc)	0.36 [0.22; 0.48]	0.12 [-0.02; 0.28]	0.17 [0.02; 0.34]	0.19 [0.03; 0.34]
Env. ministry	-0.22 [-0.28; -0.14]	-0.12 [-0.15; -0.08]	-0.10 [-0.19; -0.02]	-0.08 [-0.17; 0.01]
Veto players	-0.03 [-0.08; 0.01]	-0.03 [-0.06; 0.00]	-0.02 [-0.04; 0.01]	-0.02 [-0.05; 0.02]
Electoral democracy	-0.01 [-0.10; 0.08]	0.00 [-0.07; 0.08]	-0.01 [-0.12; 0.08]	-0.03 [-0.13; 0.07]
Left government	-0.01 [-0.04; 0.02]	-0.02 [-0.04; -0.00]	-0.01 [-0.03; 0.01]	-0.01 [-0.03; 0.01]
Green party	0.03 [0.00; 0.07]	0.04 [0.00; 0.07]	0.07 [0.05; 0.11]	0.08 [0.04; 0.11]
GHG emissions (log tons)	0.03 [-0.01; 0.09]	0.01 [-0.04; 0.07]	0.06 [0.01; 0.13]	0.06 [0.01; 0.10]
Resource rents (% GDP)	-0.11 [-0.21; -0.04]	-0.06 [-0.14; 0.01]	-0.11 [-0.21; -0.04]	-0.08 [-0.15; -0.01]
Agricultural land (% area)	0.03 [-0.03; 0.59]	0.00 [-0.03; 0.34]	0.07 [0.03; 0.42]	0.05 [0.01; 0.41]
Armed conflict	0.04 [0.03; 0.06]	0.02 [0.00; 0.03]	0.01 [-0.01; 0.03]	0.01 [-0.01; 0.03]
Exogenous (dyadic)				
Common language	0.25 [0.18; 0.34]	0.23 [0.16; 0.29]	0.17 [0.10; 0.26]	0.17 [0.10; 0.25]
Contiguous	0.13 [0.03; 0.20]	0.19 [0.09; 0.28]	0.32 [0.21; 0.41]	0.31 [0.22; 0.40]
Colonial relationship	-0.02 [-0.11; 0.08]	0.07 [-0.07; 0.24]	0.15 [-0.00; 0.29]	0.15 [0.02; 0.29]
Free trade agreement	0.27 [0.23; 0.33]	0.18 [0.14; 0.23]	0.22 [0.15; 0.29]	0.21 [0.16; 0.27]
Trade flows (log \$)	0.11 [0.05; 0.17]	0.07 [0.04; 0.11]	0.08 [0.03; 0.12]	0.08 [0.03; 0.13]
Endogenous				
# Reciprocal edges	0.15 [0.01; 0.25]	0.06 [-0.04; 0.15]	0.16 [-0.10; 0.41]	0.02 [-0.22; 0.24]
Geom.-wt. edge. shared partners	0.03 [-0.05; 0.09]	0.05 [-0.04; 0.13]	-0.00 [-0.06; 0.04]	-0.03 [-0.09; 0.01]
Geom.-wt. out-degree	-1.14 [-1.40; -0.74]	-0.96 [-1.17; -0.58]	-0.13 [-0.46; 0.46]	-0.13 [-0.46; 0.44]
Cyclic triples	-0.01 [-0.02; 0.00]	-0.00 [-0.01; 0.00]	-0.00 [-0.01; 0.01]	-0.00 [-0.01; 0.01]
Stability	2.08 [1.95; 2.22]	2.53 [2.43; 2.67]	2.87 [2.83; 2.95]	2.92 [2.86; 3.00]
Time trend	0.00 [-0.01; 0.01]	0.02 [0.01; 0.03]	-0.00 [-0.02; 0.01]	-0.01 [-0.01; 0.01]
Delayed reciprocity	-0.00 [-0.09; 0.10]	0.01 [-0.08; 0.13]	-0.04 [-0.25; 0.15]	0.08 [-0.16; 0.30]
# Edges	-0.69 [-1.65; -0.24]	-0.67 [-1.40; -0.29]	-0.48 [-1.59; 0.21]	-0.19 [-1.39; 0.31]
Country FE	Yes	Yes	Yes	Yes
N(countries)	187	187	187	187
N(possible edges)	660858	660858	660858	660858

Bold text indicates that 0 is outside of the 95% credible interval. Estimates are log-odds from a temporal exponential random graph model with bootstrapped pseudolikelihood methods. 500 bootstrap replications. Models vary in the length of the rolling window for inferring leader-follower relationships.

Chapter 6

Conclusion

In the face of environmental challenges that range from biodiversity loss to nitrogen pollution to climate change, leadership in the development of environmental policy may be more important now than ever. With multiple ecosystem processes exceeding planetary boundaries or threatening to do so in the near future (Steffen et al. 2015), it is critical to identify which countries act as environmental policy leaders—and what can be done to catalyze the adoption and spread of new environmental policies. In this dissertation project, I have addressed both of these questions and demonstrated that transnational advocates can catalyze (or obstruct) environmental policy leadership.

Looking beyond the specific context of the environment, understanding policy leadership and its relationship with transnational advocacy is key to the comparative study of public policy across a wide range of topics. My analysis has particularly strong implications for other policy areas characterized by interdependent policymaking and strong networks of transnational advocates, such as human rights (Keck and Sikkink 2014), women's empowerment (True and Mintrom 2001), and education (Verges and Novelli 2012).

I begin this chapter by providing a summary of my central arguments and findings. Next, I discuss the contributions this dissertation makes to the study of policy leadership, transnational policy advocacy, and comparative public policy more generally. I then suggest several promising paths for future research into the causes of environmental

policy leadership and the consequences of transnational environmental advocacy. Finally, I conclude with some observations about the practical implications of my research to spur policymakers to work, hopefully productively, to address environmental challenges.

6.1 Summary

This dissertation is built upon two core arguments. The first, described in Chapter 2, is that policy leadership is 1) the tendency to take timely action in the development of policy *and* 2) widespread influence over the policymaking of other governments. These two components combine to produce persistent, observable patterns in the timing and content of policy change. Policy leaders both walk the walk, quickly adopting new policies at home, and talk the talk, affecting the decisions of policymakers abroad. This definition of policy leadership lends itself to empirical measurement and explanation when viewed through the lens of network analysis, with governments acting as leaders in a policymaking network if they demonstrate the attributes of both rapid policy innovation (represented as large node size) and widespread influence (represented as a large number of out-going ties to other nodes).

The second argument, explored in Chapter 3, is that transnational advocates, such as international environmental NGOs, international development organizations, and multinational corporations, are uniquely positioned to affect environmental policy leadership. The day-to-day activities of transnational advocates are similar in many respects to their domestic counterparts, spurring policymakers to take positions on environmental policies through communications campaigns, programming, and lobbying. What distinguishes transnational advocates from other political actors, however, is the ease with which they coordinate their policy priorities and advocacy activities across jurisdictions. Working in multiple jurisdictions at the same time, transnational advocates can act as go-betweens, facilitating transnational communication among policymakers. Importantly, transnational advocates are not necessarily neutral connectors, but instead strategic agents amplifying the international impact of their favored policies. I concluded

Chapter 3 by describing a suite of new measures of transnational environmental advocacy, consisting of data on the global presence of large international environmental NGOs, environmental aid by international development organizations, and environmental lobbying by multinational corporations.

In Chapter 4, I take on the challenge of measuring environmental policy leadership. Through a systematic literature review, I show that existing data on environmental policy adoptions largely overlook issues relating to conservation and resource use and tend to limit their data collection to developed countries, typically those in Europe. To overcome this challenge, I introduce policy extraction, a novel approach to identifying environmental policy ideas in the texts of laws and regulations. I then apply the method to the Food and Agriculture Organization's FAOLEX database, generating a new dataset of 3,000 environmental policies adopted by 195 countries from 1887 to 2019. With these data in hand, I construct a measure of environmental policy leadership as the combination of a country's policy innovation rate and its number of follower countries, demonstrating that the environmental policy leadership was relatively low on average until the 1990s, when it started to climb until reaching a peak in the mid-2010s.

Bringing together these new measures of environmental policy leadership and transnational environmental advocacy in Chapter 5, I found that the activities of large international environmental NGOs systematically cause a positive, statistically significant, and substantively meaningful increase in environmental policy leadership. This effect is concentrated in developing countries and for issues relating to traditional environmental issues of flora, fauna, and pollution. Both collaborative and confrontational environmental NGOs had a positive effect on environmental policy leadership, but, perhaps surprisingly, their respective impact appeared to weaken when NGOs with contrasting advocacy styles were present.

Lobbying on environmental issues by multinational corporations did not have a systematic impact on environmental policy leadership in developing countries. In developed countries, however, corporate environmental lobbying led to a sharp decrease in environmental policy leadership, suggesting that multinationals may have substantially

different stances on environmental policy development in rich and poor countries. Environmental aid by international development organizations had little to no effect on environmental policy leadership. Overall, these results support the argument that transnational advocates affect environmental policy leadership, capable of acting both as catalysts (large international environmental NGOs in developing countries) and as impediments (multinational corporations in developed countries) to the adoption and spread of environmental policies.

6.2 Contributions

In this dissertation, I make three primary contributions. The first is to advance the study of policy leadership by embedding the concept firmly in the realm of observable behavior. Instead of relying on subjective judgments of government intent or conflating policy leadership with stringent policymaking, I propose a new, more precise conceptualization that identifies policy leaders solely based on their internal rate of policy innovation and their external influence on policymaking in other jurisdictions. By combining policy innovation with influence, my definition of policy leadership aligns more closely with broader understandings of leaders as actors that take decisive action and affect the actions of their followers.

My second contribution is to the study of policy advocacy. Despite considerable work detailing the formation and strategy of policy advocacy, attributing changes in policy to advocacy is a longstanding challenge. This is in large part due to the difficulty of constructing a plausible counterfactual of what policy changes would have taken place in the absence of a given advocate's activities. The boundary-spanning nature of transnational advocates provides the opportunity to construct just such a counterfactual, allowing me to examine differences in environmental policy leadership across countries with differing levels of transnational environmental advocacy. As a result, I can link changes in public policy to the activities of large international environmental NGOs, international development organizations, and multinational corporations.

Finally, I provide several new datasets that provide a strong foundation for extending the study of comparative public policymaking to new issues and countries. I address the imbalance in existing data on environmental policymaking, working backward from the largest existing compilation of environmental laws and regulations to identify latent policy ideas. In so doing, I aim to support the growing interest in studying public policy beyond developed countries and thematically narrow issue areas.

6.3 Future research

There are at least three promising paths for future research that stem from this dissertation project. The first is to dig into the specific mechanisms of advocacy and how they work. Of the three strategic levers available to policy advocates—information provision, capacity building, and pressure campaigns—which lever is most effective in convincing policymakers to make change, and under what circumstances? Understanding the means by which effective advocacy takes place is an ambitious, but potentially invaluable, goal for political scientists to pursue.

A second topic for future research is the effect of transnational advocacy on the stringency of environmental policy. It is important to understand not just that policymakers respond to advocacy, but the extent to which the policies produced as a result align with advocates' preferences. The data presented in this project shed light only on the latter because they describe the adoption of policy instruments, rather than those policies' specific settings.

There are several potential avenues for studying the relationship between transnational advocacy and environmental policy stringency. These approaches are likely to require an examination of the full texts of the environmental laws and regulations in the FAOLEX database, instead of just their abstracts, to extract more information about what each policy is intended to accomplish. One crude approach would simply identify the prevalence of variants of the word “should,” which enables or empowers certain behaviors, relative to variants of the word “shall,” which mandates or requires certain behaviors.

Similarly, if a policy is longer than its country average, it may contain more details that introduce additional complexity and raise the cost of compliance (see, e.g., [Huber and Shipan 2002](#)).

The third promising area of research is the comparative study of corporate environmental lobbying. Scholars of corporate lobbying generally observe that firms tend to advocate against policy development (e.g., [Cory et al. 2021](#)), but studies of *multinational* corporate lobbying emphasize these organizations' relative openness to environmental policy (e.g., [Garcia-Johnson 2000](#)). According to this logic, multinational corporations may embrace environmental policy proposals as a means of lowering expropriation risk and gaining an advantage over domestic competitors with less experience and available capital for meeting environmental standards.

My analysis indicates that the consequences of multinational corporate environmental lobbying depend on the broader economic context, with multinational environmental lobbying having a null effect on environmental policy leadership in poor countries and a negative effect in rich countries. There is ample room for future work examining how the direction and substance of multinationals' environmental lobbying differ in developed and developing countries. It seems likely that multinationals support for the flow of new environmental policies depends on the existing stock of laws and regulations, favoring environmental policy development only up to the point at which expropriation risk is low and there is little advantage to be gained from marginal changes in environmental policy relative to domestic competitors.

6.4 Practical implications and final thoughts

In this dissertation, my goal was to understand which countries were acting as leaders in the development of environmental policy and whether transnational advocacy was effective in convincing decisionmakers to spend their time and resources on environmental policymaking. I find that these organizations do, in fact, have the capacity to both catalyze and stymie environmental policy leadership.

This result was *not* a foregone conclusion. Focusing on the effect of advocacy on policy change is, in many ways, a hard case. Transnational advocates are often thought to be most likely to successfully affect the implementation or enforcement of environmental policies (Bernstein and Cashore 2012), rather than their adoption. In the course of conducting my research, I frequently encountered skepticism of the power of international environmental NGOs to systematically affect environmental policy change, even from these organizations' own employees. Nevertheless, there is robust evidence that both large international environmental NGOs and multinational corporations can play important roles in environmental policy development.

My analysis shows that policymakers are more likely to spend their time and resources working on environmental problems with greater international environmental NGO presence in developing countries and less multinational corporate lobbying in developed countries. When combined with existing knowledge about the environmental preferences of different advocates, these conclusions lead to two clear practical implications.

First, given that large international environmental NGOs tend to favor stringent environmental policy, it seems likely that their catalytic impact on environmental policy leadership also generates increases in environmental policy stringency. Therefore, along with existing efforts like raising public awareness, linking environmental issues to human health, and making the business case for environmental protection, expanding the activities of large international environmental NGOs should help promote more responsive, more influential, and more stringent environmental policies in developing countries.

Second, in light of existing knowledge about how corporations lobby on environmental issues in developed countries (e.g., Brulle 2018; Cory et al. 2021), the negative relationship between multinational corporate lobbying and environmental policy leadership in developed countries may indicate that multinationals work to thwart increases in environmental policy leadership in the Global North. Of course, many corporations have publicly embraced environmental protection in recent years as part of their broader environmental, social, and governance strategies, so it is possible that corporate environ-

mental lobbying has undergone a sea-change in recent years.¹ However, there remains ample room for skepticism because some firms, such as Exxon Mobil, have privately described their environmental commitments as merely politically expedient “talking points” (Thomson 2021). If future corporate environmental lobbying practices continue to resemble the past, the evidence presented in this analysis suggests that finding ways to reduce lobbying expenditures by multinational corporations is likely to lead to more responsive, more influential, and more stringent environmental policies in developed countries.

Policymakers have demonstrated greater leadership in environmental policy over the past thirty years, but, despite these efforts, many environmental problems have only become more severe. As ecosystem processes near tipping points, it is critical to find ways to accelerate the development and spread of new approaches to promoting sustainable and equitable resource use and conservation. Based on this dissertation, it appears that supporting the activities of large international environmental NGOs in developing countries and reducing lobbying expenditures by multinational corporations in developed countries would be two important steps toward catalyzing greater environmental policy leadership.

¹Examples include Microsoft’s plans to be “carbon negative” by 2030 (Smith 2020) and Shell’s pledge to reach carbon neutrality by 2050 (Weiss 2020), among many others.

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