Mechanisms of informal governance: Evidence from the IEA

Jeff Colgan and Thijs Van de Graaf

Abstract

How does informal governance occur in international organizations? While the extant literature suggests that power asymmetries matter a great deal for explaining the uncodified rules and procedures that often develop within international organizations, we argue that power asymmetries alone cannot explain informal governance. Consequently, we develop two specific mechanisms through which informal governance occurs. First, we suggest that regime complexity can act as a source of incentives and opportunities for informal governance. In the face of regime complexity, informal governance offers an attractive way of keeping states bound to the organization and to manage complex interactions with adjacent regimes. Second, we propose that the coincidence of frozen formal structures and changing causal beliefs allows informal governance to emerge. Problems of great causal complexity are sometimes subject to swings in beliefs about cause-effect relationships, demanding new policy approaches. When such swings occur, and if it is costly to adapt an organization's formal rules, states and institutions often simply create unwritten, informal practices as a way to render the institution dynamic. The plausibility of our conjectures is illustrated using evidence drawn from the International Energy Agency (IEA).

Keywords

International organizations; informal governance; regime complexity; International Energy Agency; global energy governance

Acknowledgements

We would like to thank Mareike Kleine, Jessica Green and Robert Keohane for their comments on earlier drafts.

Introduction

The International Energy Agency (IEA) was designed in the wake of the 1973 oil crisis to promote secure oil supplies. In the event of an oil crisis, the IEA has the power to allocate scarce oil supplies to its member states and stipulate how much of the states' strategic oil reserves are to be released into the market. The formal terms of the IEA's emergency allocation system make it, at least on paper, one of the world's most powerful international organizations. Yet, these formal treaty provisions offer little guidance to how the IEA operates in practice. In fact, each time the IEA has authorized emergency releases of oil stocks in the past, it has done so outside of its formal crisis response system. Member states almost never use the IEA's elaborate voting system to make decisions. The IEA's actual behavior and program of work differ significantly from the original mandate specified in the 1974 International Energy Program (IEP) treaty that established the Agency. In short, the IEA is guided by a system of informal rules and procedures. Why would states create such elaborate and legally-binding formal rules and then circumvent them with informal governance? Why have so many informal elements been introduced in the IEA, as opposed to changing the formal rules?

The behavior of the IEA highlights a broader set of important questions about the nature of informal governance and the conditions under which it occurs. The study of informal governance is rapidly attracting attention by scholars of international organizations. This attention is driven principally by a growing recognition that existing theories of international organizations are based on their formal attributes rather than on the way in which they actually function (Stone, 2013). The burgeoning literature on informal governance suggests that uncodified rules and procedures matter a great deal for explaining the functioning of international organizations. Existing research contends that informal governance arises as a way of resolving significant power asymmetries between the member states of an organization (Stone, 2011),[1] and we offer fresh evidence in support of that hypothesis, drawing on the case of the IEA. By focusing on a less-studied international agency such as the IEA we show that this hypothesis has external validity beyond the population of large and powerful international organizations that have hitherto received most attention in this field of research (e.g., International Monetary Fund, European Union and World Trade Organization).

However, we also suggest that power asymmetries alone cannot explain informal governance; instead, they act as a scope condition (or necessary condition). Power asymmetry plays a constant role at the IEA (where US dominance has varied only by degree over time), and as such it is not sufficient to explain the variation in when and how informal governance has emerged. Consequently, we propose and illustrate two new mechanisms that shed light on the specific processes by which informal practices develop within an international institution.[2] Following Little (1991: 15), we define a “mechanism” as a sequence of events, conditions, and processes leading from the *explanans* (power asymmetries) to the *explanandum* (informal governance).

The first proposed mechanism relates to regime complexity. A regime complex is “an array of partially overlapping and non-hierarchical institutions governing a particular issue area” (Raustiala and Victor, 2004; see also Alter and Meunier, 2009). We suggest that the presence or emergence of various overlapping and parallel institutions in the same issue area can constitute a source of incentives and opportunities for informal governance because the various institutional arrangements provide a variety of exit options for powerful states from any particular institution within that complex. In the face of regime complexity, informal governance could be an attractive way for other states or organizations of keeping such states bound to the organization. Moreover, it also allows actors to manage the complex and often fluid interactions with adjacent regimes. This article thus links two recent conceptual innovations, namely informal governance and regime complexity, and is the first article to explicitly explore their interaction.

A second mechanism that allows informal governance to emerge is when frozen formal structures coincide with changing causal beliefs. Frozen formal practices refer to a situation where formal arrangements cannot easily be changed or avoided, for example because of opposition by the vested interests of those with greater privileges under the status quo (*i.e.*, power asymmetries). When such frozen structures coincide with a change in the prevailing beliefs about the type of problem at issue or about the best way to deal with it, informal practices tend to develop. These practices thus help to render an institution dynamic.

We focus on mechanisms rather than variables: for example, we do not argue that "increased" regime complexity causes "increased" informal governance or makes it more likely. Instead, we argue that regime complexity plays an important role in the process through which informal governance is generated, at least some of the time. Similarly, the combination of changing causal beliefs and frozen formal structures plays an important role in the process of informal governance, at least some of the time.

We illustrate these mechanisms with the case of the IEA. While we focus only on a single institution, we use multiple observations within that institution's history to evaluate our proposed mechanisms. We evaluate our first mechanism, regime complexity, using three different pieces of evidence drawn from the IEA's behavior (its relationship with the G7/G8, with OPEC, and with the International Renewable Energy Agency). We then evaluate our second mechanism, changing causal beliefs and frozen formal structures, using four pieces of evidence (the circumvention of the IEA's formal oil allocation system; the adoption of the CERM;[3] the broadening IEA mandate; and the relationship with OPEC and other external bodies). In doing so, we find that informal governance affects not only the decision-making of the IEA, but also its mode of operations, the way in which its program of work is set, and its interactions with other organizations. For instance, we find that the US can informally override the IEA's formal decision-making mechanisms regarding releases of oil from its members' reserves; that the IEA's agenda is heavily influenced by the G7/G8 even without any formal link between the organizations; and that the way the IEA seeks to respond to oil crises has changed, as it now views surplus production capacity in OPEC as the first line of defense in such an emergency. One novel aspect of these empirical findings is that they move significantly beyond the organization's top-level decision-making, which has been the focus of most of the empirical work on informal governance to date.[4]

Theoretical and Conceptual Framework

We follow a set of existing definitions for informal governance. Helmke and Levitsky (2004) define informal institutions as "socially shared rules, usually unwritten, that are created, communicated, and enforced outside of officially sanctioned channels." Similarly, Kleine (2010) defines informal governance as "uncodified rules of behavior running parallel to the formal treaty rules." We amend Kleine's definition slightly to add that uncodified rules of behavior can also run parallel to formal procedures used in international organizations. Informal governance contrasts, of course, with formal governance. In international politics, formal governance is manifested by the rules and procedures of treaties (bilateral or multilateral) and formal international organizations (IOs).[5] The latter includes formal intergovernmental organizations, which are described by Pevehouse *et al.* (2004) as having three distinct characteristics: a formal existence established by an international treaty; three or more states as members; and a permanent secretariat or headquarters. Some scholars (Vabulas and Snidal, 2013; Verdier, 2012) have studied the choice between informal and formal organizations, but we restrict ourselves in this article to forms of informal governance within the context of formal international organizations.

The large extant body of work on formal institutions and formal governance provides significant theoretical insights, even as it has been criticized for its limitations. Keohane's (1984) seminal work on international institutions established that states might seek to use institutions as a way of sharing information and reducing transaction costs in their efforts to capture and distribute the mutual gains from cooperation. Further work showed that states rationally design formal institutions in ways that provide them with flexibility even as the institutions provide credibility to their commitments (Downs *et al.* 1996; Abbott and Snidal, 2000; Koremenos *et al.*, 2001; Helfer, 2012). Formal agreements are often designed such that states can escape from their commitments if they become too onerous (Koremenos, 2005; Rosendorff and Milner, 2001).

Despite these and other insights, Stone's (2011) work suggests that theories of formal institutions are inadequate to fully explain the behavior of states or the international organizations that they create. Specifically, Stone argues that existing theory is "not very helpful for explaining institutional failures, because it only explains efficient adaptations to incentive problems. It cannot shed light on the reasons why institutions might be designed inefficiently …" (Stone, 2011: 24). Moreover, most work cannot easily explain how, when, and why states circumvent the formal rules that they establish. Stone's research on informal governance gives us significantly more leverage on these questions.

While the burgeoning literature on informal governance suggests that it matters a great deal for explaining the behavior of international organizations and their interactions with states, there is still considerable debate and uncertainty about when and what types of informal governance emerge. Scholars have identified a variety of conditions and causal mechanisms that might help to explain the presence of informal governance (Lipson, 1991; Downs and Rocke, 1995; Raustiala, 2002; Christiansen and Piattoni, 2003; Whytock, 2005; Cogan, 2009; Shaffer and Pollack, 2010; Stone, 2011; Kleine, 2010, 2013; Christiansen and Neuhold, 2012).[6] A comprehensive theory of informal governance remains elusive.

Mechanism 1: Regime Complexity

We aim to further our understanding of informal governance by highlighting two mechanisms through which it occurs. Our first mechanism focuses on the ways in which regime complexity could foster the emergence of informal governance. As noted earlier, a regime complex is "an array of partially overlapping and non-hierarchical institutions governing a particular issue area"

(Raustiala and Victor, 2004; see also Alter and Meunier, 2009). As such, it is to be situated somewhere in between single, legally-integrated international regimes, on the one hand, and highly fragmented arrangements, on the other hand (Keohane and Victor, 2011). Scholars have identified regime complexes in such diverse issue areas as climate change (Keohane and Victor, 2011), international trade (Bush, 2007), refugee politics (Betts, 2009), election monitoring (Kelley, 2009), plant genetics (Raustiala and Victor, 2004), intellectual property rights (Helfer, 2009; Yu, 2007), and energy (Colgan et al., 2012).

To explain the link between regime complexity and informal governance, we start from the established view in the extant literature that informal governance arises as a way of resolving significant power asymmetries between the member states of an organization (Stone, 2011; Cogan, 2009; Whytock, 2005; Kleine, 2010, 2013). For instance, Stone finds that when the United States has strong preferences, it is able to use informal procedures that circumvent the formal decision-making rules at the IMF in order to achieve its goals. Similarly, Cogan (2009: 212) argues that "informal agreements largely take account of, and reallocate authority to match, the differences in power and interests that pervade the international system when those differences cannot be acknowledged formally." What characterizes a powerful state is that it has viable outside options to multilateral cooperation, and it might be tempted to simply exit the international organization altogether if there seem to be better routes to pursuing its interests (Stone, 2011; Hirschman, 1970).

This is where regime complexity comes into play. The presence of multiple overlapping institutions aggravates the problem of outside options, because powerful states can choose to pursue their interests in a different institutional forum (Drezner, 2009; Helfer, 2009; Busch, 2007). Informal governance can create more flexibility in the manner in which powerful states pursue their interest, therefore making it relatively more attractive to stick with a given institution and relatively less attractive to pursue outside options. Regime complexity creates additional exit options for states that would not exist if there were only one institutional forum for cooperation (or none), because regime complexity necessarily implies multiple overlapping institutional options.[7] To the extent that informal governance reduces the tendency of states to use outside options, it keeps states bound to the organization. In turn, the outside options inherent in regime complexity create the incentive for an organization to develop modes of informal governance. In short, we suggest that regime complexity may indirectly stimulate informal governance by acting as a multiplier of credible outside options for the leading power(s).

Further, we argue that regime complexity might stimulate the emergence of informal governance in another way, not by multiplying the outside options for the leading state, but by changing the external opportunity structure for the organization itself. Heretofore we have treated states as the key actors in creating informal governance, but it is also possible that institutions themselves might develop informal governance. When an organization is embedded in a regime complex, it is structurally linked to other components of the complex. The links with adjacent institutions could be synergistic, cooperative, or conflictive, and may shift between these categories over time (Biermann et al., 2009). These types of institutional linkages matter as they could influence an organization's effectiveness (Gehring and Oberthür, 2009). To manage these complex and fluid institutional interactions, an international organization might develop informal practices, which may either be entirely self-contained or relate to the relationship with the neighboring regime. Here we assume that the organization has at least a modest amount of agency from its principals to develop such practices (Hawkins *et al.*, 2006; Bradley and Kelley, 2008). The organization's incentive to do so is to increase its attractiveness to its member states, thereby ensuring its continued survival.

Regime complexity is particularly important in light of different types of informal governance. Scholars identify an array of different governance functions and roles that international agreements and organizations perform (Bradley and Kelley, 2008; Green and Colgan, 2013). Existing work principally focuses on how informal governance affects the top-level decision-making or "legislative" function of international organizations, but there is no reason why informal governance could not affect an organization's other behaviors, such as its operations, the implementation of its decisions, the way in which its program of work is set, and how it interacts with other organizations.

Mechanism 2: Frozen Formal Practices and Changing Causal Beliefs

While the first mechanism considered the organization's external institutional environment, our second proposed mechanism focuses on the internal characteristics that might help to explain the presence of informal governance. In particular, we suggest that the combination of changing causal beliefs and frozen formal structures is an enabling condition for the development of informal governance practices.

Consider the causal beliefs about the nature of the problems that the organization was designed to address. Goldstein and Keohane (1993: 10) define causal beliefs as “beliefs about cause-effect relationships which derive authority from the shared consensus of recognized elites.” These conceptualizations of cause-effect relationships change more frequently and more quickly than world views or principled beliefs. Problems of great causal complexity such as climate change or disruptions to the global oil supply are especially vulnerable to sharp changes in causal beliefs.[8]

When causal beliefs change, the formal rules laid down for such organizations might quickly become infeasible or unattractive to member states as they seek to address those problems. There is variation across institutions regarding the ease with which the states’ formal commitments through the international organization can be changed or avoided. Scholars have identified ways in which some organizations provide formal “escape clauses,” or authorized unilateral departures from formal commitments in the event of unforeseen circumstances (Rosendorff and Milner, 2001; Bagwell and Staiger, 1990; Downs and Rocke, 1995; Sykes, 1991; Schwartz and Sykes, 2002). Changing causal beliefs form little problem for organizations that have flexible formal structures and decision-making procedures.

Organizations without these escape clauses to formally allow states to alter or avoid their commitments, however, often have little option but to use informal governance as a way of adapting to unforeseen circumstances. A full renegotiation of the formal structures and procedures of an organization involves far higher transaction costs and risks than resorting to informal practices. Informal governance offers an attractive way to circumvent the formal rules and yet still achieve the mutual gains from cooperation that states seek.[9] There is therefore an incentive for informal governance in areas of considerable causal uncertainty where beliefs are changing over time, such as financial or environmental crises, and where the formal structures of cooperation are relatively "frozen" in time. By contrast, states might be able to rationally design sufficient formal rules for problems over which they have repeated experience or an unusually clear and complete causal understanding of the problem, making informal governance unnecessary.

Formal Governance and Power Asymmetry at the IEA

Having developed these theoretical propositions, we now seek to illustrate their plausibility using the case of the International Energy Agency. We do so in the following way. First, we describe the origins and nature of the formal governance rules at the IEA. Second, we discuss the structural power of the US in the context of the IEA. In the subsequent section, we turn to the most important job: probing the plausibility of each of our mechanisms.

Formal Governance at the IEA

Founded in the wake of the first oil shock as a daughter organization of the OECD, the IEA's primary mission was to administer a system of collective energy security among industrialized countries (Colgan et *al.*, 2012). The IEA's functions and responsibilities are spelled out in the Agreement on the International Energy Program (IEP), signed by the IEA's initial sixteen member states in November 1974.[10] At the heart of the IEP lay a set of rules on mandatory sharing of oil supplies in emergencies, which authorized the IEA secretariat to declare an oil supply emergency and allocate tranches of available oil to needy member states. Here, we describe the formal rules of the IEA, focusing on three features: its oil allocation system, its voting rules, and its program of work under the IEP.

Oil allocation system. The primary goal of the IEA is "to promote secure oil supplies on reasonable and equitable terms" (IEP Agreement 1974, preamble). According to the formal treaty, this goal is to be accomplished through several instruments. First, IEA member countries are obligated to hold emergency oil stocks equivalent to 90 days of the country's net oil imports.[11] Second, the member countries are required to have a program for emergency demand restraint: *i.e.*, a set of policies that the government can enact in order to temporarily reduce the country's economic demand for oil. Third, the IEA puts in place an emergency sharing system to deal with possible oil-supply shortfalls, which allows the IEA secretariat to determine the oil allocation rights and obligations of member countries (IEP Agreement 1974, chapters I-IV).[12]

The oil-sharing system is triggered when the IEA secretariat makes a "finding" that oil supplies, either for the group as a whole or for a specific member country, have been or can reasonably be expected to be reduced by 7 percent below a base period (consisting of four quarters, lagged by one). Once the secretariat declares an emergency, the system automatically goes into effect unless the IEA's governing board overrules the secretariat with a special majority of weighted votes (IEP Agreement 1974, art. 19). The governing board, in which each member country has a seat, has only eight days to reverse the finding. Doing so requires the affirmative vote of at least 75 percent of the entire membership (IEP Agreement, 1974), which is extraordinarily difficult to obtain.

The formal terms of the IEP's emergency system represent, in the words of Keohane (1984: 225), "a remarkable delegation of authority to an international organization." The IEA's founding fathers had deliberately opted for legally binding rules on oil-sharing to avoid the situation in which the member states had found themselves in the 1973 crisis, where each state scrambled for available oil supplies, making oil supplies scarcer for other states, and thus aggravating the crisis.

Voting rules at the IEA. The IEP established that the governing board decides by majority for most decisions and by special majority for the most important decisions (mostly relating to the oil allocation system). Rather than using the "one country, one vote" rule, IEA member countries are accorded weighted votes, calculated on the basis of two components: a "general" voting weight, equally distributed at three per member country, and an "oil consumption" voting weight, allocated according to the amount of oil consumed by the member country in 1973. See Table 1.

[insert Table 1 around here]

The IEA's program of work under the IEP. The IEP Agreement identifies five key functions for the IEA: running the oil allocation system (IEP Chapters I to IV), providing an information system on the international oil market (Chapter V), consulting with oil companies (Chapter VI), facilitating long-term cooperation on energy (Chapter VII) and coordinating relations with producer countries and other consumer countries (Chapter VIII). By far the most detailed provisions are those that relate to the emergency sharing system and the oil market information system. In most other areas, the IEP stipulates only a general framework rather than a detailed programmatic action plan. The IEP agreement provides the IEA's governing board with broad authority under Article 51 for the functioning of the IEP program overall. Article 51 gave the governing board a mandate to "adopt decisions and make recommendations which are necessary for the proper functioning of the program" (IEP Agreement, 1974, Art. 51). The board has exercised this authority in part by adopting annual programs of work from the outset in 1974 (Scott, 1994, p. 277).

Scholars have noted that the IEA was set up in first instance as an insurance regime for oil-importing countries rather than as a control-oriented regime (Keohane, 1982). Since the agency was set up at the height of an oil shock, its founding fathers wanted it to become operational as soon as possible. When negotiating the IEP, they therefore invested most of their time in drafting the detailed provisions of the oil allocation system. The other provisions, such as the IEA's information system and its long-term cooperation on energy policy, were included with much less precision.

Evidence of Power Asymmetry: US Structural Power

We now consider the evidence regarding our key scope condition for informal governance, namely the existence of significant power asymmetries between the member states of an organization. In the context of the IEA, there are clearly significant power asymmetries, with the United States being by far its most important member. There is substantial evidence that the United States circumvents the formal procedures of the IEA.

In Stone's (2011: 47) terms, structural power represents the outside options a country enjoys and the positive externalities its participation in an institution creates for others.[13] Applied to the IEA, the United States clearly emerges as the most powerful member country. The United States commands the largest government-owned petroleum stockpile in the world, the Strategic Petroleum Reserve (SPR), which currently stands at 694.9 million barrels of oil.[14] Its maximum drawdown capacity of 4.4 million barrels of oil a day, which it can sustain for about 160 days, is slightly larger than Iran's daily contribution to world oil supply in 2010 (BP 2011). This endows it with more options to act outside of the IEA than any other member. Simply put, the economics of the situation are such that "if the United States does not draw stock, it would be futile for others to do so" (Toner, 1987: 58). The overwhelming weight of the US SPR was evident again when the IEA decided to release emergency oil stocks in June 2011, in the aftermath of the Libyan war. In this case, not less than half of the release came from the US SPR and the rest was divided proportionally among the IEA countries that individually consume more than 1 percent of final oil consumption, as is illustrated in Figure 1.

[insert Figure 1 around here]

At the time of the IEA's creation, the United States derived further structural power from its position as leader of the western military and political alliances. At the time when it proposed to set up the IEA, the US even threatened uncooperative allies with a partial NATO troop withdrawal (Kapstein, 1990, 152). The US was also "home to the vast majority of the major oil companies operating internationally, upon which the IEA information and emergency systems depend" (Toner, 1987: 58). So, since the early days of the IEA, US cooperation has been essential for the agency to discharge its core tasks: to operate the oil emergency scheme and the oil-market information system. This has led astute observers to conclude that "nothing important can happen [in the IEA] unless the United States desires it" (Conant, 1982: 74). In the words of Toner (1987: 58), the United States could not be considered "a member like the others in the IEA. It is the equivalent of Saudi Arabia in OPEC, though even more dominant."

The US has employed this structural power to circumvent formal IEA procedures in the past. Perhaps the clearest example of this was the way in which the US overrode the oil allocation system in its first real test, in the oil crises of 1979-80. During this period, the global oil market experienced two significant oil market disruptions: the first associated with the 1979 Islamic Revolution in Iran, and the second due to the outbreak of the Iran-Iraq war in 1980. Rather than formally activating the emergency provisions laid out in the treaty, curiously, the IEA secretariat resorted to informal measures to facilitate oil shipments to countries suffering shortages in these crises. No findings were made by the secretariat, no votes were taken, and the oil-sharing system was not activated (Keohane, 1984). When Sweden formally requested the activation of the IEA's emergency system, in May 1979, the secretariat did not make a finding because there was little sympathy among other member countries for Swedish price controls, and the general expectation was that the Swedish shortfall would not be prolonged (Toner, 1987: 44). When the Swedish and Belgian governments allowed oil companies to draw stocks below the 90-day compulsory level, the IEA did not compel compliance with the IEP Agreement. Thus, the IEA merely served as a sort of clearing-house for informal cooperation among western oil consumers as if there were no formal treaty provisions on cooperation for oil supply crises.

The preferences of the powerful states were one important reason why the IEA did not enact its formal emergency supply allocations system in 1979 and 1980. The most powerful members of the agency, including the United States, Japan, Germany and the United Kingdom preferred this informal approach (Keohane, 1984: 230-1; Toner, 1987: 43). They were able to override the preferences of the weaker IEA members such as Sweden, which wanted to activate the formal emergency allocation system. Plausibly, the IEA did not hold itself or its members to the letter of its rules for fear of undermining the member states' political support for the agency itself.

More recently, the United States has supported releases from oil reserves, in contrast to its position in 1979 and 1980. The IEA has authorized emergency releases from its members' reserves only three times in its history: in the wake of the Iraqi invasion of Kuwait in 1990-91; in response to Hurricanes Katrina and Rita in 2005; and during the Libyan civil war in 2011. On all three occasions, the US has strongly supported the IEA's decision. Some scholars have suggested that US insistence played a pivotal role in causing the releases to occur (Chakarova, 2010: 27; Mabro, 2006: 7-8).[15]

However, as we note below, the preferences of the powerful states do not fully explain why the system was not used in 1979-80 or any time since then. Despite the existence of an elaborate allocation system, the IEA makes its decisions about releases from its member states' strategic petroleum reserves on the basis of a new, less rigid system and a set of informal governance practices. We attribute this shift in part to a change in the member states' causal beliefs about the oil market, the difficulty in reforming the IEA's formal voting system, and the rapprochement with OPEC, as described below.

Empirical Evidence of Mechanisms for Informal Governance

Evidence for Mechanism #1: Regime Complexity and Informal Governance

We now seek to show how informal governance is pervasive in the IEA's behavior. We start by probing the plausibility of our first mechanism, namely that, when and where it exists, regime complexity can act as a source of incentives for informal governance. Colgan et al. (2012) describe how the oil consumers' regime centered around the IEA has gradually morphed into a broader energy regime complex. The proliferation of organizations noted by Colgan et al. provides ample evidence that the member states have multiple outside options for pursuing their objectives, options that they have exercised at times such as in developing the Energy Charter Treaty or the International Renewable Energy Agency. We describe three pieces of evidence of how this growing complexity has provided incentives for informal governance within the IEA: first, how regime complexity affected a shift in the IEA's mandate, making the agency less focused on its oil crisis response system (the core of its formal mandate from the 1974 treaty) and more focused on other tasks. Second, we note how regime complexity has affected its crisis response system, due to an increasingly important but informal understanding with its former adversary, OPEC. Third, we describe how regime complexity and the emergence of an overlapping institution has forced the IEA to modify its program of work and its thinking with regard to renewables.

Evidence Item #1a: The uncodified relationship between the G7/8 and the IEA. Formally speaking, the governing board is the IEA's highest decision-making organ, but the agency has in the past been tasked by another, outside body: the G7, and later the G8. At the 1979 Tokyo summit, for example, the G7 agreed to a set of energy policy commitments, which were later reaffirmed by the IEA's governing board (Keohane, 1984: 231). The G7 countries set country-level targets to curb oil imports by 1985 below stated ceilings and created a high-level group to review the progress made. Ultimately, this G7 mandate did not have a long-lasting impact on the IEA's functioning. However, the Tokyo mandate was perhaps the first instance in what became a pattern of unwritten practices adopted by the IEA, namely to implement agendas pressed upon it by the G7/G8.

The G8 call for action from its 2005 Gleneagles summit, in particular, has profoundly affected the IEA. In Gleneagles, the G8 leaders called upon the IEA to produce new studies and reports on climate change and clean energy. At their subsequent meetings, they made additional requests to the IEA. In response, the IEA has come out with a plethora of studies on sustainable energy and the energy side of climate change.[16] It is fair to say that the G8 has catapulted the issue of climate change to the top of the IEA's agenda. Of course, the G8 tasks had to be approved by the IEA's governing board, but this did not cause any problems. The requested work was, after all, largely coincidental with the work of the IEA in general and the G8 countries provided the lion's share of the funding for the tasks undertaken (Van de Graaf and Lesage, 2009). In addition, the IEA might have feared losing the support from some of its major constituents if it did not act on their call. The close interaction process between the G8 and the IEA has even gone so deep that the latter is sometimes portrayed as the "*de facto* energy secretariat of the G8."[17] The IEA secretariat benefits from this relationship, because it helps its member states to stay invested in the agency. The uncodified but real relationship between the G7/G8 and the IEA is thus an illustration of informal governance at work.

At the G8 energy ministerial in June 2008, the G8 countries plus China, India, South Korea and the EU decided to create a new, dedicated body for energy efficiency: the International Partnership on Energy Efficiency Cooperation (IPEEC). Importantly, the secretariat of the new body was institutionally nested within the existing IEA structures, allowing IPEEC to draw on the IEA's experience. This was not an obvious decision to make because the IEA's membership is limited to OECD countries and IPEEC was designed to have a much broader membership. These examples illustrate how a select club of IEA member countries and non-member countries, gathered at the G7/G8 summits, have taken decisions in the past that have profoundly shaped the IEA's agenda, operations, and even its institutional structure.

On the face of it, this could be seen as mere evidence of the leading power's ability to shift the debate "to a meeting of a small group of important countries, and present the results of prior coordination as a consensus decision" within the IEA (Stone, 2011: 14). Yet, the evidence does not suggest that the US has used the G8 forum to force a change in the IEA from above. Rather, the particular outcomes seem related to internal G8 dynamics, on the one hand, and autonomous agency by the IEA staff on the other. By placing energy high on the agenda of the 2005 Gleneagles summit, for example, British Prime Minister Blair hoped to alter the negative image he had built up domestically by siding closely with the Bush administration in the Iraq War of 2003. The fact that a British delegate, Joan MacNaughton, then chaired the IEA's governing board was also helpful in aligning the two institutions' agendas. Moreover, there are signs that the IEA staff has actively sought support and political validation from the world leaders for getting additional tasks that might otherwise have gone to a rival organization if the IEA had not acted on it (Van de Graaf and Lesage, 2009). The symbiotic G8-IEA tandem has since emerged as the principal driving source behind some important innovations in global energy governance, yet their interaction process has remained informal and uncodified.

Evidence Item #1b: Rapprochement with OPEC and its effect on IEA operations. As we theorized earlier, informal governance can be created by both states and institutional actors. In the IEA-G7/G8 relationship just described, states arguably played the major role, though the IEA secretariat might have encouraged the development of this informal governance relationship. An even more striking example of an institutional effort to develop informal governance can be seen in the changing IEA-OPEC relationship. Even though they do not have overlapping members, the presence of OPEC offers an opportunity for the IEA to govern the oil market in a way that is not foreseen in its formal rules and even contradicts its treaty provisions: namely, by making its emergency oil stock releases dependent upon OPEC's prior failure to pump more oil.

Even though the IEA was initially created to offset OPEC's market power, today the IEA views the spare capacity of (some) OPEC producers as the first line of defense in an oil supply disruption – and thus an integral part of the IEA's own operations. This is a striking reversal from the creation of the IEA as a direct response to the 1973 oil embargo. The IEA's founding father, Kissinger, initially wanted to create an anti-OPEC consumers' cartel that would "strengthen the bargaining position of the consumers vis-à-vis the producers" (Kissinger, 1982).

On European and Japanese insistence this idea was toned down. Nonetheless, the IEA and OPEC remained clearly antagonistic to each other. This was illustrated during the North-South Conference of 1976-1977, which had raised hopes for a constructive producer-consumer dialogue but produced disappointing results. OPEC and the IEA were unable to agree on even the most basic issues, such as continuing consultations on energy (Scott, 1995: 61).

Over the years, however, a thaw in the relationship could be observed. Robert Priddle, the IEA's Executive Director from 1994 to 2003, was the first to directly speak to his counterpart at OPEC at a secret meeting in Vienna in 1995 (Van de Graaf and Lesage, 2009). The dialogue warmed when Claude Mandil took office as the new head of the IEA in 2003, and the informal IEA-OPEC collaboration intensified. In this period, Deputy Executive Director of the IEA, Bill Ramsay, built up "a strong dialogue below the horizon" with OPEC and the major Gulf countries.[18]

During the 2003 Iraq war, and again during the hurricanes Rita and Katrina in 2005, the IEA-OPEC informal coordination went a step further. It had become clear that both producers and consumers had an interest in a stable market. Producers had been ravaged by the market share strategy of Saudi Arabia in 1985 and 1986, which led to a collapse in oil prices, and IEA members with large producing sectors (United States, United Kingdom, Canada, the Netherlands and Norway) had suffered right along. This sense of shared vulnerability paved the way for closer informal cooperation, as Ramsay reveals:

> We consulted on each of these crises to get as much harmony in our collective (IEA/OPEC/Major Producer) public posture as possible to be convincing to the market

> that we could weather the storm. More practically, we wanted to draw on geologic resources of oil rather than strategic resources and producers were happy to give us their support so they could sell more oil. In the case of the hurricanes, we needed product so our supplier country contacts told us to go ahead and draw IEA stocks as much of them were in [refined oil] products [such as gasoline]. (Ramsay, 2010)[19]

In other words, even though the IEA could have acted in response to the events in 2003 that led to tight oil markets (the Iraq war, a strike in the Venezuelan oil sector, and unrest in Nigeria) by releasing oil from its strategic reserves, it preferred to informally coordinate with OPEC countries with spare capacity to pump more oil. The IEA's governing board hammered out a strategy whereby the IEA would refrain from releasing oil stocks if OPEC could guarantee that it will make up any supply shortfall. When the IEA finally did decide to release oil from its reserves in the wake of the hurricanes of 2005, it did so only because there was a lack of refined oil products (the hurricanes had wiped out much of the refining capacity in the Gulf of Mexico), which OPEC could not deliver.

In sum, today the IEA and OPEC appear to have a tacit agreement that, in case of a sudden oil supply shortfall, OPEC's spare capacity is to be tapped before the strategic stocks are released: "30 years of energy security policymaking by the consuming countries of the IEA came to a head in the conclusion that OPEC's spare production capacity, read Saudi Arabia, would officially be the first line of defense in an oil emergency" (Emerson, 2006: 3382). This kind of informal governance of the oil market was brought about by the fact that both institutions co-governed the same issue area and had grown aware over the years of their shared interests and covulnerability. This changed the external opportunity structure for both organizations and led them to informally coordinate on oil market governance.

Evidence Item #1c: The IEA's reaction to the creation of IRENA. A third piece of evidence of where regime complexity led to informal governance relates to the creation of the International Renewable Energy Agency (IRENA). This new institution forced the IEA to shift its thinking and the way it addresses renewable energy within its larger energy policy work.

IRENA was established in January 2009 as a completely new, standalone intergovernmental organization. Strikingly, the creation of IRENA was spearheaded by three founding members of the IEA—Germany, Denmark and Spain—even though the IEA had been working on renewables for years.[20] Needless to say, the IEA staff was not pleased to see a new institution being created in what they regard as their turf. Consequently, they tried to prevent this new institution from being successful by stepping up their renewable energy work and by being more upbeat about this sector (Van de Graaf and Lesage, 2009).

To be sure, the IEA had done work on renewables prior to 2009. In 1999, the IEA had created a renewable energy unit to provide support to the Working Party on Renewable Energy Technologies, which was itself created in 1982 as an advisory body on renewable energy. Moreover, the agency has maintained a "policies and measures" database on renewable energy since 2004, operated a small dozen of Implementing Agreements on specific renewable energy technologies, and renewable energy has been a part of its data collection efforts more generally.

With IEA members threatening to create IRENA, however, the process clearly accelerated. In September 2008, the IEA moved its renewable energy unit from the Energy Technology Office to the Directorate of Energy Markets and Security. The unit was also upgraded into a division, staffed by 9 full-time analysts, as a sign that the agency was aware of the priority its members (especially Germany, Denmark, and Spain) placed on integrating renewable energy technologies into the market to reduce CO2 emissions. In addition, the IEA began to express itself unusually positive about the prospects for renewables. In two reports on solar energy published in May 2010, the IEA predicted that concentrated solar power and photovoltaic solar power could supply up to a quarter of global power production in 2050. This was much more than the IEA has ever envisioned in any of its scenarios (including the climate scenarios) in its annual World Energy Outlook reports.[21]

Ultimately, of course, the IEA failed to prevent the creation of IRENA. Still, the impeding threat of “institutional exit” – i.e., moving some of the work on energy policy to another agency – very clearly altered the IEA’s behavior, both in anticipation of that exit and after it occurred. Moreover, these changes were nowhere codified in formal rules or ratified by treaty; instead, they represent a form of informal governance.

In sum, this case illustrates that member states sometimes act on their threat to exit an organization and, when they do, the process increases informal practices running parallel to formal treaty rules in the incumbent organization. The establishment of a countervailing institution has made the IEA much more responsive to the views and interests of the supporters of renewables, because it creates opportunities for forum-shopping. Given their membership overlap and similar jurisdictions, the IEA and IRENA are clearly competing for the same human and financial resources. This has affected the IEA's behavior in ways that are not enshrined in its formal mandate.

Evidence of Mechanism #2: Frozen Formal Rules and Changing Causal Beliefs

We now turn to our second mechanism: the combination of frozen formal structures and changing causal beliefs in major states could spur the development of informal practices. First, we show how the IEA's formal rules have remained frozen over time. We then show how changing causal beliefs, within the context of those frozen formal rules, led to informal governance. We illustrate this process using four pieces of evidence: the circumvention of the formal oil allocation system; the adoption of the CERM; the broadening IEA mandate; and the relationship with OPEC and other external bodies.

Context: IEA's Frozen Formal Rules. One striking feature of the IEA's voting system is that it has remained structurally frozen in time, despite the fact that it was designed to change over time. The IEP lays out an explicit procedure by which the voting rights of each member state would be redistributed annually, according to the relative magnitude of each state's oil consumption (IEP Agreement, 1974, art. 62.6).[22] However, the procedure has never been applied, and the voting rights of each member state continue to be based in large part on its 1973 net oil imports. In the 1990s, there were multiple efforts to find a way to redistribute the IEA's votes, but all such attempts were defeated (Bamberger, 2004: 29). Once again, the formal practices of the IEA are being circumvented by uncodified rules of behavior.

A key reason why the voting rights have never been changed is that powerful states, especially the United States and the United Kingdom, benefit from the existing distribution of votes. Consequently, there was little incentive for them to support a reform. Colgan *et al.* (2012) calculated the difference in votes each country would receive if the voting structure were modified to reflect the net oil imports in 2005. While South Korea and Spain stand to benefit significantly, the United States, the United Kingdom, and Canada would all lose a number of votes.[23]

The rigidity in the voting system created an incentive for the informal practice of taking decisions by consensus (without a formal vote) which has come to dominate the decision-making at the IEA. This allows powerful states to retain their privileges and ability to sway the decisions at the IEA, while lessening the pressure from states disadvantaged by the current voting system for reform. Moreover, as discussed earlier, the major decisions to authorize oil releases into the international markets are often guided by US preferences and informal governance practices in any case.

Evidence Item #2a: Overriding the oil allocation system. It is striking that the IEA's formal allocation system has never been used.[24] This disuse occurs despite the long negotiations establishing the system, the legally binding rules, and the ingenuity of the emergency oil sharing system. Although we acknowledge the importance of managing power asymmetries in the IEA's decision in 1979 and 1980 not to use its formal oil allocation system, it is more difficult to explain the IEA's continuing and ongoing reluctance to use its formal system in this way. Preferences of states change from situation to situation, and the US has on occasion been an active supporter of releases from the IEA's collective oil reserves. If the preferences of powerful states were the only obstacle, the IEA's formal system surely would have been used long ago.

One plausible reason for the move away from the formal system was that, by 1979, IEA member states had come to understand that the energy market had changed substantially. In 1973-74, crude oil was bought and sold through bilateral agreements on the basis of its chemical makeup and field of origin, fixing movement of supply on a global level. Since these barrels of oil were not substitutable, the oil market was remarkably inflexible, and had little capacity to adapt to sudden shocks. A few years later, however, the situation had changed. Nationalizations in oil-exporting countries broke up the vertically integrated oil industry and, ironically, paved the way for more liberalized oil trade. The market was given a significantly freer hand to guide the exchange of crude oil. As a consequence, most of the IEA member states came to believe that the IEA's interventionist oil-allocation scheme was no longer fully appropriate for responding to oil shocks. Since the nature and causal beliefs of the oil problem had changed, the IEP's emergency sharing system was not put into effect. In 1979 and 1980, the IEA instead resorted to informal governance. During those crises, the IEA merely served as a "facilitator of agreement," both among governments and between governments and companies, and it reduced uncertainty by providing reliable information to them (Keohane, 1984: 235-6).

Evidence Item #2b: The emergence of a parallel oil crisis response system. In July 1984, the IEA's governing board adopted the Coordinated Emergency Response Measures (CERM). This was a strategy for responding more flexibly and expeditiously in oil supply disruptions of the so-called "sub-crisis" variety, *i.e.*, those entailing a shortfall of less than 7 percent. The purpose of

CERM was to provide for a consultative process that could lead to coordinated stock draws in case of a relatively small oil shock. The preamble of the decision stated that the July 1984 procedures were an additional set of measures, designed to complement the existing IEP arrangements for responding to oil supply emergencies. In contrast to the treaty provisions, the CERM procedure remained ad hoc, non-binding and informal. Significantly, it included non-IEA members of the OECD in the consultative process, informally expanding the IEA's role as a demand-side, oil-regulating regime (Toner, 1987: 57).

We consider the CERM an example of informal governance because while the general procedure is codified, the actual terms of each action under the CERM – including, crucially, the amount of oil to be released, by whom, and to whom – is decided on an ad hoc and informal basis. The CERM has no clear doctrine for utilization. By contrast, the IEP allocation system has formal rules that stipulate the conditions under which oil reserves would be used, which states would release oil supplies from their reserves, and where those supplies would be delivered. Moreover, the choice to use the CERM procedure as opposed to the IEA's formal oil allocation system remains an uncodified, informal practice. According to the formal rules, the IEA member states could still use the formal oil allocation system (or even legally require that it be used), but in practice the member states do not do so.

Other IEA members had wanted to amend the IEA's emergency procedure even earlier, but it was the US change in beliefs that was decisive in determining both the timing and content of the shift from the IEP's oil allocation system to the CERM. In the aftermath of the 1979 oil crisis, the Italians submitted a series of proposals to the governing board to "shake the IEA out of its 'passivity' to become the 'solidarity and intervention tool it was intended to be'" (Toner, 1987: 48). The Americans were opposed to this shift, because under Reagan's leadership, the US government initially fully embraced free markets. In December 1981, the governing board adopted a compromise decision taking up some of Italy's proposals while also stressing the importance of market forces. At the same meeting, the US delegation submitted for the record a statement that they did not feel themselves committed in any way by this decision. The stock issue then largely disappeared from the IEA's agenda until 1984 (Toner, 1987).

Ultimately, in July 1984, the CERM got adopted by the IEA's governing board because of a changed understanding of the merits of an unbridled free market for oil trade, particularly in the United States. When the Reagan administration took office, its clarion call was "the market will handle it all," and it was generally opposed to the IEA's "interventionist" systems for joint stock-draw (Toner, 1987: 51-52; Martin and Harrje, 2005: 103). A series of developments in the early 1980s would change that belief, such as the escalating Iran-Iraq war in the Persian Gulf, the discussions on piping Soviet gas to Europe, and the poor performance of the United States in an IEA allocation system test, which "exposed the 'leave-it-to-the-market' philosophy to a certain extent of ridicule" (Toner, 1987: 53). The United States learned that leaving the international markets to set the oil price could be costly and they agreed to a new set of IEA rules to use strategic oil stocks in smaller oil supply distortions. While US structural power helps to explain why the other IEA member countries were willing to accept this new, parallel emergency scheme largely on US terms, power asymmetries alone are not sufficient to account for this shift to informal governance.

Evidence Item #2c: The IEA's broadening mandate. The third example of how changing causal beliefs led to informal governance is the way the IEA developed a set of policy practices in new issue areas, such as climate change. As discussed earlier, the IEA is increasingly focused on environmental policy and climate change. This simply would not have happened without the new information about climate change that did not exist in the 1970s, and the change in beliefs that accompanied that new information. Changing public beliefs about climate change led to domestic pressures on member states to act, and member states have found the IEA a convenient forum for action (or at least the appearance of action). While formally speaking, the treaty allows the agency to take on these matters without any formal changes to the IEP, the agency's broadening scope has gradually transformed it from an oil lender of last resort (as it was intended by the founding fathers) into a proactive policy advisor for its member states with regard to sustainable energy policies and engaging with non-member countries from across the globe.

Evidence Item #2d: The IEA's growing engagement with non-members. Today, the IEA has begun experimenting with closer collaboration with consumer countries beyond the OECD, such as China, India and Brazil, in ways that could not have been imagined by the drafters of the IEP treaty (Colgan, 2009). Representatives of these emerging countries have participated in ministerial meetings of the IEA's governing board, joint stock release exercises have been held between the IEA and non-member countries such as Thailand, and the IEA has even begun to conduct reviews of the energy policy of non-members such as China. During the latest IEA oil stock release in 2011, the IEA informally consulted China before making an announcement (Glick, 2011). Even though the 1974 treaty allowed for such practices, the outreach process itself has not been guided by any formal rule-book.

Importantly, these informal practices are strongly affected by changing causal beliefs about the IEA's need to engage non-members in order to achieve its operational goals, especially in responding to oil supply crises. The agency began to take its relationship with other energy-consuming countries more seriously only from the 1990s onwards.[25] In part, the collapse of the Soviet Union prompted the IEA to intensify its cooperation with Central and Eastern European countries. Yet there was also a much deeper reason underlying the IEA's heightened engagement with other consumers: a gradual realization of the *global* nature of energy developments and related environmental challenges. For example, in 1993 IEA ministers recognized "the significance of increasing global interdependence in energy" (Scott, 1995, p. 349). In 1974, the OECD member states constituted more than 70 percent of the world's total oil consumption; by 2010, that share had dropped to a little over 50 percent, and was continuing to decline. The rising importance of Asian oil consumers, especially China and Asia, only reinforced this lesson (Colgan, 2009).

Conclusion

We sought in this article to identify the mechanisms through which informal governance occurs, and apply them to the case of the IEA, which is different from the "usual suspects" that have hitherto received most attention in the informal governance literature (e.g. IMF or the EU). We found evidence consistent with the dominant hypothesis in the existing research, which suggests that informal governance arises as a way of resolving significant power asymmetries between the member states of an organization. However, we also suggest that power asymmetries alone are insufficient to explain informal governance. In the case of the IEA the level of informal governance has grown substantially over the years, but power asymmetries have not (US structural power within the IEA is more or less constant).

We proposed some additional factors that offer new insight on the dynamics of informal governance, at least at the IEA. One mechanism through which informal governance arises is when powerful states have a change in causal beliefs about the issue at hand, within the context of an organization that has significant formal structures which are not easily changed or avoided. A second mechanism is the presence of regime complexity, which generates both incentives and opportunities for informal governance. The IEA's embeddedness within a regime complex means that its goals and methods of operation are significantly affected by other institutional actors in the same issue space.

While this article concentrates on the IEA, it seems plausible that informal governance plays a major role in other organizations of the energy regime complex. OPEC, for instance, appears to function only loosely according to its own formal rules. The actual effectiveness of OPEC as a cartel has long been in question and recent evidence seems to point even more strongly against it (Colgan, 2013). Regardless, it is plausible that informal governance helps to explain its behavior. If OPEC is acting as a quasi-effective cartel, informal governance might contribute to its functioning: e.g., Saudi Arabia uses an informal, *de facto* method of enforcement to discipline other OPEC members, namely by increasing its oil production and thereby bring the global price of oil down (as it apparently did in the mid-1980s). If OPEC is not acting as a cartel, informal governance might play an even larger role, as members circumvent the organization's formal rules.

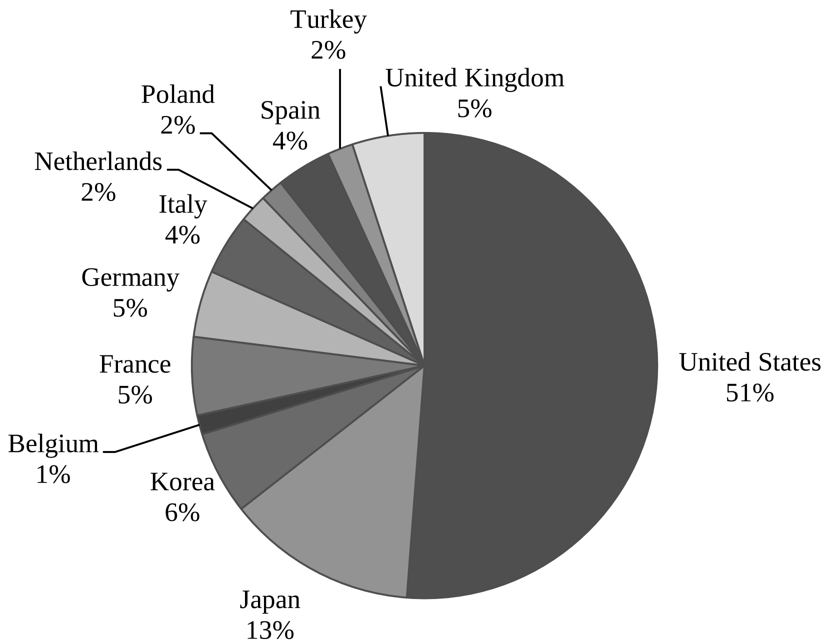
Much research remains to be done. We identified two key mechanisms in this article and probed their plausibility with respect to a single international organization. Future research might examine the operation of the identified mechanisms in other organizations. Moreover, additional research might explain the conditions under which informal governance conflicts with and undermines formal rules over time, and how those conditions might vary across different kinds of informal governance.

Table 1. Distribution of voting weights in the IEA's governing board

	General voting weights	**Oil consumption voting weights**	**Combined voting weights**
Australia	3	1	4
Austria	3	1	4
Belgium	3	1	4
Canada	3	4	7
Czech Republic	3	1	4
Denmark	3	1	4
Finland	3	1	4
France	3	6	9
Germany	3	8	11
Greece	3	0	3
Hungary	3	0	3
Ireland	3	0	3
Italy	3	5	8
Japan	3	14	17
Korea	3	1	4
Luxembourg	3	0	3
The Netherlands	3	1	4
New Zealand	3	0	3

Poland	3	1	4
Portugal	3	0	3
Slovak Republic	3	0	3
Spain	3	2	5
Sweden	3	2	5
Switzerland	3	1	4
Turkey	3	1	4
United Kingdom	3	5	8
United States	3	43	46
Totals	**81**	**100**	**181**

Figure 1. Emergency oil stocks made available during the 2011 IEA action[26]



[1] For Stone (2011), informal governance emerges from the interaction of three sources of power: structural power, formal control, and informal influence.
[2] Our research design does not allow us to identify sufficient conditions for informal governance because we focus on mechanisms, not variables (discussed below). Still, our work contributes to a proper explanation of informal governance by providing a richer understanding of the processes by which it occurs, and therefore goes significantly beyond considerations of power asymmetry alone.
[3] CERM stands for Coordinated Emergency Response Measures. It is an instrument outside of the IEA treaty that provides a rapid and flexible system of response to actual or imminent oil supply disruptions (cf. infra).
[4] This implies that informal governance can be more pervasive in the functioning of international organizations than is often assumed. For example, one study claims that the leading state only overrides formal rules in exceptional circumstances and that "modes of formal and informal governance are robust and exist side by side, rather than that informal governance eclipses formal governance or renders it insubstantial" (Stone, 2011: 21). Yet, in part, the informal governance practices that we observe in the case of the IEA are the product of general consent rather than infrequent derogations of formal rules to please the leading power.
[5] Note that formal governance is thus only a component of the standard definition of regimes, defined as "explicit or implicit principles, norms, rules, and decision-making procedures around which actor expectations converge in a given issue-area" (Krasner, 1982: 185).
[6] See also the special issue of *Review of International Organizations* on the topic of informal governance (June 2013).
[7] Our assumption here is that pursuing cooperation through an existing institution is a lower-transaction-cost option for states than striking out on their own. Even if states take the latter exit option, however, their choice to "go it alone" might soon result in the creation of a new institution for cooperation among like-minded states. Thus the next time they seek to pursue their goals, the regime complex will have grown thicker, creating more options – which brings us back to the argument made above.
[8] Our argument is consistent with those who have suggested that uncertainty facilitates informal governance (Lipson, 1991; Whytock, 2005; Eilstrup-Sangiovanni, 2009). However, these scholars typically refer to the uncertainty that states have about future events or about other actors' preferences, such as whether states will be able to keep their trade commitments should a major recession arise. We include such instances of "shallow" uncertainty, but emphasize "deep" uncertainty in the form of changes of beliefs about the nature of the underlying issue/problem and how it can be addressed. The likelihood of a disruptive recession is shallow uncertainty; a change in the belief that free trade brings net benefits to the country is deep uncertainty.
[9] One might argue that such institutional change is not truly informal governance, because a new set of practices have been adopted (*i.e.*, a new equilibrium has been reached). Yet a reasonable definition of informal governance should surely encompass a situation in which the formal rules of governance remain in effect (via treaty or organizational agreement), even as actors are behaving according to an uncodified set of rules and procedures.
[10] The IEA currently has 28 member states.
[11] This requirement was initially 60 days of net oil imports, and later raised to the current level of 90 days.
[12] Interestingly, the IEP does not provide for formal sanctions. However, participating countries that fail to meet their obligations would be denied benefits (i.e., oil allocations) under the agreement (Keohane, 1978: 935), which serves as a powerful potential enforcement mechanism.
[13] The concept of "structural power" was originally put forward by Strange (1994).
[14] As of November 16, 2012. http://www.fe.doe.gov/programs/reserves/spr/spr-facts.html.
[15] For anecdotal evidence of US insistence on releasing stocks in 2011, see: John M. Broder and Clifford Krauss, "Global Oil Reserves Tapped in Effort to Cut Cost at Pump," *New York Times*, June 23, 2011. *The Economist*'s Schumpeter blog (23 June 2011) opined that "Cynics are suggesting that Barack Obama is keener than most [other IEA members] to tap the stockpiles."
[16] Examples are: *Energy Use in the New Millennium: Trends in IEA Countries* (2007), *Energy Technology Perspectives* (2008), and *Deploying Renewables: Principles for Effective Policies* (2008).
[17] "l'AIE … est aujourd'hui *de facto* le secrétariat du G8 en matière d'énergie" (Keppler, 2007). Also see Lesage *et al.*, 2010.
[18] Personal correspondence with William C. Ramsay, former Deputy Executive Director of the IEA, June 4, 2010.
[19] *Ibid.*

[20] For more information on the reasons for IRENA's creation, see Van de Graaf (2013).
[21] Stefan Nicola, "A Solar Revolution at the IEA," *European Energy Review*, 4 June 2010.
[22] Note that the Governing Board can also increase the number of votes available to allocate, for example when new members accede to the IEA. However, in practice this ensures that positions remain relatively fixed: countries with existing voting weights are unlikely to re-allocate their power to other members of the organization.
[23] More precisely, South Korea would gain 6 votes and Spain 3 votes, whereas the United States would lose 3 votes, the United Kingdom would lose 5 votes, and Canada would lose 4 votes (Colgan *et al.*, 2012).
[24] The three stock releases the IEA has done so far have been done in an informal manner, not according to the rules and procedures laid out in the IEP Agreement.
[25] Even though the 1974 IEP treaty called on the IEA to promote consultation and dialogue with non-members, it took the agency nearly twenty years to establish a Committee on Non-Member Countries. This Committee was eventually created in 1990. It replaced the Standing Group on Relations with Producer and other Consumer Countries, which was instituted by the IEP treaty (articles 44-48 and 58) but had not met since 1977 despite these formal provisions (Scott, 1994).
[26] http://iea.org/files/Breakdowncollectiveaction.pdf

References

Abbott, Kenneth W and Duncan Snidal (2000) 'Hard and soft law in international governance', *International Organization* 54(3): 421–456.

Bagwell, Kyle and Robert W. Staiger (1990) 'A Theory of Managed Trade', *The American Economic Review* 80(4): 779–795.

Bamberger, Craig S. (2004) *IEA, the first thirty years: The history of the International Energy Agency, 1974-2004*, Paris: IEA/OECD.

Betts, Alexander (2009) 'Institutional Proliferation and the Global Refugee Regime', *Perspectives on Politics* 7(1): 53-58.

BP (2011) *Statistical Review of World Energy*. Available from: http://www.bp.com/statisticalreview.

Bradley, Curtis A. and Judith G. Kelley (2008) 'The Concept of International Delegation', *Law and Contemporary Problems* 71(1): 1-36.

Bush, Marc L. (2007) 'Overlapping Institutions, Forum Shopping, and Dispute Settlement in International Trade', *International Organization* 61(4): 735-761.

Chakarova, Vessela P. (2010) 'Energy crises and cooperation: Do international institutions matter?' Old Dominion University. http://gradworks.umi.com/34/07/3407610.html.

Christiansen, Thomas and Simona Piattoni, eds. (2003) *Informal Governance in the European Union*, Cheltenham: Edward Elgar.

Christiansen, Thomas and Christine Neuhold, eds. (2012) *International Handbook on Informal Governance*, Cheltenham: Edward Elgar.

Cogan, Jacob K. (2009) 'Representation and power in international organization: The operational constitution and its critics', *American Journal of International Law*, 103: 209.

Colgan, Jeff D, Robert O. Keohane and Thijs Van de Graaf (2012) 'Punctuated equilibrium in the energy regime complex', *The Review of International Organizations*: 1–27.

Colgan, Jeff D. (2013) 'The Emperor Has No Clothes: The Limits of OPEC in the Global Oil Market', forthcoming in *International Organization*.

——— (2009) 'The International Energy Agency', *GPPI Policy Paper Series* (6).

Conant, Melvin A. (1982) *The Oil factor in US foreign policy, 1980-1990*, Lexington, MA: Lexington Books.

Downs, George W. and David M. Rocke (1995) *Optimal imperfection? Domestic uncertainty and institutions in international relations*, New Jersey: Princeton University Press Princeton.

Downs, George W., David M. Rocke, and Peter N. Barsoom (1996) 'Is the Good News About Compliance Good News About Cooperation?', *International Organization* 50(03): 379–406.

Drezner, Daniel W. (2009) 'The power and peril of international regime complexity', *Perspectives on Politics* 7(1): 65-70.

Eilstrup-Sangiovanni, Mette (2009) 'Varieties of cooperation: Government networks in international security'. in Miles Kahler, ed. *Networked Politics: Agency, Power, and Governance*, 194-227, Ithaca, N.Y.: Cornell University Press.

Emerson, Sarah A. (2006) 'When should we use strategic oil stocks?' *Energy policy* 34(18): 3377–3386.

Gehring, Thomas and Sebastian Oberthür (2009) 'The Causal Mechanisms of Interaction between International Institutions', *European Journal of International Relations* 15: 125-156.

Gielen, Dolf (2008) *Energy Technology Perspectives*, Paris: International Energy Agency.

Glick, Devin (2011) 'A Look at the IEA 2011 Release of Strategic Oil Reserves', Actuelles de l'IFRI, July 2011, available at: http://www.ifri.org/downloads/glickfinalisbn.pdf.

Goldstein, Judith and Robert O. Keohane (1993) 'Ideas and Foreign Policy: An Analytical Framework', in Judith Goldstein and Robert O. Keohane, eds. *Ideas and Foreign Policy: Beliefs, Institutions, and Political Change*. Cornell: Cornell University Press.

Green, Jessica, and Jeff D. Colgan (2013) 'Protecting Sovereignty, Protecting the Planet: Delegating Authority in Global Environmental Politics', *Governance* 26(3): 473-497.

Hawkins, Darren G. et al. (2006) *Delegation and Agency in International Organizations*, Cambridge: Cambridge University Press.

Helfer, Laurence R. (2009) 'Regime shifting in the international intellectual property system', *Perspectives on Politics* 7(1): 39-44.

Helfer, Laurence R. (2012) 'Flexibility in International Agreements', in Jeffrey Dunoff and Mark A. Pollack, eds. *Interdisciplinary Perspectives on International Law and International Relations: The State of the Art*. Cambridge, Cambridge University Press, 175-196.

Helmke, Gretchen and Steven Levitsky (2004) 'Informal institutions and comparative politics: A research agenda', *Perspectives on Politics* 2(04): 725–740.

Hirschman, Albert O. (1970) *Exit, Voice, and Loyalty: Responses to Decline in Firms, Organizations, and States*, Cambridge, Mass.: Harvard University Press.

International Energy Agency (2007) *Energy Use in the New Millennium: Trends in IEA Countries*, Paris: OECD/IEA.

——— (2008) *Deploying Renewables: Principles for Effective Policies*, Paris: OECD/IEA.

Kapstein, Ethan B. (1990) *The Insecure Alliance: Energy Crises and Western Politics Since 1944*, Oxford: Oxford University Press.

Kelley, Judith (2009) 'The more the merrier? The effects of having multiple international election monitoring organizations', *Perspectives on Politics* 7(1): 59-64.

Keohane, Robert O. (1984) *After Hegemony: Cooperation and Discord in the World Political Economy*, Princeton: Princeton University Press.

——— (1982) 'The demand for international regimes', *International Organization* 36(02): 325–355.

——— (1978) 'The International Energy Agency: State influence and transgovernmental politics', *International Organization* 32(04): 929–951.

Keppler, Jan Horst (2007) 'Energy Interdependence in a Multi-polar World: Towards a Market-based Strategy for Safeguarding European Energy Supplies', *Reflets et perspectives de la vie économique* (4): 31–48.

Kissinger, Henry (1982) *Years of Upheaval*. Little, Brown and Company.

Kleine, Mareike (2010) 'Making Cooperation Work: Informal Governance in the EU and Beyond', *Paper presented at the 2010 Annual Meeting of the American Political Science Association, September 2-5*, Washington, D.C.

——— (2013) 'Knowing Your Limits: Informal Governance and Judgment in the European Union', *Review of International Organizations* 8(2): 245-264.

Koremenos, B., Charles Lipson and Duncan Snidal (2001) 'The rational design of international institutions', *International Organization* 55(4): 761-799.

Koremenos, Barbara (2005) ‘Contracting around International Uncertainty’, *The American Political Science Review* 99(4): 549–565.

Krasner, Stephen D. (1982) ‘Structural causes and regime consequences: regimes as intervening variables’, *International organization* 36(2): 185–205.

Lesage, Dries, Thijs Van de Graaf, and Kirsten Westphal (2010) *Global Energy Governance in a Multipolar World*, Farnham: Ashgate.

Lipson, Charles (1991) ‘Why are Some International Agreements Informal?’ *International Organization* 45(4): 495–538.

Little, Daniel (1991) *Varieties of social explanation: An introduction to the philosophy of social science*, Boulder, Westview Press

Mabro, Robert (2006) *Oil in the 21st century: issues, challenges and opportunities*. Oxford University Press.

Martin, William F. and Martin Harrje (2005) ‘The International Energy Agency’, in *Energy and Security: Toward a New Foreign Policy Strategy*, 97–116. Washington, D.C: Woodrow Wilson Center Press.

Pevehouse, John, Timothy Nordstrom and Kevin Warnke (2004) ‘The Correlates of War 2 international governmental organizations data version 2.0’, *Conflict Management and Peace Science* 21(2): 101–119.

Raustiala, Kal (2002) ‘The Architecture of International Cooperation: Transgovernmental Networks and the Future of International Law’, *Virginia Journal of International Law*.

Raustiala, Kal and David G. Victor (2004) ‘The Regime Complex for Plant Genetic Resources’, *International Organization* 58(02): 277–309.

Rosendorff, B. Peter and Helen V Milner (2001) ‘The optimal design of international trade institutions: Uncertainty and escape’, *International Organization* 55(4): 829–857.

Schwartz, Warren F. and Alan O Sykes (2002) ‘The Economic Structure of Renegotiation and Dispute Resolution in the World Trade Organization’, *J. Legal Stud. S179* 31.

Scott, Richard (1995) *The History of the International Energy Agency, 1974-1994: IEA, the First 20 Years*, Paris: OECD/IEA.

Shaffer, Gregory C. and Mark A Pollack (2010) ‘Hard vs. Soft Law: Alternatives, Complements, and Antagonists in International Governance’, *Minnesota Law Review* 94(3): 706–799.

Stone, Randall W. (2011) *Controlling institutions: International organizations and the global economy*, Cambridge: Cambridge University Press.

——— (2013) ‘Informal governance in international organizations: Introduction to the special issue,’ *Review of International Organizations* 8(2): 121-136.

Toner, Glen (1987) ‘The International Energy Agency and the development of the stocks decision’, *Energy policy* 15(1): 40–58.

Vabulas, Felicity and Duncan Snidal (2013) ‘Organization without delegation: Informal intergovernmental organizations (IIGOs) and the spectrum of intergovernmental arrangements’, *Review of International Organizations* 8(2): 193-220.

Van de Graaf, Thijs and Dries Lesage (2009) ‘The International Energy Agency after 35 years: Reform needs and institutional adaptability’, *Review of International Organizations* 4(3): 293–317.

Van de Graaf, Thijs (2013) ‘Fragmentation in global energy governance: Explaining the creation of IRENA’, *Global Environmental Politics* 13(3): 14-33.

Verdier, Daniel (2012) ‘The Choice Between Formal and Informal Governance in the Areas of Currency and Trade: A Two-Level Approach’, Paper presented at the 5th Conference on the Political Economy of International Organizations (PEIO) at Villanova University, January 26-28, 2012.

Whytock, Christopher (2005) 'A Rational Design Theory of Transgovernmentalism: The Case of EU-US Merger Review Cooperation', *Boston University International Law Journal*, 23(1): 1-53.

Yu, Peter K. (2007) 'International Enclosure, the Regime Complex, and Intellectual Property Schizo-phrenia', *Michigan State Law Review* 1: 1–33.