CLEANING UP THE WATER LAW OF BRITISH COLUMBIA: A PROBLEMISTIC APPROACH TO RULE CHANGES

MARTIN SCHULZ
University of British Columbia

P. DEVEREAUX JENNINGS,
University of Alberta

DAVID PATIENT
Catholic University of Portugal

INTRODUCTION

Most models of institutional change (e.g., Dacin, Goodstein, & Scott, 2002) rely on the presence of powerful agents intent on changing the institutions. Few institutional change studies concern situations where powerful agents are absent or do not pursue change. In this paper, we argue that institutional change is also driven, at least in part, by the problems that institutional rules experience. Thus, this research departs from prior studies on institutional rules in three ways. First, we move our analysis to the level of institutional rules. Second, we broaden the focus to include a range of rules, regardless of the attention they receive from powerful interests. Third, we approach institutional rule change from a '*problemistic'* (i.e., problem-oriented) perspective, building on Carnegie models that stress the role of problems in organizational search and adaptation (Cyert and March, 1963; Jennings, Schulz, Patient, Gravel, Yuan, 2005). In particular, we explore three problem-related mechanisms: *problem attraction*, *problem recognition*, and *problem engagement*.

To develop our rule-based, problemistic approach to institutional change we test our models with longitudinal data of water statutes in British Columbia, Canada. Laws have played an important role for theories of organizations since Weber's work on legitimacy and bureaucracy (Weber, 1978). Water laws can be considered a fundamental social institution, and the relatively independent political status of provinces in the Canadian federation, making British Columbia (BC) a natural laboratory for the study of legal rule changes.

THEORY

The History of the Water Act

The Water Act developed in response to a variety of water-related issues, including technical problems relating to specific uses, problems relating to the allocation and administration of licenses, and political issues regarding control of water usage. A system based on riparian rights inherited from England has over time been replaced by one more suited to exploitation of abundant mining and agricultural resources, provision of electricity to large urban centers, and competition for water among large numbers of diverse, licencees. While the principles underlying the Water Act were proclaimed in the late nineteenth century, it fell to later Water Acts to implement them. For example, the Water Acts of 1909 and 1914 created the Water Rights Branch, the Board of Investigation, the Water Controller, and District Engineer units. Technical challenges associated with the large scale water works were also addressed, as were needs of mining and farming sectors, which required the construction of large dams, water

storage devices, and irrigation systems. Some changes to the law were unsuccessful, such as the creation of private water works by legislation, which turned out to be prone to bankruptcy. But in due course, alternate technical and economic solutions (in this case, water communities, and publicly funded improvement districts) were implemented in response to problems.

Not all water-related problems - political, bureaucratic, or technical - were successfully addressed within the Water Act framework. For example, problems relating to water quality led only to temporary experimentation within the Act. In other cases, previously addressed issues came back in a new form, requiring further revision of legal sections – for instance, aboriginal claims to water. Experiments and re-appearances such as these underscore a non-functional, evolutionary aspect of problem-driven change – and the need to capture it more formally.

A Problemistic Model of Rule Changes

Our problemistic approach extends the notion of limited rationality into the domain of institutional change. Limited rationality produces imperfect rules and thereby gives rise to problems that drive institutional rule change. Problems have played an important role in several other organizational approaches, including garbage can models (Cohen, March and Olsen, 1989), constructionist approaches (Schneider, 1985), performance feedback models (e.g., Cyert and March, 1963; Greve, 2003), and rule-based models of organizational learning (March, Schulz, & Zhou, 2000). It might be worthwhile for studies of institutional change to explore how problems become connected to available solutions, how solutions attract and absorb new problems, how problems are recognized only on some occasions, and how attention to problems at one time and place can deflect attention from problems at other times and places

We explore three problem-related mechanisms. In the *problem attraction* mechanism, imperfect rules attract problems and experience higher rates of change. In *problem recognition*, imperfect rules experience contests that recognize problems in ways that elevate or absorb them. In *problem engagement*, imperfect rules compete for scarce problem solving resources, lock up available resources, and impede rule changes in adjacent domains.

Problem Attraction. Organizational and institutional rules have specific content; that is, topics that rules 'talk' about and that connect the rules to operational domains. In this way, each rule topic generates its own stream of problems. We argue that the likelihood that a rule encounters problems is a positive function of topic density, i.e., the number of topics to which it relates. Each topic added to a formal rule increases its exposure to new operational domains, thereby attracting more problems for which the rule can be seen as the cause. A rule with a large 'surface area' (in terms of topics included) then presents a larger target for problems. Topic-dense rules can also attract problems because they represent "messes" (Abrahamson, 2002). In addition, topics might clash with each other, producing problems at a rate that would rise with the square of the number of topics in a rule (Blau, 1970).

Hypothesis 1. *The rate of legal rule change will be proportional to topic density.*

Hypothesis 2. *The rate of legal rule change will accelerate with topic density.*

The relationship between topic density and rule change might be negative. It can be more difficult to change topic dense rules, e.g., because the rules are more entangled with other rules or because more energy is needed to change complex rules (Hannan and Freeman, 1989). Thus,

Hypothesis 3. *The rate of legal rule change will decrease with topic density.*

Problem Recognition. Imperfect rules can produce outcomes that become recognized as problems. Court contests play an especially important role in recognizing problems associated with legal rules. From a problemistic perspective, courts play a double role for legal statute change. *Problem elevation* occurs when the court recognition of problems makes problems more salient, as when published case law guides subsequent legal discourse and decisions, stimulates recognition of related problems, and activates problem instigators (March and Olsen, 1989). *Problem absorption* occurs when a legal conflict is resolved through applying rules and confirming their legitimacy (March et al, 2000). In turn, these rules can be increasingly relied upon (by courts and other parties), resulting in a stabilizing "contagion of legitimacy."

Whether problems are elevated or absorbed by a court case depends on the type of problem involved. *Broad* (versus *narrow)* problems involve multiple domains or more severe or numerous implications. We expect broad problems to be elevated and narrow problems to be absorbed. To explore this, we focus on four types of contests. The first two involve 1) broad problems contests that challenge State domination, and 2) contests that challenge the rationality and coherence of the rule system.

Hypothesis 4. *The rate of legal rule change will increase with the number of rule contests in which the State is a losing party.*

Hypothesis 5. *The rate of legal rule change will increase with the number of multi-domain rule contests.*

In contrast, courts might narrowly focus a case decision in a problemistic search manner (Cyert and March, 1963), i.e., by focusing on statutes in the immediate environment of the case. In such contests, the problems considered relate to a narrower groups of constituents, and have more limited implications. In such cases, rules might become stabilized and reconfirmed by absorbing the problems involved . The fourth type of court contest is characterized by high levels of ambiguity and interpretation. Extensive re-interpretation of a statute section in a court case can uncover problems of the rule and thereby prompt rule change.

Hypothesis 6. *The rate of legal rule change will decrease with the number of narrow-domain rule contests.*

Hypothesis 7. *The rate of legal rule change will increase with the number of rule contests that involve extensive re-interpretation of the rule.*

Problem Engagement. Limited cognitive and administrative resources can impair efforts to solve the problems of imperfect rules. Rule changes can depend on the resources available for rule change, for example, over the tenure of a political regime. The resources for rule change are expected to be less at the beginning and at the end of a political party's tenure in office.

Hypothesis 8: *The rate of rule change will be reduced during transition periods between political regime changes.*

Research on organizational rule change has emphasized ecological relationships between rules (Schulz, 1998). Rules are assumed to belong to domains (jurisdictions) that can either *compete* for critical resources or infect each other with impulses (March et al., 2000: 70). An important mechanism for legal rule change can be contagion via attention, as when engagement with rule problems in one domain positively affects rule change in another domain.

The opposite, however, can also be argued. There may be *competition* between domains for attention and resources, whereby attention to a problem in a focal domain can prevent

problem engagement in related domains by locking up critical resources, e.g., available expertise.

Hypothesis 9a: *The rate of rule change in a legal domain will increase with the amount of legislative activity in adjacent domains.*

Hypothesis 9b: *The rate of rule change in a legal domain will decrease with the amount of legislative activity in adjacent domains.*

DATA AND METHOD

We collected data on all amendments and repeals to the British Columbia Water Act from 1914-2003, on all higher court cases involving the Water Act from 1901-2004, on legislative activity in the BC legislature 1909-2004, and on several time series regarding political and economic changes. All legal rule sections and changes to them were sequentially linked to create the complete data set on law section changes. Across the ninety years, 2118 sections were created and used in our analyses. Using split spells of 150 days yielded approximately 33,498 split-spell observations, with 877 rule change events: 645 amendments and 242 repeals. We integrated into the legal rules database the 312 reported court cases between 1909 and 2004 that referred to the Water Act of British Columbia.

Variables

Our dependent variable, *changes to legal rules,* is any amendment or repeal of a section of the BC Water Act between 1914 and 2003. These two types of changes capture important forms of institutionally adaptive responses (March and Olsen, 1989).

To capture the *density of topics* in individual sections, we counted how many of the seventy-two topic dimensions in the Water Act (identified by a grounded theory approach) were tapped by the section. To capture court contest related variables, we created four covariates: (1) the *number of legal contests where the government lost*, (2) the *breadth of co-citation* of non-Water Act statutes, 3) the *number of multi-domain contests*; 4) the *number of legal contests that substantially re-interpreted the focal section*.

Political regime transition period was computed as the period starting one year prior to and ending one year subsequent to the transition between different political parties in office. *Legislative activity in adjacent domains* was computed by the number of statute pages (excluding the Water Act) that were enacted, amended or repealed in a given year in the BC legislature. A text-based metric was used to capture the semantic proximity of *each* statute changed by the BC legislature in that year to the BC Water Act using co-citations in the LexisNexis database.

Three types of *control variables* were included in our models. The first type captures exogenous social and political processes and was expected to affect the baseline of problems: (a) *conservative* versus *progressive regime*, (b) *World War I* and *World War II as* shocks to the institutional system likely to intensify the rate of problem production, (Baron et al., 1986; Dobbin and Dowd, 1997), and (c) a one-year lag in *Canadian GDP,* as economic development is likely to increase problem production and demands for rule changes (Perrow, 1970; Weber, 1919). The second type of control variable related to substantial reconfigurations of the rule books themselves. The three *rule regimes* were: (1) from 1914-1938, (2) from 1939-1978, and (3) from 1979-2003. We include two dummy variables to capture the historically unique spikes in legal rule changes at the *overhaul* of each of earlier two regimes. The third type of control variable was for history specific to the particular law section. *Duration* was measured as the

time passed between the time the section was changed previously and the beginning of the subspell. *Prior amendment* represents any prior revision to a water law section. Finally, *topic area groups* is a set of dummy variables that collapses the 72 topic dimensions into seven major groups: (1) physical operations, (2) goal of the section, (3) constituent actors, (4) bureaucratic actors, (5) license procedures, (6) non-license procedures, and (7) externalities. Topic area dummies are not linearly dependent and are all included in the analysis.

Methods

Event history analysis was used to model the hazard rates of water law section revisions. Episode splitting was used to capture time-changing covariates. All models were estimated with the LIFEREG procedure in SAS (Version 8.2), and the robustness of the standard error estimates was checked using STATA's Huber/White sandwich estimator.

RESULTS AND DISCUSSION

The hypotheses were tested by stepping in relevant covariates into the baseline model containing controls in order to build a more complete model of legal rule revisions. Most of the exogenous institutional effects controlled for were significant in predicted directions: wars, progressive regimes, overhauls, economic activity, and prior amendment rates all increased revision rates. In addition, later rule book editions had fewer rule changes. Finally, duration had a negative effect, a result that might reflect that rules stabilize with age, though this might also be produced by unobserved population heterogeneity.

As predicted by Hypotheses 1 & 2, topic density increased the rate of rule revision, and, in many instances, in accelerating fashion: an increase in topic density from 0 to 5 topics increased the multiplier by 0.63, while an (equally large) increase in topic density from 20 to 25 increases the multiplier by 0.96. Thus, topic dense rules are not more inert (Hypothesis 3).

As predicted in Hypotheses 4-6, cases where the government lost and multi-domain cases have positive effects on rule revision rates, while the number of narrow-domain cases has a negative effect on rule changes. However, contrary to Hypothesis 7, court contests involving greater interpretation of legal rules did not have a significant effect.

As predicted by Hypothesis 8, during the transition period between different political regimes the rate of rule change was significantly depressed. Consistent with Hypothesis 9b, problem engagement in legal domains that were related to (but different from) the Water Act impeded changes in the Water Act itself. Thus, it appears that problem engagement depends on scarce organizational resources and is subject to competition for these resources.

CONCLUSION

What drives institutional change? Our answer, "problems," might appear simplistic at first sight. However, our exploration of this problemistic view suggests that three mechanisms of problemistic search provide endogenous forces for change. First, a rule's thematic density increases its susceptibility to change. Second, rule contests seem to play a differential role for institutional change: narrow contests stabilize rules, while broad contests destabilize them. Third, competition between a focal rule and related rules can reduce changes to a focal rule.

Our study offers renewed support for the importance of the organizational basis of institutions (March and Olsen, 1989). In contrast to theories of institutional change that stress

'grand' historical forces and powerful actors, our theory casts a 'squeaky wheel' vision of institutional evolution, in which problems arise from the 'devil in the detail' of imperfect rules that accumulate imprints of history, generate contests, and operate in an environment of other rules. In that view, institutions are driven by internal mechanisms that are considerably independent from external drivers, a view that allows institutions to be autonomous engines of history. We consider it a promising outlook that might encourage others to continue on this path.

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