

Principals, Agents, and Public Goods: Information and Structural Complexity in Policy Implementation Systems

Prepared for the 47th Annual International Studies Association meeting¹

March 22-25, 2006

San Diego, California

Ken Cousins

Department of Government and Politics

3140 Tydings Hall

University of Maryland

College Park, MD 20740

kcoutins@gvpt.umd.edu

Although non-state market-driven (NSMD) policies are increasingly promoted as more efficient and effective alternatives to state-based regulation, there have been few comparative studies of the two approaches, and none that focus on their relative reliability as a means of policy delivery. To facilitate comparison of state and non-state policy systems, I develop a comparative framework that highlights key structural features expected to produce slippage (i.e., a divergence of principals' expectations and agents' actions). Integrating new insights from principal-agent theory with formal network analysis, I emphasize internal structural factors that can be expected to impact communication between policymakers those to whom they delegate implementation responsibilities (i.e., structural complexity). I apply this framework to compare two state forest laws and two NSMD systems currently operating in Chile (FSC and CertFor). I conclude that although the NSMDs in Chile appear on the surface to present improvements over state regulation, an important NSMD instrument (the chain-of-custody) weakens their expected reliability as means of implementation. This suggests we may be replacing governmental systems of safeguarding public goods (however flawed) with alternatives that are likely to be less effective in the long run.

¹ **Note:** This essay has been excised from a more elaborate and much longer doctoral dissertation, the full text of which is available from the author.

A common misconception is that government is the only source of regulation. In fact, trade associations and other private organizations also administer regulation. Private regulation may arise in response to the threat of government regulation or as a spontaneous private solution to a market imperfection. For example, private organizations are often effective at providing regulation to overcome informational problems through standard setting, certification, monitoring, brand approval, warranties, product evaluations, and arbitration.

Council of Economic Advisors 2003, p 145

Forest certification programs have presented the world of policy analysis with one of the most provocative and startling institutional designs since governments the world over first began addressing the impacts of human activity on the natural environment.

Cashore et al., 2004, p 219

Over the past fifteen years, non-state approaches to public policy have been a growing trend across a range of industries (Haufler 2001). In the late 1980s, civil society groups, frustrated with what they saw as a lack of progress in national and international policymaking, began to seek out commercial partners interested in developing independent regulatory approaches (Donovan 1996; Elliott 1999). This was paralleled by increasing globalization of both production and consumption (Linton 2003). At the same time, domestic and international regulatory regimes began to shift away from “command and control” instruments and started promoting voluntary, market-based regulatory systems (IISD 1996; Bernstein 2001; Potoski and Prakash 2002). One result was the emergence of forest certification – a non-state market-driven (NSMD) approach to governance – which derives policymaking authority not from the social contract that underlies state institutions, but from stakeholder involvement and market demand (Cashore 2002; Cashore, Auld, and Newsom 2004a). Such approaches have often been presented as solutions to policy “gridlock,” inefficient or inappropriate state-based policies, and otherwise inadequate or inappropriate responsiveness to public concerns (e.g., de Bruijn and Norberg-Bohm 2001; Albrecht 2002; Council of Economic Advisors 2003).

Yet this devolution of regulatory responsibility is proceeding without knowledge of how non-state implementation designs compare to state-based systems as instruments of policy delivery. Political analysis of NSMD systems has largely been limited to policy formulation stages (e.g., Elliott 1999; Elliott and Schlaepfer 2001; Lindahl 2001), expected socioeconomic (e.g., Markopoulos 2001; Ozinga 2001; Cerda and Lira 2002) and environmental effects (e.g., Washburn and Block 2001; CCIF 2002), and general shifts in the foundations of policymaking legitimacy (e.g., Cashore et al. 2001; Cashore 2002).

By comparison, my approach emphasizes structural challenges inherent in the way these systems – and the state policies they may displace, or replace – are designed and implemented. Inasmuch as NSMD systems mimic the regulatory functions of state-based institutions, it is important that we understand how these new patterns of authority and delegation differ. Since such approaches have often been promoted as alternatives to state-based policies² (at least in a

² Errol Meidinger describes these non-state policy systems as “parallel regulation,” with the potential to “augment, displace, or conflict” with state-based regulation (2000, p 232).

preemptive sense) (Sheppard 1999; Arnold 2003), it is crucial that we understand the ability of NSMDs to reliably achieve their stated purposes.

My goal is to estimate the structural capacity of alternative approaches to reliably achieve policy objectives (including both state-based and non-state regulation), with a case study of Chilean forestry. To accomplish this, I first identify two minimal conditions for reliable oversight: formally defined delegation between principals and agents (*determinacy*), and the absence of clear conflicts-of-interest between such actors (*political breadth*). These conditions ensure that policies reflect the goals of policymakers, rather than those whose behavior the policies are intended to influence. My remaining hypotheses are based on the assumption that we can expect such error to be compounded as instances of communication increase in number (i.e., *structural complexity*). Regardless of their institutional basis (i.e., state, non-state, or hybrid), it should be possible to compare regulatory systems according to these constitutive and internal structural properties.

I ultimately conclude that while the non-state policy systems considered here appear to offer dramatic improvements over state institutions in terms of internal structural complexity, such advantages are likely illusory, due to the necessity of maintaining label integrity throughout global market chains. Regardless of whether it is the demand of end-consumers or intermediate firms which ultimately drive these systems, we should expect the scope and scale of global markets to make the task of connecting supply and demand more complicated than regulation at the national level. While it may be possible to combine the best of state and non-state regulatory approaches (e.g., by contracting monitoring to private firms and strengthening citizen oversight provisions), it seems that informed (and therefore reliable) market demand is principally a local phenomenon. Efforts to achieve sustainable resource use through ecolabeling are only likely to succeed where it is possible to minimize or mitigate structural distance between producers and consumers.

1.1 NON-STATE MARKET-DRIVEN POLICIES

Whether following from globalizing or liberalizing trends, non-state policy efforts are increasingly common today (Haufler 2001; Potoski and Prakash 2002). It is now well-known that non-state regulation occurs – and has occurred for centuries – across a broad range of domains (Haufler 1998; Cutler, Haufler, and Porter 1999). From credit scoring to product safety and kosher food, the private sector has a long history of establishing and enforcing commercial standards (Yilmaz 1998). Yet private regulation of environmental and labor standards is a relatively new phenomenon (Bartley 2003), which only began to emerge at the global scale after the Brundtland Commission touched off broad public discourse on the role of economic actors in environmental and social sustainability (Bernstein 2001). Over the past two decades, a responsible public image – especially towards the environment – has come to be seen as critical to developing, maintaining, and expanding marketshare (Diamantopoulos et al. 2003).

Though few issues have been fully resolved, several policy elements have come to be seen as *de facto* requirements for legitimate NSMD policies. First, such systems must support goals that are in demand by actors downstream from producers, who are rewarded when their product is preferred over others. Second, participation must be entirely voluntary, occurring without state coercive power. Third, authority to develop and implement such systems is grounded in stakeholder participation. Fourth, compliance with policy standards must be independently verified (Cashore 2002; Cashore, Auld, and Newsom 2003). Finally, to ensure that

consumers are able to identify participating producers, product labeling and chain-of-custody systems have become standard instruments (RPPI 1996; Teisl and Roe 1998; Cason and Gangadharan 2002).

Proponents of NSMD approaches often claim these systems are more efficient than “command and control” state regulation (e.g., Campbell 1997; Teisl and Roe 1998; Russell and Clark 2003). This is said to follow from the ability of producers and consumers to choose between alternative means of achieving policy goals (Council of Economic Advisors 2003). Many have claimed that this greater flexibility even means that NSMD policies are also ultimately more effective than state regulation. Combined with the normative appeal of the greater freedom offered by their voluntary nature, these advocates have even suggested that public regulation – from resource management, to food and drug safety, airline safety, financial ratings, and medical licensing – be replaced by private sector, market-driven approaches (Campbell 1997; Yilmaz 1998; Murphy and Bendell 1999; Schwarcz 2002b, a; Holcombe 2003). Lest we believe this represents only the radical fringe, even President Bush’s Council of Economic Advisors has promoted private regulation, albeit with somewhat more restraint³ (2003).

1.2 WHY THIS CASE STUDY MATTERS

Though it has been claimed that forestry has the potential to “become the first industrial system that can meet the need for food, raw materials and energy within sustainable systems” (Wergens 1995), concern about the state of the world’s forests has been growing since the 1970s. At the same time, the global nature of the forest products market, and institutional changes at the international level (e.g., trade agreements), have made forest companies less dependent on – and less constrained by – the policies of any single government (Palo, Uusivuori, and Mery 2001). In response, forestry was one of the earliest domains in which the newer non-state regulatory approaches were developed (Hoberg 1999); such systems now account for hundreds of millions of acres of managed forests worldwide (UNECE/FAO 2001). Forest certification has generally led the NSMD approach in terms of both innovation and lessons learned (Viana et al. 1996); in fact, the FSC system has been called the “most advanced example of NSMD governance worldwide” (Cashore and Lawson 2003, p 6). What we learn from forest certification may therefore tell us a great deal about the feasibility of NSMD approaches that are being developed in other areas, such as coffee, agriculture, and fisheries (Cashore, Auld, and Newsom 2004b).

In many ways, Chile provides a nearly test-tube environment to study the political economy of natural resources. For more than three decades, the country has been a leading example of neo-liberal economic reforms (Tanzi and Schuknecht 1997), and its civil service has been renowned for its low level of corruption (Maggi and Kern 2000). As a major international producer of wood-based products, Chilean forestry has drawn a great deal of attention from civil society organizations, industrial interests, and academic and professional scientists, as well as politicians, state ministries, and international institutions (Kaimowitz 1996). In response, its largest commercial forestry companies have come to support forest certification as a means of providing more stringent standards and improving the competitiveness of Chilean products in international markets. This has resulted in two competing NSMD standards – the Forest

³ While suggesting that issues as sensitive as homeland security might rely (in part) on private regulation, the Council has also been careful to acknowledge some limits of private approaches, such as shallow markets.

Stewardship Council (FSC) and CertFor Chile – which have collectively certified more than half of Chile’s commercial forest estate (CONAF 2004; CertFor 2006; FSC 2006). Since certification systems with independent oversight and a label-based chain-of-custody are considered the “gold standard” of NSMD systems – characteristics shared by both non-state systems analyzed here – these provide a strong case for the non-state market-driven approach to public goods provision (Wartelle 2002; Cashore, Auld, and Newsom 2004c). If they cannot be shown to be structurally equivalent to (or improvements upon) state regulation, we must question the general effectiveness of the NSMD model. Where this must be qualified by contextual factors (e.g., market structures, market strategies), we should similarly understand the limits of these systems as alternative means of ensuring public goods.

1.3 REGULATORY INSTITUTIONS AS SOCIAL NETWORKS

Most American political scientists (and legal scholars) have traditionally seen regulatory power as the exclusive purview of state institutions. Theodore Lowi has described regulatory policies as rules “formulated by some governmental authority expressing an intention to influence the behavior of citizens, individually or collectively, by use of positive and negative sanctions” (1985, p 70). Yet this “technical” definition is too restrictive, as it limits our focus to state institutions alone (Haufler 2001). In his 1980 classic on regulatory theory, Barry Mitnick offered a more general definition: “Regulation is a process consisting of the intentional restriction of a subject’s choice of activity, by an entity not directly party to or involved in that activity” (p 9). By remaining agnostic as to the institutional basis of such authority, such an understanding remains open to the possibility that non-state actors may promulgate and implement regulation. It also emphasizes the necessity for separation between regulator and regulatee, and allows us to determine what sort of acts are not regulatory in nature: unintentional acts; those which fail to restrict a subject’s choice⁴; and those performed by 1st-party actors (ibid.).

Another fundamental way to consider regulation is as a relationship between a *principal* and an *agent* in which the latter is encouraged (through incentives and/or sanctions) to act to support the goals of the former (Mitnick 1980). Such relationships exist wherever demands of time, knowledge, or expertise lead individuals or organizations to designate others to act on their behalf, as when employers hire employees, legislatures assign implementation duties to executive agencies, or standards-setting bodies require that auditors verify compliance. The necessity for principals to delegate – to agents who possess information unavailable to those principals – is considered one of the fundamental dynamics in political life (Lowi 1985; Eisenhardt 1989).

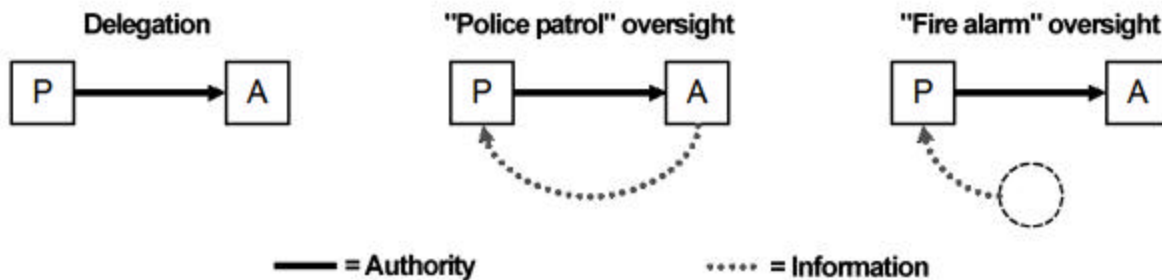
In the early 1980s, Barry Mitnick and Terry Moe each published seminal works that brought these concepts into the mainstream of political science (see Mitnick 1980, 1982; Moe 1984). Mitnick, in particular, is credited for first interpreting regulatory theory in the language of principals and agents (Worsham 2003). By identifying such relationships between *those who rule* and *those who implement*, agency theorists have attempted to explain how authority and accountability have been institutionalized across a broad range of contexts (Eisenhardt 1989; Sinclair 1999).

⁴ Non-regulatory actions include statements of mere sentiment, which may “express a desired end but embody no rule” (Lowi 1985, p 70).

The most fundamental feature of the principal-agent relationship is the act of delegation – without it, such a relationship cannot be said to exist (Lyne and Tierney 2002). Wherever social organizations exist, we find delegation: employers hire workers, and both legislatures and private standard-setting bodies enact policies that must be implemented by others (Bergman, Müller, and Strøm 2000). Agents often possess information that is unavailable to principals – known as *information asymmetry* – a key concept in principal-agent theory (Waterman and Meier 1998). By contrast, *slippage* describes differences between the preferences of principals and the actions of agents, regardless of cause⁵ (Hawkins and Jacoby 2002). Slippage may be caused by information asymmetry, but can also happen because principals and agents have different preferences⁶ (known as *shirking*) (McCubbins 1985). Such *goal conflict* (also known as *divergent preferences*) is usually assumed to be an outgrowth of rational utility maximization⁷. These three factors (delegation, informational asymmetry, and goal conflict) form the core of the principal-agent framework, “the spark plugs that power the theory” (Waterman and Meier 1998, p 177).

A central task of institutional design is developing monitoring systems capable of reducing informational asymmetries with minimal effort (Moe 1984). The simplest oversight model is the direct observation of agent behavior by the principals themselves (see Figure 1). Known as “police-patrol” oversight, such monitoring is “centralized, active, and direct” (McCubbins and Schwartz 1984, p 166). Since agents know that any deceptive behavior would likely be discovered, shirking is reduced. Yet while this method can be very effective, it is also the most costly (Pollack 1997). The alternative is to rely on third-parties (e.g., stakeholders) to monitor and report on agents’ actions (e.g., “whistleblower” or citizen-oversight provisions). This so-called “fire-alarm” oversight is less centralized and active than police-patrol monitoring (McCubbins and Schwartz 1984).

Figure 1: Delegation and Oversight



By acknowledging the importance of third-party participation in principal-agent models, we open the door to a more empirically grounded understanding of delegation and control

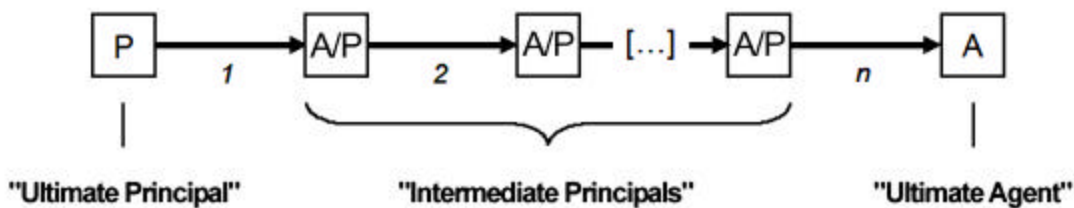
⁵ Both McCubbins (1985) and Goldstein and Lenway (1989) have argued for limiting the definition of slippage to problems induced by institutional design (e.g., decisionmaking instability). However, I feel it is more accurate to consider slippage as a general effect, caused by both institutional and personal (e.g., deception) factors.

⁶ By contrast, Hawkins and Jacoby (2003) defined slippage as “pursuing different goals under cover” (i.e., deception), and shirking as “sleeping on the job,” but offered no explanation why the latter should not be considered merely a form of deception (p 16).

⁷ On the other hand, Waterman and Meier (1998) have persuasively argued that assumptions of goal conflict and asymmetric information should be treated as variables, rather than be merely assumed.

(Nielson and Tierney 2003). While most principal-agent theories are based on simple dyads (Laffont 1994), hierarchies usually consist of many more actors, and often multiple chains of command (Evans 1975; Spaeth 1985). Indeed, these ubiquitous organizational features (see Figure 2) can be found in political, economic, and military institutions throughout history. While coordinating multiple actors is a fundamental political challenge, even if all actors willingly cooperate (Olson 1965; Downs 1997), the potential for slippage persists. One cause can be found in the limits of communication – error can be expected to increase as the number of actors grows⁸, as any child who has played the game *Telephone* knows⁹. Even if we were to assume perfect goal agreement among actors, and even if principals take care to elicit the “right” forms of information from agents, we may still find slippage between the preferences of the ultimate principal and the actions of the ultimate agent (i.e., policy target)¹⁰ (Baber, Houghton, and Cowton 1999; Goodin 2003).

Figure 2: Delegation Chains



Such *sequential complexity* is not the only way that organizational forms can complicate matters. Recently, theorists have begun to pay more attention to the problem of “common agency,” where principals (e.g., bureaucracies) face internal collective action problems, in addition to the issue of slippage. A single layer of delegation may include multiple principals (e.g., balance of powers systems), or principals may be “corporate” or collective entities (i.e., composed of more than one actor) (see Figure 3). *Collective principals* have resolved their internal collective action problems (forming a single contract with the agents to whom they delegate), but *multiple principals* produce multiple contracts (Lyne and Tierney 2002; Nielson and Tierney 2003). While theorists now recognize the potential for principals to compete for influence over agents (Cooley and Ron 2002; Worsham 2003), few have acknowledged the potential of such “parallel complexity” to produce slippage, even in the absence of power politics. As with delegation chains, we could also expect some degree of “noise” when multiple

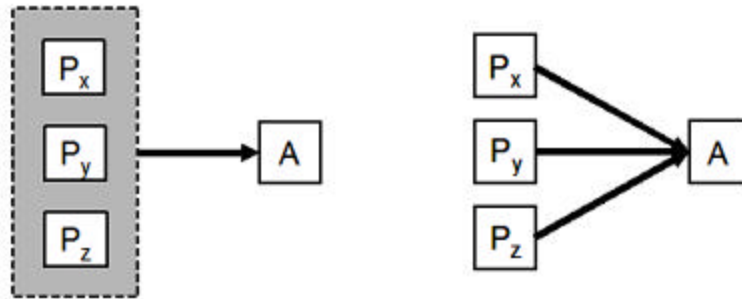
⁸ Social psychologist Frederic Bartlett called this dynamic “serial reproduction,” and attributed it to psycho-cultural factors, by which actors interpret communication in terms that are the most familiar to themselves (1997). Network theorist Barry Wellman has generalized this effect as what he calls “transfer” or “brokerage” costs (1988, p 42).

⁹ This game is known by quite a few names (e.g., “Chinese Whispers,” “Post Office,” “Share the Secret”). Children sit in a circle, and one whispers a story in the ear of her neighbor, who whispers it to his neighbor and so on, until the story passes around the circle. The first and last stories never match (Krauss, Nake, and Grabowski 2001). There are surprisingly few scientific studies of this effect (e.g., Talland 1956; Bartlett 1997; Kashima 2000; Lyons and Kashima 2003), though it is very common to see the concept referenced as a potential weakness of communications (e.g., Rodenstein and Donath 2000; Macnamara 2004) and management systems (e.g., Baker et al. 2002; Barner-Rasmussen and Bor 2005).

¹⁰ Indeed, this dynamic is identical to the classic “control-loss” challenge, as originally defined by Williamson (1967), though his approach focuses on intra-firm dynamics.

principals communicate “simultaneously” with agents. Even if multiple principals have identical preferences, information loss should still be expected across each contractual “link” (as with delegation chaining), due to variations in how (and what) each principal communicates to the agent (Krauss, Nake, and Grabowski 2001).

Figure 3: Collective and Multiple Principals



(adapted from Nielson and Tierney, 2003: 248)

Thus, there can be structural sources of slippage that can be expected, regardless of our assumptions about preference divergence¹¹ (Waterman and Meier 1998). While simple delegation systems (i.e., those with shorter chains of unitary actors) can be expected to face “restrictive” principal-agent challenges (e.g., adverse selection, moral hazard) (Lyne and Tierney 2002), more complex systems (i.e., those characterized by some combination of longer delegation chains and multiple principals) are still prone to slippage. This is because complexity produces additional limitations, due to information losses (i.e., noise), that can be expected to increase along with the number of agents in general (Nielson and Tierney 2003). By adopting more complex models of principal-agent relationships, we may come to better understand the origins of slippage, outside of any normative claims about actor motivation (Lyne and Tierney 2002).

While modeling such complexity would be extremely difficult using conventional econometric approaches, it is a relatively easy task to map structural relationships using graph theory or social network methods (Wasserman and Faust 1999; Scott 2004). Authority (or perhaps more accurately, delegation) can be understood as a directional relation between two actors, as can the information transfers mandated within a given policy system¹² (Wellman 1988). Consider for instance, the hypothetical delegation system represented in Figure 4. Since **a** is connected through delegation to other actors, but is not itself the “recipient” of any such relation, it can be considered the *ultimate principal*. Similarly, since **e** receives, but does not originate any delegation relations, it can be considered the *ultimate agent* or *target*¹³ (Moe 1984).

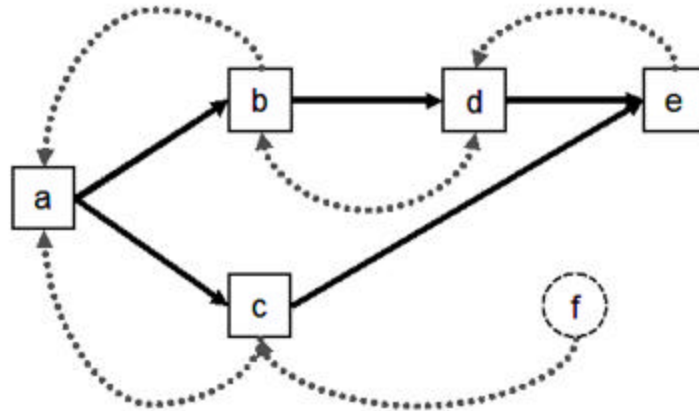
¹¹ In fact, such an assumption can be quite unrealistic – the existence of “iron triangles,” or collusion between regulators and regulated interests, is a common feature of large, dispersed bureaucracies (Laumann and Knoke 1987).

¹² This interpretation is somewhat problematic, since communication is also implicit in the act of delegation (i.e., the demands of the principal). Despite this, I believe this formulation is still capable of highlighting critical dynamics in implementation networks.

¹³ Ironically, in graph theoretic terms these two positions are known as *root* and *leaf*, respectively (Black 1998).

Actors **b**, **c**, and **d** are intermediate principals, serving dual roles as both the recipients and sources of delegation relationships. Since **f** is a source of information, but not party to any delegation relation, it represents an instance of fire-alarm oversight. Notice also that **a** delegates directly to two actors (**b** and **c**), producing two delegation chains of differing length (**abde** and **ace**).

Figure 4: Systemic Delegation



1.4 NETWORK HYPOTHESES

The first (and most critical) hypothesis concerns the issue of *determinacy*. Policies that fail to clearly identify the roles and responsibilities of each implementing agent are unlikely to achieve their nominal objectives (Schneider 1987; Calvert, McCubbins, and Weingast 1989; Wood and Waterman 1991). While shared norms and goals may provide a basis for consensus and informal policies (Schneider and Ingram 1997; Sinclair 1999), voluntary actions become governance systems only through obligation. Such “commitment rules” guarantee that short-term self-interest does not exclude shared interests (Cutler, Haufler, and Porter 1999, p 368). Voluntary acts, while possibly contributing to policy effectiveness overall, cannot be said to be prescribed by a given policy. Since there can be no regulatory relationship without delegation (Mitnick 1980; Lyne and Tierney 2002), such roles must be describable in terms of principals and agents. Therefore, **for a policy to be expected to produce consistent and reliable outcomes, all implementation roles must be describable in principal-agent terms**¹⁴.

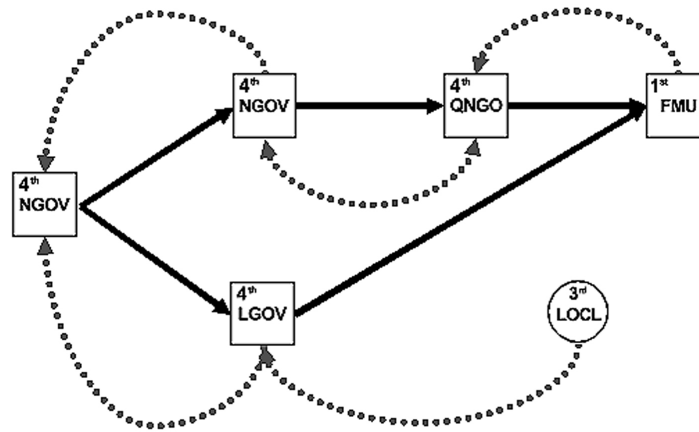
Though certification systems are increasingly common, there are broad differences in the way these policies have been designed and implemented. For some, authority is retained solely by the firms themselves (*1st-parties*); for others, industrial associations take the lead (*2nd-parties*). A few derive their authority from more traditional sources, such as states and international regimes (*4th-parties*) (Garcia-Johnson, Gereffi, and Sasser 2000). However, as certification systems have competed for consumer support, there has been a general trend towards the use of independent, non-state agents (*3rd-parties*) to certify compliance (Centeno 1996; Garcia-Johnson, Sasser, and Gereffi 2001), though the importance of this feature has been hotly debated (Okubo 1999; SAF 1999). This “*nth-party framework*,” loosely grounded in the theory of common law, is

¹⁴ Such roles are often stipulated within the relevant policy mandate or contracts, but some pre-existing relationships between actors are implicit (e.g., Executive branch hierarchies are not explained in each law passed by Congress).

widely known and used by both state and non-state policymakers (e.g., Cabarle and de Freitas 1995; Darby 1998; Bourke and Wijewardana 1999; Mater et al. 1999).

Embedding this taxonomy within a network framework (see Figure 5) provides a richer picture of the relationships between principals and agents, and suggests additional sources of structural slippage. Where the *political breadth* between a principal and an agent is small – understood here as a dyad between 1st and 2nd-parties – we can expect the possibility of collusion to be greater. Indeed, this is one of the classic criticisms levied against 2nd-party certification systems (Taylor 1958). Accordingly, **for a policy to be expected to produce consistent and reliable outcomes, there can be no direct delegation between 1st and 2nd parties.**

Figure 5: Delegation System with n^{th} -party Actors



Ceteris paribus, structural slippage is likely to increase with the number of delegation relationships (Lyne and Tierney 2002; Nielson and Tierney 2003). This phenomenon occurs regardless of the magnitude of goal conflict or underlying informational asymmetry. As delegation chains grow longer (i.e., sequential complexity) or multiple principals delegate to the same agent (i.e., parallel complexity), informational constraints can only compound other factors (e.g., shirking). If two or more implementation systems share such characteristics, it is difficult to attribute differences in their performance to structurally induced slippage. Similarly, we might assume that variations in the structure of implementation networks allow us to rank alternative policies according to their likelihood to produce consistent and reliable outcomes.

Such structural properties are easily calculated from graphical representations of implementation networks. To determine the level of *sequential complexity*, we simply count the number of links in the longest path between any ultimate principal and ultimate agent¹⁵. Other paths may exist between the same actors, but our goal is to compare policies in their entirety, rather than the individual instruments contained within a given policy scheme. For example, the maximum sequential complexity of Figure 4 is three (**abde**). *Ceteris paribus*, a policy is as

¹⁵ Since hierarchies are *directed networks*, paths are defined by (and limited to) the directional flow of a given relation (Wasserman and Faust 1999). As described earlier, Figure 4 has two paths (i.e., delegation chains), one of three links (**abde**) and another of two (**ace**). In graph theory, this metric is known as the *diameter* or *height* (Black 1998).

likely to produce consistent and reliable outcomes as a given alternative only if its sequential complexity is no greater than that of the alternative system

Parallel complexity is similarly easy to determine. Since the most elemental unit of delegation is a dyad between principal and agent, wherever multiple principals produce multiple contracts with the same agent (i.e., agents receiving more than one delegation link), we simply sum the total number of additional delegation links received by such agents. Thus, Figure 4 reveals a parallel complexity of one (both **c** and **d** delegate to **e**). *Ceteris paribus*, a policy is as likely to produce consistent and reliable outcomes as a given alternative, only if its parallel complexity is no greater than that of the other policy system.

Modeling complex implementation systems in formal network terms facilitates the identification of two structural features (sequential and parallel complexity) that can be expected to produce slippage (variance between principals’ expectations and agents’ actions), even when perfect goal agreement is assumed (i.e., in the absence of deceptive behavior). The degree to which these features occur in state-based or NSMD systems should thus qualify our support for either approach. In other words, for an implementation design to be considered functional equivalents (or improvements) to other approaches, it must satisfy each of these four hypotheses (see Table 1).

Table 1: Summary of Structural Hypotheses

<i>Ceteris paribus</i> , implementation systems could be said to be <i>structural equivalents</i> when:		
Determinacy	IFF: <u>All</u> implementation roles are describable as principal-agent relationships	H₁
Breadth (<i>n</i> th parties)	IFF: There is no direct delegation between 1 st and 2 nd -parties	H₂
Sequential complexity (delegation chaining)	IF: A policy’s sequential complexity is no greater than those of other alternatives	H₃
Parallel complexity (multiple principals)	IF: A policy’s parallel complexity is no greater than other alternatives	H₄

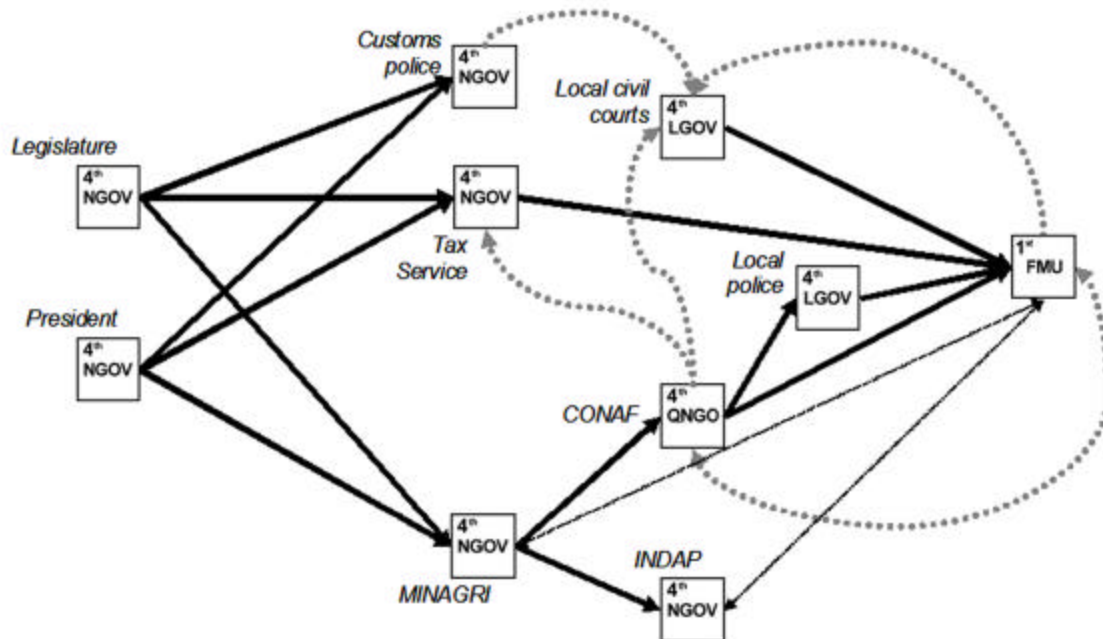
1.5 CHILEAN STATE FORESTRY POLICIES

If regulations to protect individual species and locales are included, Chile has hundreds of forest laws (Gallardo 2000). However, only two are considered relevant to commercial forestry today: D.L. 701 (from 1974, reformed in 1998 as D.L. 19561), and Law 19300 (Chile’s version of NEPA, enacted in 1994) and associated bylaw D.S. 30 (Arnold 2003). By far the most significant state policy affecting Chile’s forest sector is D.L. 701 and associated¹⁶ laws, regulations, and amendments (Hartwig 1991). Designed primarily as an incentive system to expand the country’s forest estate, D.L. 701 also established guidelines for the management of both native forests and plantations (Silva 1997). It was reformed in 1998 – to encourage greater participation by small

¹⁶ It is common practice in Chile to refer to subsequent reforms by the name of the original law. Thus, the 1998 reforms are still referred to as D.L. 701. However, this leads to a disconcerting grammatical shift – the early version of D.L. 701 is properly described in the past tense, but post-1998 reforms are clearly present-tense. To improve the readability of this section, I will refer to the reforms as D.L. 19561, although elsewhere I adopt the more common practice of referring to both laws jointly as D.L. 701.

and mid-sized forestry companies – as D.L. 19561 (Quiroga 1996), but the new law retains D.L. 701’s instrumental features (see Figure 6)¹⁷.

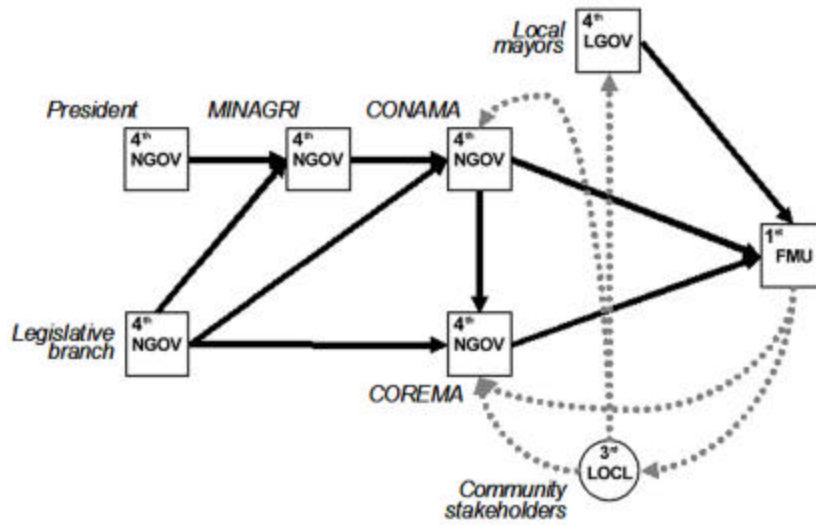
Figure 6: D.L. 701 / 19561



The success of the United States in pressuring Mexico to negotiate environmental side agreements before the 1993 passage of the North American Free Trade Agreement “sent a clear message to other Latin America nations” (Silva 1994). It was partly in response to such pressures that Chile’s Comprehensive Environmental Law 19300 was adopted the following year (LALBR 1997). Based loosely on the United States’ NEPA, the *Ley de Bases* (“Framework Law”, Decree Law 19300) was designed to address a broad range of environmental problems. Most of D.L. 19300 builds on the principles of prevention, economic efficiency, and “polluter pays” (Silva 1996; O’Ryan and Fierro 2000). Although the law emphasizes pollution prevention and remediation, it also intends to safeguard the “quality and quantity” of renewable natural resources.

¹⁷ Again, the regulatory networks depicted in this essay are described and annotated in great detail in my dissertation, from which this essay has been excised. Anyone interested in reading the full text of that manuscript may contact me directly: kcousins@gvpt.umd.edu.

Figure 7: D.L. 19300 / D.S. 30



1.6 FOREST CERTIFICATION IN CHILE

In 1990, the Rainforest Alliance’s SmartWood program issued the world’s first forest management certificate, to an Indonesian company (Donovan 1996). In October 1993, the *Forest Stewardship Council* (FSC) convened its founding assembly in Toronto (Elliott and Donovan 1996); over 130 participants from 25 countries attended (Upton and Bass 1996). After a Secretariat was established in Oaxaca the following August, the membership approved the FSC’s original statutes, principles and criteria (FSC 2003). As the first global-scale NSMD governance system, the FSC has led the movement for stakeholder-based standards, with compliance verified by third-party assessors (Counsell 1999).

Certification was first mentioned in Chilean public media in April 1994, just over six months after FSC’s founding. In November of 1997, the Director of SmartWood was invited to Chile to present a seminar on certification and the sustainable management of native forests (Chile Forestal 1997). Within six months, the Chilean NGO CODEFF¹⁸ had organized a Working Group to develop national FSC standards (FSC 1999). Known as the *Iniciativa Chilena de Certificación Forestal Independiente* (ICEFI), it includes more than thirty Chilean NGOs, institutions and businesses (Otero and Maluenda 1998; Schlegel and Echeverria 2001b).

Initially, Chilean industrial leaders resisted the idea of forest certification, believing that any demand for certified products was limited to a few environmental groups, an insignificant consumer block (Gayoso 2002). However, after Home Depot established Chilean offices and declared a “no old-growth timber” policy in 1999 (Bond 1999), industry’s position softened. Certification (in the general sense) came to be seen as a means of protecting or expanding

¹⁸ CODEFF (*Committee for the Defense of Flora and Fauna*) is Chile’s oldest environmental organization, founded in 1968 (CODEFF 2005). As its name implies, CODEFF is principally concerned with problems that emerge from the exploitation of Chile’s natural resources.

Chilean marketshare in North American and European markets¹⁹ (Lignum 2001b; CertFor 2002b). By late 1999, the forest industry was publicly promoting the idea of certification (Estrategia 2000; El Sur de Concepción 2002). Perhaps not coincidentally, Chile and the United States entered bilateral trade talks that same year (USTR 2002).

The Chilean industry's solution – following the lead of their counterparts in Northern countries – was to develop and promote an alternative program, to compete directly with the FSC. In the first days of 2001, the CertFor Working Group was officially formed (CertFor 2001). Thus, there are currently two NSMD approaches competing for “marketshare” within the Chilean forest industry: FSC and CertFor Chile. It has been claimed that both emerged as alternatives to persistent impasses in state-based policy processes. Rather than face a perpetual stalemate in public fora, it was agreed that forestry “should be regulated by private agreements between resource owners and social interest groups, without additional legal restrictions of property rights” (Arnold 2003, p 323, citing interviews with Fernando Raga and Hernán Verscheure)²⁰. Today, Chile is among the world's leading countries, in terms of the proportion of productive forests under some form of certification (Raga 2002).

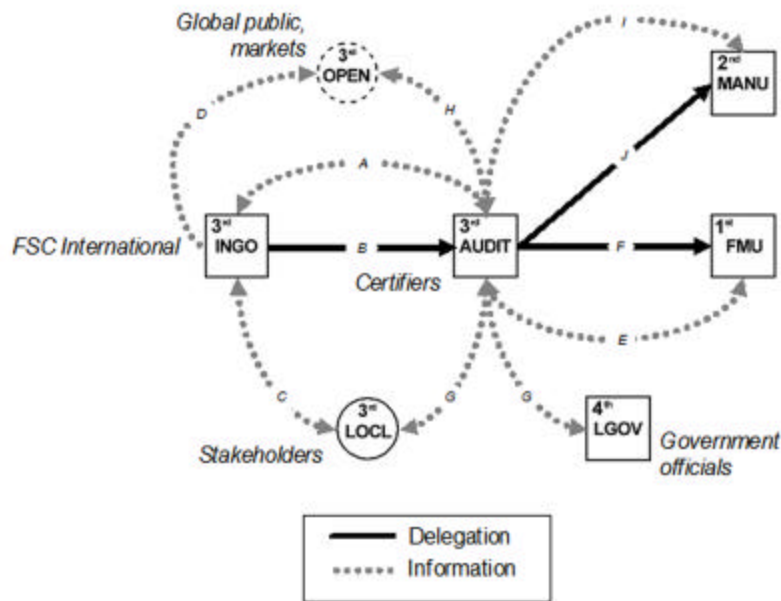
1.6.1 The FSC System

FSC implementation (see Figure 8) has three basic components: certifier accreditation; forest management unit (FMU) certification; and chain-of-custody (COC) certification. The accreditation and FMU certification systems are each designed to guarantee that forest managers follow FSC Standards, through monitoring by licensed third-party auditors (Crossley 1996). When a forest company (FMU) wants to become certified, they apply directly to an accredited certification body, who contacts local stakeholders during field assessments. Following the assessment (which may last several days), the lead auditor prepares a final audit report, which must be reviewed by the applicant and by the certifying firm's management, which has final approval authority. Once an assessment is approved, a public summary report must be prepared by the certifier. Certified FMUs must be annually monitored to verify compliance with FSC Standards; certificates are valid for five years, after which the FMU must undergo another full audit.

¹⁹ The United States is Chile's largest single market, thirty-seven percent (US\$622 million) of the country's forest exports (Lignum 2003b).

²⁰ Raga is the Development Manager for Forestal Mininco and Vice President of CORMA (the dominant forest industry association), both of which have been strong supporters of the CertFor process.

Figure 8: The FSC System



COC-certification is similar, though field audits focus on the applicant’s record keeping and materials management systems, to ensure that certified and non-certified materials are not “co-mingled” or inaccurately labeled. As with FMU certification, the lead auditor prepares the final audit report, which is then reviewed by the certifying firm’s management. Once an assessment is approved, a public summary report must be prepared by the certifier. Like FMU certificate holders, COC firms must be audited annually to verify compliance with COC Standards and with any certification conditions.

1.6.2 The CertFor System

Once Chile’s commercial forestry industry began to seriously consider the environmental concerns of its destination markets (it was estimated that market losses could reach US\$122 million), they began searching for solutions that could give them an alternative to FSC processes (CORFO 2001; Schlegel and Echeverria 2001a). Though its governance structure differs, CertFor also emphasizes environmental, social, and economic values in its approach (CertFor 2001; Cerda 2003). The standard “aspires to perfect the way in which plantations are managed” (Miranda 2002, p 42), but most of all, CertFor’s founders wanted to create a locally controlled standard that would be internationally recognized, and thus serve to protect Chile’s markets in North America and Europe (Lignum 2001b; CertFor 2002a).

Over the latter half of 2000²¹, Fundación Chile, INFOR, CORMA, and CORFO worked to form a working group to define national standards for plantation management (CertFor 2001; Lignum 2001a). The project was officially launched on January 5th, 2001 (CertFor 2001). Until

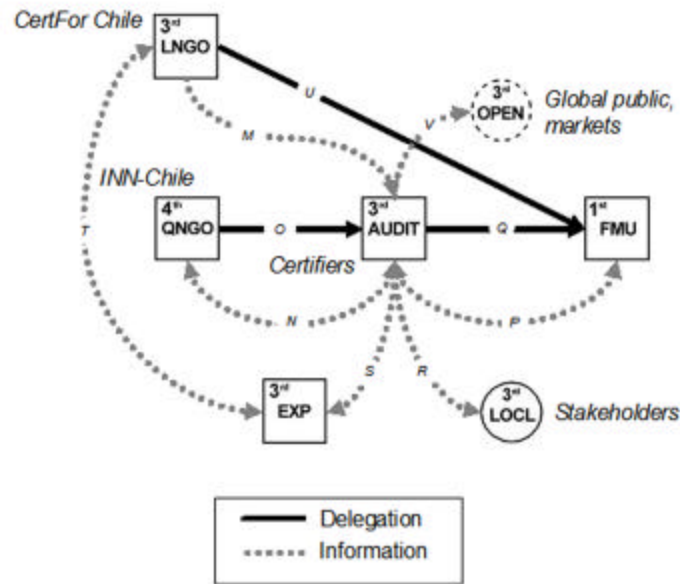
²¹ Though not publicly identified as such until April, CertFor had been in development for at least a half-year, with CORFO funding approved the September before, and the project’s Superior and Technical Councils chosen in October and December, respectively (Morales 2003).

CertFor signed an accreditation agreement with INN in July of 2004, the Superior Council assumed the authority to license certifiers.

Like the FSC, CertFor also implements its system through three basic processes, though these differ somewhat: auditor accreditation; certifier accreditation; and FMU and COC certification, both of which share the same procedural design (see Figure 9). To ensure that auditors are competent and follow CertFor Standards, both individual auditors and certification firms are accredited. As with the FSC, FMUs wishing to label their products must apply for joint FMU-COC certification (CertFor 2004a), although unlike the FSC, these processes – though not the standards applied – are identical.

CertFor auditor accreditation process begins when an applicant completes a five-day Auditor Training, held periodically by CertFor personnel. To be accredited, a person then sends an application to the CertFor Executive Director, who reviews their qualifications and experience, then forwards the application to the CertFor Superior Council for approval. Once the CertFor Superior Council approves, the auditor’s name is placed on CertFor’s list of accredited auditors, which is sent to accredited certification firms. Rather than handle certifier accreditation directly, CertFor has contracted this task to INN, whose auditors perform field assessments with each applicant firm (CertFor 2004a). If no corrective actions are required, INN sends an accreditation contract to applicant firm. To ensure that certifiers are complying with all INN and CertFor policies, INN assessors monitor the accredited firms annually.

Figure 9: The CertFor System



Forest owners and manufacturers who wish to be certified under the CertFor system contact an INN-accredited firm, which conducts stakeholder consultation and a field audit, after which the lead auditor drafts an assessment report, which is submitted along with stakeholder consultation reports to a peer review panel. The reports are then sent to the CertFor Superior Council, which holds the ultimate authority to issue certificates. Once the certifier issues a certificate, they delete any confidential information and make the report available upon request to stakeholders. To ensure that the certificate holder is complying with CertFor standards,

certificate holders are monitored annually. CertFor certificates are valid for up to five years, after which a new Main Assessment is required (CertFor 2004a).

1.7 COMPARING IMPLEMENTATION DESIGNS

Having graphed the rules, roles, and responsibilities of both public and private forest policy in Chile, we are now ready to compare structural aspects of these implementation designs. Earlier, I defined two minimal conditions for a policy to be considered regulatory: clear lines of delegation (i.e., *determinacy*) (Calvert, McCubbins, and Weingast 1989; Schneider and Ingram 1997), and separation between principals and agents (i.e., *political breadth*) (Mitnick 1980). Since all of the policy systems under consideration here (see Figures 6, 7, 8 and 9) can be graphed²², it appears that the condition of determinacy has been met by each. Similarly, since we can see from the graphs that no 1st to 2nd-party delegation relationships are found in any of the policies considered here, each of these systems appears to exhibit sufficient political breadth.

Even where goal conflict is not evident, slippage is likely to increase with the number of delegation relationships in a delegation system (O'Donnell 1952; Pressman and Wildavsky 1984). Since this constraint can only be expected to compound other factors, it does not matter whether goal conflict actually exists – *ceteris paribus*, a policy is likely to be as reliable as other alternatives, only if its sequential complexity is no greater than that of the alternative systems. As we see in Table 2, Chile's state forestry regulation appears to exhibit the greatest sequential complexity. For D.L. 701/19561, this path leads from either the legislature or president, through the Ministry of Agriculture, to CONAF, local police, and finally the policy targets, individual forest management units (FMUs). For D.L. 19300 / D.S. 30, the longest path follows from the legislature through the Ministry of Agriculture, to CONAMA, the regional COREMAs, and on to individual FMUs (see Figure 4.3). Although links between the legislature, the president, and the Ministry of Agriculture are shared by both policies, the level of sequential complexity is not changed when both policies are considered together.

Table 2: Structural Complexity

Policy	Figure	Sequential	Parallel
D.L. 701 / 19561	6	4	6
D.L. 19300 / D.S. 30	7	4	5
All state forestry regulations		4	11
Forest Stewardship Council	8	2	0
CertFor Chile	9	3	2

Of Chile's two NSMD systems, CertFor exhibits slightly greater sequential complexity, as found in the paths from the CertFor Secretariat to INN, certification firms, to either FMUs or chain-of-custody firms. In addition to exhibiting the lowest apparent sequential complexity, the

²² Of course, the level of analysis dictates the level of detail. Though each of these policies prescribes several *intra*-firm processes (e.g., internal review requirements), I did not graph such features, since the focus on *delegation* led me to choose institution-institution (i.e., firm-firm) dyads as the relevant level of observation.

FSC system appears to have the fewest delegation relationships overall, from the FSC Secretariat, to certification firms, to either FMUs or COC firms.

Slippage can also be expected to emerge when contracts are established between multiple principals and a single agent (i.e., *parallel complexity*), whether or not goal conflict is assumed (Lyne and Tierney 2002; Nielson and Tierney 2003). As with sequential complexity, we can expect “noise” (e.g., differences in how policy goals are communicated) when multiple principals communicate “simultaneously” with agents. *Ceteris paribus*, a policy is as likely to produce reliable outcomes as alternatives, only if its parallel complexity is no greater than that of other policy systems.

As Table 2 shows, parallel complexity appears to vary much more than sequential complexity, though again we find that state regulation shows the greatest complexity. While there is little difference in the number of multiple principal relationships found in each of the two state policies, they each exhibit dramatically more parallel complexity than either NSMD approach, even when each is considered in isolation. Such differences are even starker when both state regulations are combined, as parallel complexity is cumulative²³ across policy systems (unlike sequential complexity). Of the two NSMD systems, CertFor also appears to exhibit slightly more parallel complexity, though the direct relationships between the CertFor Secretariat and its policy targets may actually be designed to reduce any slippage caused by the serial complexity of that system. While the temporal sequence of relationships between principals and agents in the CertFor system may serve to minimize the impact of such complexity (the only link between the Secretariat and policy targets is the final decision to grant a certificate), such multiple-principal relationships are completely absent in the FSC system.

1.8 A CRITICAL CAVEAT: SEQUENTIAL COMPLEXITY AND INFORMATION

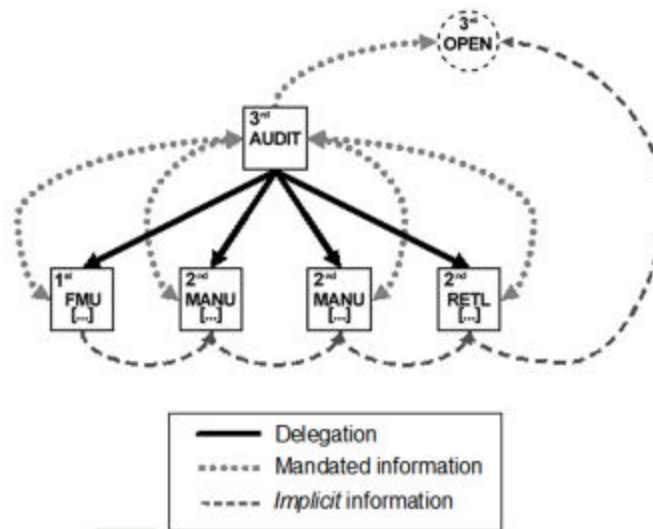
Thus far, the non-state approaches in Chile appear to be clear improvements over state forest policies in structural terms – both NSMD systems seem to exhibit lower sequential and parallel complexity. If we were to judge the relative merits of state and non-state approaches based on this evidence, we could reasonably conclude that the latter are more likely to be capable of producing reliable outcomes. However, there are good reasons to believe that such conclusions might be premature. As market-driven labeling systems, both FSC and CertFor include a chain-of-custody instrument, designed to assure both consumers and producers that only products from certified forests bear their labels (CertFor 2004b; FSC 2004). While the minimal features of these instruments were graphed in Figures 8 and 9 (as described by the policy documents of each system), chain-of-custody systems for commodities are likely to be much more complex in practice (Dickson 2001).

Consider how the chain-of-custody is expected to function: reliable connections between producers and consumers require every processor, manufacturer, wholesaler and retailer that purchases certified materials must also be certified (see Figure 10). The requirements for chain-of-custody firms are generally simpler (e.g., auditable material-streams), but without a COC certificate, firms cannot sell their products as certified (Egestad 2001; Borregaard et al. 2002). In structural terms, this means that although delegation chains between Secretariats, certifiers, and applicant firms remain relatively short, the informational chains may in fact be quite long – an

²³ Since relationships between the legislature, the president, and the Ministry of Agriculture are shared by both policies, we need only account from them once.

alternative source of *sequential complexity* that has generally been ignored. Since participation in non-state systems is voluntary, the magnitude of such complexity will vary according to the economic strategies of the participants. Thus, the *voluntariness* of non-state policy introduces a degree of *indeterminacy* to any NSMD system, a factor that appears to be especially problematic for chain-of-custody instruments. Maintaining the chain requires each actor to enter contracts with certified suppliers *and* purchasers – each of which must have also entered contracts with the same certification system²⁴. **In policy systems where participation is voluntary, and global commodity markets where production chains may in fact be quite long, chains-of-custody are likely to be both indeterminate and sequentially complex.** Moreover, such instruments would appear to substantially increase transaction costs over either market processes or state-based regulatory approaches alone. If the effectiveness (or persistence) of NSMD systems depends on maintaining auditable linkages between producers and consumers, such structural factors may in fact nullify any improvements that such approaches may offer over state-based implementation.

Figure 10: Chain-of-Custody Mechanisms



These results echo many of the concerns that have been raised in the past about the reliability of private regulation (Vrieling and Brandsen 2004). Even before the newest wave of NSMD policies, scholars pointed to the critical importance – yet tenuous nature – of information in market-driven systems (Parkinson 1975; Laric and Sarel 1981). The tendency for extended market chains to erode communication has also been highlighted (e.g., Princen 1997, 1999; Fuchs and Lorek 2002). Thus, while NSMD approaches may be successful at national or regional scales, they are much less likely to produce consistent feedback at the global level. *Ceteris paribus*, we would expect NSMD systems to be most successful where distance between producers and consumers can be minimized.

²⁴ Although some certification systems have signed “mutual recognition” pacts (e.g., PEFC and CertFor), supporters of other forest certification approaches (e.g., FSC) have strongly resisted this approach.

For some goods, lower structural distances may be achieved through direct marketing, though this is likely only feasible for higher value goods (e.g., doors and moldings²⁵). For those of lower value (e.g., roundwood, lumber²⁶), such constraints are more likely to be significant. This is supported by the global distribution of certified producers; the FSC has been most successful at gaining marketshare in Europe, where most certified producers are also found (Thornber 1999, 2003). More distant producers – where the challenge of sustainable forest management is arguably more critical – have been disadvantaged in those markets (Cashore, Auld, and Newsom 2004c). While this may not be entirely attributable to the structural complexity of market chains, the evidence I present here suggests that such factors should be of concern to those seeking to promote environmental and social sustainability via market forces.

This suggests that if we want NSMD approaches to apply to a significant proportion of global production, markets must either be predominantly local²⁷, or substantially concentrated²⁸. It may be possible to reduce asymmetries through direct marketing (i.e., effectively shortening COC chains), but it is clear that in the Chilean context, structural complexity affects both state and market-based institutions, but sequential complexity is much more likely to impact the latter. Thus, complexity and scale are likely to limit to the ability to achieve sustainability via either market and state-based regulatory approaches.

While the non-state systems operating in Chilean forestry offer clear advantages in terms of parallel complexity, assuring both citizens and consumers may require the state to retain policymaking and licensing authority, as well as liberal use of “fire-alarm” oversight. An approach that has been successfully implemented in neighboring Bolivia is to establish state standards that are equivalent to NSMD alternatives in terms of stringency, but which exempt forest companies from government oversight if they have been certified by a state-recognized non-state system (Jack 1998; Taylor II, Nittler, and Kraljevic 2002). In at least some national contexts²⁹, it may be possible to design hybrid systems to combine the best of both approaches: the more established policymaking authority of state institutions, and the leaner implementation structures of non-state systems (Koppell 2003).

²⁵ Andersen Windows and Alexandria Moulding, two of the largest international wood products manufacturers in Chile, have both announced FSC-only purchasing policies, to the irritation of those in the Chilean industry who do not actively support FSC certification (El Mercurio 2003; Lignum 2003a).

²⁶ *Roundwood* are unprocessed logs, while *lumber* (also known as *sawn wood*) has been milled to standardized dimensions (Dykstra and Heinrich 1997).

²⁷ Ensuring global-scale public goods through localized markets faces the persistent problem that neither capital nor demand are evenly distributed. Indeed, it is the wealth and higher consumption of the US, Europe, and East Asia (rather than their proximity) that have made them Chile’s most important markets.

²⁸ Of course, concentration increases the potential for other well-known problems, both economic and political. Bottlenecks of either supply (monopoly) or demand (monopsony) tends to produce market distortions (Princen 1997; Milward 1998), and disproportionate economic power has long been associated with disproportionate political power (Dahl and Lindblom 1953).

²⁹ This option is available to Bolivian lawmakers because most forestland is owned by the state, and leased to logging companies. The model is much less feasible in Chile, where productive forests (and tree plantations) are overwhelmingly in private hands, and the constitution strongly emphasizes private property rights.

1.9 GOVERNANCE INSTITUTIONS OF STATES AND CIVIL SOCIETY

While the choices and strategies of individual actors may significantly affect outcomes for both state-based and NSMD policies³⁰, all must contend with the structural factors I have described here. In developing this framework, I have been careful to avoid assumptions about actors' motivations – indeed, we would expect structural complexity to be a constraint even if every actor were perfectly altruistic. Similarly, I have generally ignored the possibility that individuals may have different decisionmaking capacities – or abilities to act upon those decisions – either of which may also significantly impact policy outcomes. Instead, I have focused on factors that have been formally (and endogenously) defined in the constitutive documents of each policy. This framework is capable of comparing very diverse institutions, but also establishes some of the baseline conditions by which agency is constrained.

Although I have remained neutral as to the “rational” or “self-interested” behavior of participants, the formal nature of this framework should accommodate a variety of rational choice perspectives (Waterman and Meier 1998), even as it provides a more nuanced and empirical understanding of how complex institutions are designed. This should also lead to more realistic theories of principal and agent dynamics at the systemic level (Lyne and Tierney 2002; Lyne, Nielson, and Tierney 2003). Indeed, despite claims by Bendor et al. that any study of principals and agents beyond the dyadic relationship is “excess baggage” (2001, p 236), I believe that I have offered proof that macro-structure can matter.

Inasmuch as we expect *structural complexity* to negatively impact the transfer of information, this framework could also be interpreted as an extension of the concept of *bounded rationality* to formal regulatory systems. In fact, elements of this approach are implicit in Williamson's studies of hierarchy and optimal scale (1967; 1970) and explicit in Princen's work on “shading and distancing” in global markets (1997). However, by supporting a more empirically grounded understanding, my framework should offer greater resolution on the root causes of suboptimal outcomes, whether they stem from these structural factors, or from strategic behavior³¹. Moreover, because it allows for the participation of non-state and hybrid actors in policy implementation, it enables comparison of state, non-state and hybrid policy designs – at least in terms of delegation, oversight, and related structural characteristics at the systemic (and sub-systemic) level. This not only helps to ground our discussion of both state and non-state policies, it allows us to move beyond the metaphorical use of the term “regulatory” to describe many non-state system dynamics. Indeed, by applying this network-based, principal-agent framework to other regulatory forms – and experimenting with a variety of assumptions about actors' capacities and motives – we should be able to extend current theories of regulation in new directions.

Whether we consider these NSMD systems as simply the latest examples of private governance (Sasser 2001; Falkner 2003), or as nascent examples of an emergent international “soft law” (Walter 2003; Bernstein and Cashore 2004), they present dramatic innovations to the

³⁰ As I have already explained, the choice of whether to participate in voluntary systems affects the *determinacy* of each system, and strategies such as direct marketing may reduce *sequential complexity*. More generally, *slacking* and other forms of deception may also seriously impede the effectiveness of any policy forms.

³¹ Lyne et al. contrast the structurally induced problems of multiple principals (i.e., *parallel complexity*) with the “ordinary agency losses” attributable to goal divergence or deception (2002, p 9; 2003, p 7).

means of policy delivery (Cashore, Auld, and Newsom 2004c) This is especially the case for regional and global (i.e., transnational) public goods, of which the environment is one of the clearest examples (Sonnenfeld and Mol 2002). Though the benefits of such goods often transcend national boundaries, the cost of sustaining them is primarily borne locally. This presents widespread incentives to free-ride on the efforts of others, and thus a persistent source of institutional and market failure. This holds true for both state and market actors, each of which often face incentives to externalize costs in pursuit of greater competitiveness (Goodwin and Harris 2001; Revesz 2001). Indeed, most of the new-era NSMD policies have been promoted as means to reduce such failures, even while increasing efficiency and ultimately, policy effectiveness.

Where states have failed to establish strong and effective policies, civil society organizations have come to work directly with economic interests to develop non-state means to regulate responsible behavior (Haufler 2001; Cashore 2002). Yet while non-state, market-driven systems may increase the alternatives available to those concerned with sustaining public goods, they may reduce options in other areas. Economic actors have been known to pursue non-state initiatives as a means of pre-empting state regulation (Sheppard 1999; Arnold 2003); in fact, many proponents of private regulation have proposed such approaches as part of a broader privatization of economic and social regulation (e.g., de Bruijn and Norberg-Bohm 2001; Albrecht 2002; Council of Economic Advisors 2003). Given the problems of indeterminacy and sequential complexity, it is difficult to see how NSMDs can reliably serve as means of ensuring public goods at the global level. This is problematic, since devolving regulatory functions away from state institutions affects the state's future capacity. The ability to discipline economic actors relies on maintaining the countervailing power currently derived from both governmental and civil society actors (Haufler 2001); indeed, we may find it more difficult (and possibly more costly) to re-regulate at a later point than to shore-up or reform current state capacity.

Because independently monitored certification with a label-based chain-of-custody – features of both the FSC and CertFor systems – are considered the gold standard of NSMD governance (Wartelle 2002; Cashore, Auld, and Newsom 2004a), we may assume that the factors impacting voluntary chain-of-custody instruments at the global scale (e.g., *indeterminacy* and *sequential complexity*) would likely be worse for other NSMD forms. Without independent monitoring and an auditable chain-of-custody, consumers are unlikely to place much trust in the claims of producers, manufacturers or retailers (Golodner 1997; Zadek, Lingayah, and Forstater 1998), but since extended market chains are so common in global commodities markets, we must question whether market-driven public policy is truly the panacea that so many of its supporters would have us believe (e.g., Campbell 1997; Yilmaz 1998; Schwarcz 2002b; Holcombe 2003).

For those public goods which transcend political boundaries, there are no easy answers. This is a different issue than whether we prefer a system of one dollar-one vote, or one person-one vote. Though how we define “the public” is as important as how we define the public good, there are also functional reasons why we might choose one approach over another. Based on the results of this research, we should expect neither state or non-state systems to perform well at scale. Regardless of whether we seek to sustain public goods by public, private, or hybrid means, we must expect slippage to increase along with institutional scale – especially the extended chains-of-custody associated with global markets. Given the evident importance of structural distance, it seems that establishing and maintaining reliable oversight (i.e., *watching the watchmen*) will very likely require us to *localize* control. To paraphrase the late House Speaker

Tip O'Neill, "all implementation is local" (1994). The same may be said of reliable oversight – and thus, effective regulatory policy – whether it is attempted by public or private means.

BIBLIOGRAPHY

- Albrecht, Johan. 2002. Environmental issue entrepreneurship: a Schumpeterian perspective. *Futures* 34:649-661.
- Arnold, Franz. 2003. Native forest policy in Chile: understanding sectoral process dynamics in a country with an emerging economy. *International Forestry Review* 5 (4):317-328.
- Baber, Chris, Robert Houghton, and Mal Cowton. 1999. WESTT: reconfigurable human factors model for network enabled capability: NATO.
- Baker, Thomas, Makx Dekkers, Rachel Heery, Manjula Patel, and Gauri Salokhe. 2002. What Terms Does Your Metadata Use? Application Profiles as Machine-Understandable Narratives. *Journal of Digital Information* 2 (2):65-75.
- Barner-Rasmussen, Wilhelm, and Sanne Bor. 2005. Language in multilingual organizations: a review of the management and organization literature. Paper read at 18th Scandinavian Academy of Management, at Aarhus, Denmark.
- Bartlett, Frederic C. 1997. *Remembering: a study in experimental and social psychology*. London: Cambridge University Press.
- Bartley, Tim. 2003. Certifying Forests and Factories: States, Social Movements, and the Rise of Private Regulation in the Apparel and Forest Products Fields. *Politics & Society* 31 (3):433-464.
- Bendor, Jonathan, A Glazer, and T Hammond. 2001. Theories of Delegation. *Annual Review of Political Science* 4 (1):235-269.
- Bergman, Torbjörn, Wolfgang C Müller, and Kaare Strøm. 2000. Introduction: Parliamentary democracy and the chain of delegation. *European Journal of Political Research* 37:266-260.
- Bernstein, Steven, and Benjamin Cashore. 2004. Non-State Global Governance: Is Forest Certification a Legitimate Alternative to a Global Forest Convention? In *Hard Choices, Soft Law: Combining Trade, Environment, and Social Cohesion in Global Governance*, edited by J. Kirton and M. Trebilcock. Aldershot: Ashgate Press.
- Bernstein, Steven F. 2001. *The Compromise of Liberal Environmentalism*. New York: Columbia University Press.
- Black, Paul E. 2005. *Dictionary of Algorithms and Data Structures* [Internet]. National Institute of Standards and Technology, June 2, 2005 1998 [cited October 2 2005]. Available from www.nist.gov/dads.
- Bond, Patti. 1999. Home Depot to halt selling scarce wood. *Atlanta Journal-Constitution*, August 27, 2.
- Borregaard, Nicola, Guillermo Geisse G, Annie Dufey, and Juan Ladron de Guevara. 2002. Green Markets: Often a Lost Opportunity for Developing Countries. *Trade Knowledge Network*. Winnipeg, Canada: International Institute for Sustainable Development.
- Bourke, I J, and D Wijewardana. 1999. The Relationship Between National-Level Forest Programmes and Certification Processes. Paper read at World Bank Alliance for Forest

- Conservation and Sustainable Use: Forest Certification / Verification Systems Workshop, November 9-10, at Washington, DC.
- Cabarle, Bruce, and A Ramos de Freitas. 1995. Timber certification and the pursuit of credible claims. *Unasylva* 183 (46):25-26.
- Calvert, Randall L, Mathew D McCubbins, and Barry R Weingast. 1989. A Theory of Political Control and Agency Discretion. *American Journal of Political Science* 33 (3):588-611.
- Campbell, Noel D. 1997. Making Drugs Safe and Available without the FDA. Dallas, TX: National Center for Policy Analysis.
- Cashore, Benjamin. 2002. Legitimacy and the Privatization of Environmental Governance: How Non State Market-Driven (NSMD) Governance Systems Gain Rule Making Authority. *Governance* 15 (4):6.
- Cashore, Benjamin, Graeme Auld, and Deanna Newsom. 2003. Forest Certification Eco-labeling Programs and their Policy-Making Authority: Explaining Divergence Among North American and European Case Studies. *Forest Policy and Economics* 5:225-247.
- Cashore, Benjamin, Graeme Auld, Deanna Newsom, and Jamie Lawson. 2001. Forest Certification Eco-labeling Programs and their Policy-Making Authority: Explaining Divergence Among North American and European Case Studies. Paper read at International Seminar on Political Consumerism, May 31 - June 3, at Stockholm, Sweden.
- Cashore, Benjamin, Graeme Auld, and Deanna Newsom. 2004a. Legitimizing Political Consumerism: The Case of Forest Certification in North America and Europe. In *Politics, Products, and Markets. Exploring Political Consumerism Past and Present*, edited by A. F. Micheletti and D. Stolle. New Brunswick: Transaction Press.
- Cashore, Benjamin, Graeme Auld, and Deanna Newsom. 2004b. The United States' Race to Certify Sustainable Forestry: Non-State Environmental Governance and the Competition for Policy-Making Authority. *Business and Politics* 5 (3):64.
- Cashore, Benjamin, and James Lawson. 2003. Comparing Forest Certification in the US and the Canadian Maritimes. *Canadian-American Public Policy* 53:1-44.
- Cashore, Benjamin William, Graeme Auld, and Deanna Newsom. 2004c. *Governing through markets: forest certification and the emergence of non-state authority*. New Haven: Yale University Press.
- Cason, Timothy N, and Lata Gangadharan. 2002. Environmental Labeling and Incomplete Consumer Information in Laboratory Markets. *Journal of Environmental Economics and Management* 43:113-134.
- CCIF. 2002. Analysis of the Status of Current Certification Schemes In Promoting Conservation. Washington, DC: Conservation and Community Investment Forum.
- Centeno, Julio Cesar. 1996. National Institutional Arrangements For The Certification Of Forest Management. Paper read at Conference on Economic, Social and Political Issues in Certification of Forest Management, at Malaysia.
- Cerda, Aldo. 2003. Public comments. Santiago, Chile: Instituto Nacional de Capacitación Profesional (INACAP).
- Cerda, Aldo, and Valentina Lira. 2002. The Economics of Sustainable Forest Management Certification. Paper read at Second World Congress of Environmental and Resource Economists, June 24th-27th, at Monterrey, CA.

- CertFor. 2001. Estándar Nacional de Certificación Forestal: Actividades del Grupo de Trabajo. Santiago, Chile: Fundación Chile.
- CertFor. 2002a. Chile Aceptado en el Consejo Europeo de Certificación Forestal. Santiago, Chile: Fundación Chile.
- CertFor. 2002. *Sistema de Certificación Forestal Chileno* [Internet]. SectorForestal.com, 2002b [cited Septiembre 2002]. Available from www.sectorforestal.com/contenidos/certfor1.asp.
- CertFor. 2004a. CertFor Manual. Santiago, Chile: Certfor Chile.
- CertFor. 2004b. Chain of Custody Standard. Santiago, Chile: Certfor Chile.
- CertFor. 2005. *Certificados Emitidos* [Internet]. CertFor, 31 de Marzo 2006 [cited October 21 2005]. Available from www.certfor.org/archivos/Sistema/certificados.htm.
- Chile Forestal. 1997. Seminario sobre Certificación. *Chile Forestal* 254:56.
- CONAF. 2004. *Catastro Nacional* [Internet]. CONAF, January 29 2004 [cited May 15 2004]. Available from www.conaf.cl.
- Cooley, Alexander, and James Ron. 2002. The NGO Scramble: Organizational Insecurity and the Political Economy of Transnational Action. *International Security* 27 (1):5-39.
- CORFO. 2001. Estándar de certificación forestal. *Innova Chile*, 22 de Septiembre, 2.
- Council of Economic Advisors. 2003. Economic Report of the President. Washington, DC: US White House and the Council of Economic Advisors.
- Counsell, Simon. 1999. Trickery or Truth? An Examination of the Effectiveness of the Forest Stewardship Council: The Rainforest Foundation UK.
- Crossley, Rachel. 1996. A Review Of Global Forest Management Certification Initiatives: Political And Institutional Aspects. Paper read at Conference On Economic, Social And Political Issues In Certification Of Forest Management, May 12-16, at Malaysia.
- Cutler, A Claire, Virginia Haufler, and Tony Porter. 1999. *Private authority and international affairs, SUNY series in global politics*. Albany: State University of New York Press.
- Dahl, Robert Alan, and Charles Edward Lindblom. 1953. *Politics, economics, and welfare: planning and politico-economic systems resolved into basic social processes*. New York: Harper.
- Darby, Jack. 2001. *Of Markets and Forests: Certification and Sustainable Forestry in Bolivia* [Internet]. 1998 [cited November 2001]. Available from <http://bolfor.chemonics.net/bolfor/cfv/Articulo%20darvy.htm>.
- de Bruijn, Theo, and Vicki Norberg-Bohm. 2001. Voluntary, Collaborative, and Information-Based Policies: Lessons and Next Steps for Environmental and Energy Policy in the United States and Europe. *Energy Technology Innovation Project*. Cambridge, MA: Belfer Center for Science and International Affairs, John F Kennedy School of Government.
- Diamantopoulos, Admanantios, Bodo B Schlegelmilch, Rudolf R Sinkovics, and Greg M Bohlen. 2003. Can socio-demographics still play a role in profiling green consumers? A review of the evidence and an empirical investigation. *Journal of Business Research* 56 (6):465-480.
- Dickson, Marsha A. 2001. Utility of No Sweat Labels for Apparel Consumers: Profiling Label Users and Predicting Their Purchases. *Journal of Consumer Affairs* 35 (1):96-119.

- Donovan, Richard Z. 1996. Role of NGOs. In *Certification of Forest Products: Issues and Perspectives*, edited by V. M. Viana, J. Ervin, R. Z. Donovan, C. Elliott and H. Gholz. Washington, DC: Island Press.
- Downs, Anthony. 1997. *An Economic Theory of Democracy*. New York: Addison Wesley.
- Dykstra, Dennis P, and Rudolf Heinrich. 1997. *FAO model code of forest harvesting practice*. 2nd ed. Rome: Forest Harvesting, Trade and Marketing Branch, FAO Forestry Department.
- Egestad, Peter. 2001. Certification in Fisheries and Forestry: Distrusting People while Trusting Numbers. *The Common Property Resource Digest* (56):3-5.
- Eisenhardt, Kathleen M. 1989. Agency Theory: An Assessment and Review. *Academy of Management Review* 14 (1):57-74.
- El Mercurio. 2003. Empresa estadounidense deja de comprar madera chilena. *El Mercurio*, March 5, 1.
- El Sur de Concepción. 2002. Siete empresas acreditadas: Sector forestal avanza en certificación ISO. *El Sur de Concepción*, 17 de Junio.
- Elliott, Chris. 1999. Forest Certification: Analysis from a Policy Network Perspective. Dissertation, Ecosystem Management, Department of Rural Engineering, Swiss Federal Institute of Technology, Lausanne, Switzerland.
- Elliott, Chris, and Richard Z Donovan. 1996. Introduction. In *Certification of Forest Products: Issues and Perspectives*, edited by V. M. Viana, J. Ervin, R. Z. Donovan, C. Elliott and H. Gholz. Washington, DC: Island Press.
- Elliott, Chris, and Rodolphe Schlaepfer. 2001. Global Governance and Forest certification: A fast track process for policy change. Paper read at International Conference on Social and Political Dimensions of Forest Certification, June 20-22, at Freiburg, Germany.
- Estrategia. 2000. Certificación Forestal se Vuelve Cada Día Más Importante. *Estrategia*, August 24, 15.
- Evans, Peter B. 1975. Multiple Hierarchies and Organizational Control. *Administrative Science Quarterly* 20:250-259.
- Falkner, Robert. 2003. Private Environmental Governance and International Relations: Exploring the Links. *Global Environmental Politics* 32:72-87.
- FSC. 1999. FSC Status of National and Regional Certification Initiatives. Oaxaca, Mexico: Forest Stewardship Council.
- FSC. 2003. 10 Years of FSC: Looking to the Future. Bonn, Germany: Forest Stewardship Council.
- FSC. 2004. FSC on-product labelling requirements. Bonn, Germany: Forest Stewardship Council.
- FSC. 2006. *FSC Forest Management and Chain of Custody valid certificates* [Internet]. FSC, January 9 2006 [cited January 28 2006]. Available from www.fsc.org/en/whats_new/fsc_certificates.
- Fuchs, Doris A, and Sylvia Lorek. 2002. Sustainable Consumption Governance in a Globalizing World. *Global Environmental Politics* 2 (1):19-45.
- Gallardo, Enrique. 2000. Legislación ambiental y Manejo Forestal en Chile: las condiciones dadas. *Chile Forestal* 280:35.

- Garcia-Johnson, Ronie, Gary Gereffi, and Erika Sasser. 2000. *Certification Institution Emergence: Explaining Variation*. Durham, NC.
- Garcia-Johnson, Ronie, Erika Sasser, and Gary Gereffi. 2001. Explaining Social and Environmental Certification Institutions: A Framework for Analysis. Paper read at 7th Annual Colloquium on Environmental Law and Institutions, December 7, at Durham, NC.
- Gayoso, Jorge. 2003. *Opinión sobre la situación de la Certificación Forestal en Chile* [Internet]. RENACE, 2002 [cited May 2003]. Available from www.renace.cl/campanas/certific_forestal_j_gayoso.pdf.
- Goldstein, Judith, and Stefanie Ann Lenway. 1989. Interests or Institutions: An Inquiry into Congressional-ITC Relations. *International Studies Quarterly* 33:303-327.
- Golodner, Linda F. 2004. *Industry Code of Conduct: A Consumer Perspective on Social Responsibility* [Internet]. National Consumers League, October 6, 1997 1997 [cited January 9 2004].
- Goodin, Robert E. 2003. Democratic Accountability: the Distinctiveness of the Third Sector. *European Journal of Sociology* 44 (3):359-397.
- Goodwin, Neva R, and Jonathan M Harris. 2001. *Better Principles: New Approaches to Teaching Introductory Economics*. Medford, MA: Global Development and Environment Institute, Tufts University.
- Haufler, Virginia. 1998. *Comparing Private Sector Initiatives: Labor Standards, Information Privacy, Environmental Management*. Washington, DC: Carnegie Endowment for International Peace.
- Haufler, Virginia. 2001. *A public role for the private sector: industry self-regulation in a global economy*. Washington, DC: Carnegie Endowment for International Peace.
- Hawkins, Darren, and Wade Jacoby. 2002. Conceptualizing Agents as Important Actors.
- Hawkins, Darren, and Wade Jacoby. 2003. How Agents Matter.
- Hoberg, George. 1999. The Coming Revolution in Regulating Our Forests. *Policy Options* 20:53-56.
- Holcombe, Randall G. 2003. Eliminating scope of practice and licensing laws to improve health care. *Journal of Law, Medicine & Ethics*:16.
- IISD. 1996. *Global green standards: ISO 14000 and sustainable development*. Winnipeg, Canada: International Institute for Sustainable Development.
- Jack, Darby. 1998. *Of Markets and Forests: Certification and Sustainable Forestry in Bolivia*.
- Kaimowitz, David. 1996. Political Economy of Environmental Policy Reform in Latin America. *Development and Change* 27:433-452.
- Kashima, Yoshihisa. 2000. Recovering Bartlett's social psychology of cultural dynamics. *European Journal of Social Psychology* 30:383-403.
- Koppell, Jonathan. 2003. *The Politics of Quasi-Government: Hybrid Organizations and the Dynamics of Bureaucratic Control*. Cambridge, UK: Cambridge University Press.
- Krauss, Matthias, Frieder Nake, and Susanne Grabowski. 2001. Chinese Whispers. Semiotically Mediating Between Idea and Program. Paper read at IEEE 2001 Symposia on Human Centric Computing Languages and Environments, at Stresa, Italy.

- Laffont, Jean Jacques. 1994. The New Economics of Regulation Ten Years After. *Econometrica* 62 (3):507-537.
- Laric, Michael V, and Dan Sarel. 1981. Consumer (mis)perceptions and usage of third party certification marks, 1972 and 1980: Did public policy have an impact? *Journal of Marketing* 45 (3):135-142.
- Laumann, Edward O, and David Knoke. 1987. *The organizational state: social change in national policy domains*. Madison, WI: University of Wisconsin Press.
- Lignum. 2001a. Desarrollo de un Standar Chileno para la Certificación de Sustentabilidad. *Lignum*.
- Lignum. 2001b. En el 2002 Chile Tendrá un Sistema de Certificación Convalidado. *Lignum*:41-43.
- Lignum. 2003a. Andersen Corporation anunció que sólo comprará madera chilena con sello FSC. *Lignum* 63:8.
- Lignum. 2003b. Comercialización de productos forestales chilenos en EE.UU.: A la conquista de América. *Lignum*:23-28.
- Lindahl, Karin Beland. 2001. The Development, standards and procedures of the Forest Stewardship Council (FSC) and the Pan European Forest Certification scheme (PEFC) in Sweden. Gloucestershire, UK: Fern.
- Linton, April. 2003. Introduction. *Politics & Society* 31 (3):359-362.
- Lowi, Theodore J. 1985. The State in Politics: The Relations between Policy and Administration. In *Regulatory policy and the social sciences*, edited by R. G. Noll. Berkeley, CA: University of California Press.
- Lyne, Mona, Daniel L Nielson, and John Tierney. 2003. A Problem of Principals: Common Agency and Social Lending at the Multilateral Development Banks. Paper read at Delegation to International Organizations, September 19-20, at Del Mar, CA.
- Lyne, Mona, and Michael J Tierney. 2002. Variation in the Structure of Principals: Conceptual Clarification for Research on Delegation and Agency Control. *Park City Conference on Delegation and International Organizations*. Park City, UT.
- Lyons, Anthony, and Yoshihisa Kashima. 2003. How Are Stereotypes Maintained Through Communication? The Influence of Stereotype Sharedness. *Journal of Personality and Social Psychology* 85 (6):989-1005.
- Macnamara, Jim R. 2004. The crucial role of research in multicultural and cross-cultural communication. *Journal of Communication Management* 8 (3):322-334.
- Maggi, Claudio, and Soo Yoon Kern. 2000. Competitiveness and Environmental Policies: The Cases of Chile and Korea. Duisburg: Institut für Entwicklung und Frieden de Gerhard-Mercator-Universität.
- Markopoulos, Matthew D. 2001. The Role of Certification in Community-Based Forest Enterprise (CFE). Paper read at International Conference on Social and Political Dimensions of Forest Certification, June 20-22, at Freiburg, Germany.
- Mater, Catherine M, V Alaric Sample, James R Grace, and Gerald A Rose. 1999. Third-party, performance-based certification: what public forestland managers should know. *Journal of forestry* 97 (2):6-12.

- McCubbins, Mathew D. 1985. The Legislative Design of Regulatory Structure. *American Journal of Political Science* 29 (4):721-748.
- McCubbins, Mathew D, and Thomas Schwartz. 1984. Congressional Oversight Overlooked: Police Patrols vs. Fire Alarms. *American Journal of Political Science*:165-179.
- Milward, H Brinton. 1998. Principles for Controlling Agents: The Political Economy of Network Structure. *Journal of Public Administration Research and Theory* 8 (2):203-221.
- Miranda, María Inés. 2002. CertforChile: Sistema de Certificación Chileno. *Lignum*:42-43.
- Mitnick, Barry M. 1980. *The political economy of regulation: creating, designing, and removing regulatory forms*. New York: Columbia University Press.
- Mitnick, Barry M. 1982. Regulation and the Theory of Agency. *Policy Studies Review* 1 (3):442-453.
- Moe, Terry M. 1984. The New Economics of Organization. *American Journal of Political Science* 28 (4):739-777.
- Morales, Eduardo. 2003. Certfor Chile: Una Iniciativa de Manejo Forestal Sustentable. *Temas de Fondo* 4 (8):8.
- Murphy, David F, and Jem Bendell. 1999. Partners in Time? Business, NGOs and Sustainable Development. Geneva, Switzerland: UN Research Institute for Social Development.
- Nielson, Daniel L, and Michael J Tierney. 2003. Delegation to International Organizations: Agency Theory and World Bank Environmental Reform. *International Organization* 57:241-276.
- O'Donnell, Cyril. 1952. The Source of Managerial Authority. *Political Science Quarterly* 57 (4):573-588.
- Okubo, Atsuko. 1999. Environmental Labeling Programs and the GATT/WTO Regime. *Georgetown International Environmental Law Review* 11:599-646.
- Olson, Mancur. 1965. *The Logic of Collective Action: Public Goods and the Theory of Groups*. Cambridge, MA: Harvard University Press.
- O'Neill, Tip, and Gary Hymel. 1994. *All politics is local, and other rules of the game*. New York: Times Books.
- O'Ryan, Raul, and Gabriel Fierro. 2000. International Trade and Sustainability of the Chilean Forestry Sector. *Documentos de Trabajo from Centro de Economía Aplicada*. Santiago, Chile: Universidad de Chile.
- Otero, Luis, and Jorge Maluenda. 1998. El ejemplo de la certificación del FSC: La certificación forestal como herramienta para el manejo sustentable de los bosques. *Ambiente y Desarrollo* XIV (4):38-52.
- Ozinga, Saskia. 2001. Behind the logo: An environmental and social assessment of forest certification schemes. Moreton-in-Marsh, UK: Fern.
- Palo, M, J Uusivuori, and G Mery. 2001. World Forests, Markets and Policies: Towards a Balance. In *World forests, markets and policies*, edited by M. Palo, J. Uusivuori and G. Mery. Dordrecht, Finland: Kluwer Academic Publishers.
- Parkinson, Thomas L. 1975. The Role of Seals and Certifications of Approval in Consumer Decision-Making. *Journal of Consumer Affairs* 9 (1):1-13.

- Pollack, Mark A. 1997. Delegation, Agency, and Agenda Setting in the European Community. *International Organization* 51 (1):99-134.
- Potoski, Matthew, and Aseem Prakash. 2002. Protecting the Environment: Voluntary Regulations in Environmental Governance. *Policy Currents* 11 (4):8.
- Pressman, Jeffrey L, and Aaron B Wildavsky. 1984. *Implementation: how great expectations in Washington are dashed in Oakland: or, why it's amazing that federal programs work at all, this being a saga of the Economic Development Administration as told by two sympathetic observers who seek to build morals on a foundation of ruined hopes*. 3rd ed, *The Oakland Project series*. Berkeley: University of California Press.
- Princen, Thomas. 1997. The Shading and Distancing of Commerce: When Internalization is Not Enough. *Ecological Economics* 20:235-253.
- Princen, Thomas. 1999. Consumption and environment: some conceptual issues. *Ecological Economics* 31 (3):347-363.
- Quiroga, Rayén. 1996. La economía ecológica y el debate sobre globalización y medio ambiente. *Ambiente y Desarrollo* XII (1):70-75.
- Raga, Fernando. 2002. Certificación y campañas de presión. *Chile Forestal* 293:11.
- Revesz, Richard L. 2001. Federalism and Environmental Regulation: A Public Choice Analysis. *Harvard Law Review* 115 (2):553-641.
- Rodenstein, Roy, and Judith S Donath. 2000. Talking in Circles: Designing a Spatially-Grounded Audioconferencing Environment. *CHI Letters* 2 (1):81-88.
- RPPI. 2004. *Green Groceries: Consumers, Product Labels and the Environment* [Internet]. Reason Public Policy Institute, March 1996 [cited October 15 2004]. Available from file://C:%5CDocuments%20and%20Settings%5CAll%20Users%5CDocuments%5Cpdf%20documents%5CRPPI%201996%20Green%20Groceries.pdf.
- Russell, Clifford S, and Christopher D Clark. 2003. Public Information Provision as a Tool of Environmental Policy.
- SAF. 1999. Task Force on Forest Management Certification Programs: 1999 Report: The Society of American Foresters.
- Sasser, Erika. 2001. Gaining Leverage: NGO Influence on Certification Institutions in the Forest Products Sector. Paper read at Forest Policy Center's Global Initiatives and Public Policies: First International Conference on Private Forestry in the 21st Century, March 26, at Atlanta, GA.
- Schlegel, Bastienne, and Cristian Echeverria. 2001. *Certificación Forestal en Chile* [Internet]. Programa de Producción Forestal y Medio Ambiente (Proforma), Universidad Austral de Chile, 2001a [cited January 2001]. Available from www.uach.cl/proforma/certfor/presenta.htm.
- Schlegel, Bastienne, and Cristian Echeverria. 2001. *Forest Certification in Chile: National Initiatives* [Internet]. Programa de Producción Forestal y Medio Ambiente (Proforma), Universidad Austral de Chile, 2001b [cited January 2001].
- Schneider, Anne. 1987. Coproduction of public and private safety. *Western Political Quarterly* 40 (4):611-630.
- Schneider, Anne L, and Helen Ingram. 1997. *Policy Design for Democracy, Studies in Government and Public Policy*: University of Kansas.

- Schwarcz, Steven L. 2002a. Private Ordering. *Northwestern University Law Review*:26.
- Schwarcz, Steven L. 2002b. Private Ordering of Public Markets: The Rating Agency Paradox. Washington, DC: AEI-Brookings Joint Center for Regulatory Studies.
- Scott, John. 2004. *Social network analysis: a handbook*. London: Sage.
- Sheppard, Hale E. 1999. Certificación forestal (II): Una opción medioambiental de vanguardia para Chile. *Ambiente y Desarrollo* XV (4):54-57.
- Silva, Eduardo. 1994. Contemporary Environmental Politics in Chile: The Struggle Over the Comprehensive Law. *Industrial & Environmental Crisis Quarterly* 8 (4):323-343.
- Silva, Eduardo. 1996. Democracy, Market Economics, and Environmental Policy in Chile. *Journal of Interamerican Studies and World Affairs* 38 (4):1-33.
- Silva, Eduardo. 1997. Conservation, Sustainable Development and the Politics of Native Forest Policy in Chile. In *Latin American Environmental Policy in International Perspective*, edited by G. J. MacDonald, D. L. Nelson and M. A. Stern. Boulder, CO: Westview Press.
- Sinclair, Timothy J. 1999. Bond-Rating Agencies and Coordination in the Global Political Economy. In *Private authority and international affairs*, edited by A. C. Cutler, V. Haufler and T. Porter. Albany: State University of New York Press.
- Sonnenfeld, David A, and Arthur P Mol. 2002. Globalization and the Transformation of Environmental Governance. *American Behavioral Scientist* 45 (9):1318-1339.
- Spaeth, Joel L. 1985. Job power and earnings. *American Sociological Review* 50:603-617.
- Talland, George A. 1956. Cultural differences in serial reproduction. *Journal of Social Psychology* 43:75-81.
- Tanzi, Vito, and Ludger Schuknecht. 1997. Reforming government: An overview of recent experience. *European Journal of Political Economy* 13:395-417.
- Taylor, Donald A. 1958. Certification Marks - Success or Failure? *Journal of Marketing* 23 (1):39-46.
- Taylor II, George F, John Nittler, and Ivo Kraljevic. 2002. Global Initiatives, Public Policies and Private Forestry in Bolivia: Lessons to Date and Remaining Challenges. In *Forest Policy for Private Forestry: Global and Regional Challenges*, edited by L. Teeter, B. Cashore and D. Zhang. Oxon, UK: CAB International.
- Teisl, Mario F, and Brian Roe. 1998. The Economics of Labeling: An Overview of Issues for Health and Environmental Disclosure. *Agricultural and Resource Economics Review* 28 (2):140-150.
- Thornber, Kirsti. 1999. Instruments for Sustainable Private Sector Forestry. *Overview of Global Trends in FSC Certificates*, edited by IIED. London: Forestry and Land Use Programme, International Institute for Environment and Development.
- Thornber, Kirsti. 2003. Certification: a discussion of equity issues. In *Social and Political Dimensions of Forest Certification*, edited by E. E. Meidinger, C. Elliott and G. Oesten. Freiburg, Germany: Institut für Forstökonomie.
- UNECE/FAO. 2001. Forest Products Annual Market Review, 2000-2001. Geneva, Switzerland: United Nations Economic Commission for Europe / United Nations.
- Upton, Christopher, and Stephen Bass. 1996. *The forest certification handbook*. Delray Beach, FL: St Lucie Press.

- USTR. 2002. US and Chile Conclude Historic Free Trade Agreement. Washington, DC: United States Trade Representative.
- Viana, Virgilio M, Jamison Ervin, Richard Z Donovan, Chris Elliott, and Henry Gholz, eds. 1996. *Certification of forest products: Issues and perspectives*. Washington, DC: Island Press.
- Vrieling, Mirjan van Heffen-Oude, and Taco Brandsen. 2004. Codes of conduct: private regulation of the public interest? Paper read at Conference of the Institute for Governance Studies, June 17-18, at Enschede, the Netherlands.
- Walter, Emily. 2003. From Civil Disobedience to Obedient Consumerism? Influences of Market-Based Activism and Eco-Certification On Forest Governance. *Osgoode Hall Law Journal* 41:531-556.
- Wartelle, Jeff. 2002. Growing markets, growing success with certified wood. *Environmental Design and Construction*, July, 12-18.
- Washburn, Michael P, and Nadine E Block. 2001. Comparing Forest Management Certification Systems and the Montreal Process Criteria and Indicators. Washington, DC: Pinchot Institute for Conservation.
- Wasserman, Stanley, and Katherine Faust. 1999. *Social Network Analysis: Methods and Applications*. New York: Cambridge University Press.
- Waterman, Richard W, and Kenneth J Meier. 1998. Principal-Agent Models: An Expansion? *Journal of Public Administration Research and Theory* 8 (2):173-202.
- Wellman, Barry. 1988. Structural analysis: from method and metaphor to theory and substance. In *A Network Approach*, edited by B. Wellman and S. D. Berkowitz. Cambridge: Cambridge University Press.
- Wergens, Bo. 1995. Forest industry in sustainable development. *Unasylva* 46 (182).
- Williamson, Oliver E. 1967. Hierarchical Control and Optimum Firm Size. *Journal of Political Economy* 75 (2):123-138.
- Williamson, Oliver E. 1970. *Corporate control and business behavior: an inquiry into the effects of organization form on enterprise behavior*. Englewood Cliffs, NJ: Prentice Hall.
- Wood, B Dan, and Richard W Waterman. 1991. The Dynamics of Political Control of the Bureaucracy. *American Political Science Review* 85 (3).
- Worsham, Jeff. 2003. Multiple Principals, Multiple Signals: A Signaling Model of Principal-Agent Relations. Paper read at Meeting of the National Public Management Research Conference, October 9-11, at Georgetown University.
- Yilmaz, Yesim. 1998. Private Regulation: A Real Alternative for Regulatory Reform. Fairfax, VA: Cato Institute.
- Zadek, Simon, Sanjiv Lingayah, and Maya Forstater. 1998. *Social Labels: Tools for Ethical Trade*. London: New Economics Foundation.