




State Agency Discretion and Entrepreneurship in Regulated Markets

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Abstract

Barriers to entry in regulated markets are frequently conceptualized as static features that must be removed or overcome if new entrants are to successfully enter a market. But government institutions regulating markets often comprise multiple levels that exist in tension with one another due to differing incentives and motivations. We argue that the principal–agent tension between elected officials and agency bureaucrats may render regulatory barriers to entry more malleable, even in the absence of formal policy changes. To test this proposition, we bring the administrative state center stage and examine how regulatory discretion—regulatory agencies’ flexibility to interpret and implement public policies created by elected officials—can influence the market entry of new ventures. Using data on regulatory approval of hydroelectric facilities in the United States from 1978 to 2014, we find that increased state agency discretion improves outcomes for new ventures relative to incumbent firms by freeing regulatory agency officials to interpret and implement policies according to a professional motivation of public service and reducing incumbents’ political influence.

Keywords: institutional theory, entrepreneurship, nonmarket strategy, regulated markets, regulatory discretion, principal–agent, administrative state

The institutional environment can cause entrepreneurial firms to either flourish or fail by conditioning access to resources (Hiatt, Sine, and Tolbert, 2009; York, Vedula, and Lenox, 2018), facilitating legitimacy and the support of important stakeholders (King and Soule, 2007; Battilana and Lee, 2014), and shaping the nature of competitive interactions (Dowell and David, 2011). The impact of government institutions on new entrants is particularly high in regulated markets, such as pharmaceuticals, biotechnology, telecommunications, energy, and finance, in which regulatory policies can raise costs and influence entry through product standards and approval, pricing guidelines, and licensing rules (Dowell

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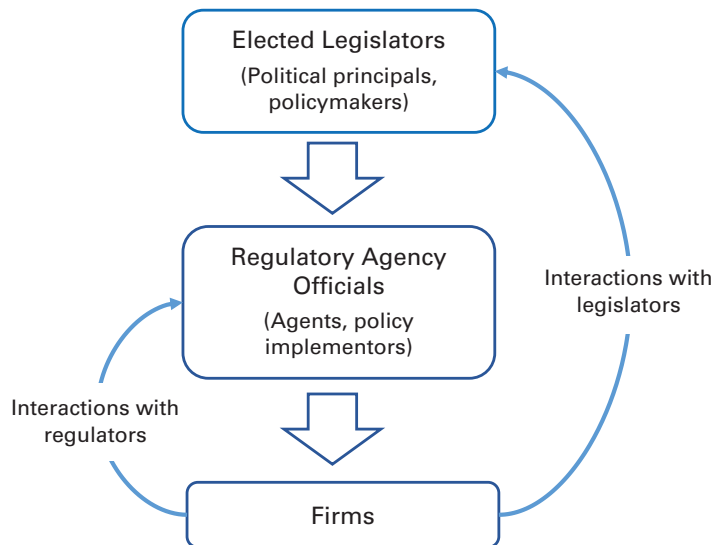
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and Killaly, 2009). Incumbent firms often create additional challenges for new firms by using their political influence to erect regulatory barriers to entry (Dean, Brown, and Stango, 2000). Scholars have generally treated regulatory barriers as relatively static features of the institutional environment that must be removed or overcome if new firms, because of their lack of resources and political connections, are to successfully enter regulated markets (Sine, Haveman, and Tolbert, 2005). Yet evidence shows that new entrants enter these markets with significant variation (Sine and Lee, 2009; Gurses and Ozcan, 2015). Little research thus far has theoretically and empirically examined the formal institutional structures that may allow new entrants to overcome barriers to entry in regulated markets.

This gap may result in part from the organization theory and strategy literatures' common assumption that government institutions are monolithic regarding policy change: elected officials enact or repeal policies that fundamentally shape market features and alter firms' behavior (Dobbin and Dowd, 2000). A large body of literature has explored how firms target elected officials through corporate political activities, such as lobbying and financial contributions, to shape regulatory policies in their favor (Mizruchi, 1992; Walker and Rea, 2014). But this assumption neglects the administrative state's role in implementing policy (Baron, Dobbin, and Jennings, 1986; Kalev, Shenhav, and De Vries, 2008; Hiatt and Park, 2013).

Government institutions regulating markets often have multiple levels, including elected bodies that create policies and the state agencies that interpret and implement them (Edelman and Suchman, 1997; Seo and Creed, 2002). Although state agencies are presumably constrained by the legislative bodies that monitor them, they can exercise a fair amount of latitude in interpreting and implementing policies (Evans, Rueschemeyer, and Skocpol, 1985; Evans, 1995; Guillén and Capron, 2016). From the perspective of agency theory, this creates tension between state agency officials and their political principals (McCubbins, Noll, and Weingast, 1987; Meyer et al., 2014). State agencies may implement policies in ways that differ from the preferences of the elected officials who crafted them. Not only can this foster variation in the regulatory environment, even in the absence of policy changes, but it may also affect the barriers to entry for new firms. We suggest that prior studies' conceptualization of government institutions as monolithic entities that enact or repeal regulatory policy obscures important political institutional factors and principal-agent tensions that could affect market entry and thereby requires closer theoretical examination.

We address this limitation by adopting a pluralistic view of government institutions (see Figure 1) to explore how variation in state agencies' policy implementation affects organizations. Our central argument is that regulatory discretion—the formally granted flexibility of regulatory agency officers to interpret and implement public policies created by elected officials—can foster new entry in regulated markets. Drawing on the political science and public administration literatures, we propose that regulatory agencies' and elected officials' different incentives can lead to variation in how regulatory decisions are made. To the degree that agency bureaucrats are granted discretion, regulatory agencies' decision making is guided by bureaucrats' own interests, which emphasize societal welfare outcomes. But as agency discretion decreases, agency bureaucrats' decision making becomes more aligned with policymakers'

Figure 1. Pluralistic institutional environment.

interests, which tend to be guided by the organized interests that enhance their electoral outcomes. This principal–agent tension likely affects the regulatory approval of new ventures. By placing the regulatory agency center stage, we explore the possibility that regulatory-imposed barriers to entry are not always fixed but may vary depending on how firms’ and institutional factors interact with regulators’ latitude to interpret and implement the law.

We conduct an empirical examination of the regulatory approval of new facilities in the U.S. hydroelectric power sector from 1978 to 2014, to consider the impact of institutionalized discretion on state regulatory agency outcomes. This market provides a useful setting to explore the impact of regulatory discretion on new entrants for two reasons. First, regulatory agencies play a significant role in firms’ ability to gain entry to this market. No firm can legally operate a hydroelectric facility without formal regulatory approval—a process that often takes years. Second, although the Federal Energy Regulatory Commission (FERC) ultimately grants all licenses to operate, individual state agencies have the authority to place restrictions on federal regulatory approval, resulting in significant variation across states in how regulatory policy is implemented for new facility licensing.

This paper aims to offer two primary theoretical contributions. First, we engage with the institutions and entrepreneurship literature (Hiatt, Sine, and Tolbert, 2009; Navis and Glynn, 2010) by examining how state agency decision making can substantively shape regulatory barriers to entry for new ventures. Institutional theory has generally focused on how formal policies affect entrepreneurship by raising or lowering regulatory barriers to entry and has neglected the regulatory environment’s structural elements that may differentially affect new venture outcomes even if formal policies remain unchanged. We argue that the structural elements responsible for creating and implementing formal policies are not homogenous and that these distinctions

may actually level the playing field for new ventures, relative to incumbents, in regulated markets.

Second, we engage with the business-government-relations literature (Dorobantu, Kaul, and Zelner, 2017; Hiatt, Carlos, and Sine, 2018; Leitzinger, King, and Briscoe, 2018) by exploring how the administrative state's implementation of public policy affects firms. This is an important area of investigation because regulators are often the primary and most frequent point of contact for businesses (Carpenter, 2002). Regulators also have different incentives than elected officials and are less likely to be influenced by the traditional tools of political influence: they are generally not elected, cannot legally receive financial contributions, and often have job protections associated with civil service policies (Skocpol and Finegold, 1982). Yet research has only begun to explore the possible mechanisms by which state agencies influence firms through policy implementation. We hope to enhance our understanding of these mechanisms by illustrating how variation in policy implementation differentially affects new and established firms.

REGULATORY DISCRETION AND NEW VENTURE ENTRY

Regulated Markets and Barriers to Entry

Regulated markets can create substantial obstacles for participating organizations. Compliance with regulations, such as pollution abatement in the chemicals sector (Hoffman, 1999), zoning laws in the urban development market (Pang and Rath, 2007), credit-risks tests in the banking sector (Marquis and Lounsbury, 2007), and consumer health and safety requirements in the pharmaceuticals industry (Maguire and Hardy, 2009), imposes significant financial and organizational costs on regulated firms. Similarly, government may impose costs directly via entry and exit rules, such as those associated with antitrust regulation and permitting or licensing requirements (Dobbin and Dowd, 2000).

These costs often disproportionately burden new firms, relative to incumbents. Regulations can increase the capital required to enter and the complexity of business operations, resulting in a significant learning-curve effect (Dean and Brown, 1995). In a longitudinal study of pollution-intensive manufacturing firms, Dean and colleagues (2000) found that environmental regulations deterred entry because of the economies of scale in purchasing pollution-abatement equipment and the administrative costs of understanding complex regulations. Regulations can also disproportionately burden new firms through the permitting process (Djankov et al., 2002; Biber and Ruhl, 2014). As preconditions for undertaking business activity, permits are often costlier to new entrants, as incumbent firms may be grandfathered in to less-stringent permitting requirements. Even if permits are equally stringent for entrants and incumbents, permits often involve substantial fixed costs, which can be much easier for established firms to bear. For instance, New York State's enactment of more-stringent environmental permitting regulations resulted in fewer foundings of new manufacturing firms (List, 2003).

In contrast to new firms, incumbent firms often have the resources to use the regulatory environment to their benefit, thereby putting potential entrants at a greater disadvantage. Scholarship suggests that incumbent firms in

regulated markets attempt to manage these obstacles by maximizing both their relative and absolute influence over the institutions that govern them, through corporate political activities that include informational, financial, and constituency-building tactics (Mizruchi, 1992; Hiatt, Grandy, and Lee, 2015; Luo, Kaul, and Seo, 2018). Interviews with regulatory officials responsible for approving hydroelectric power applications illustrated how incumbent firms in our context use political ties to their advantage. One official explained,

There was a project a few years ago . . . [and] they were being hindered by some administrative rules. So, they got the legislature to pass a bill that was specific to their project that created an exclusion. Generally, [if] someone has some political connection, some clout, they get the legislature to pass an exclusion.

Another official told us, "There have been cases over the years where the interim committees of the legislature will get involved [in regulatory decisions] at the behest of some fairly large proposals or projects."

Given new firms' challenges in entering regulated markets, most studies that examine entry into regulated markets focus on policy change. Scholars have shown that policy changes influence how and where firms compete, prompting incumbent firms to adjust their product and market scopes as new firms enter the market (Delmas and Tokat, 2005). Deregulation has been found to affect both the amount of entry and its specific character, such as technological and product differentiation among firms (Russo, 2001; Delmas, Russo, and Montes-Sancho, 2007). Other studies have illustrated how powerful non-market actors affect policy by shaping societal norms and institutional logics (Almandoz, 2012; York and Lenox, 2014; York, Hargrave, and Pacheco, 2016). For instance, Pacheco and colleagues (2014) showed that entry into regulated electric power markets was largely facilitated by the actions of environmental movement organizations that drew policymakers' attention to renewable startups, leading to changes in state policy.

One reason for the emphasis on policy change is the management literature's common assumption that government institutions act as a single, uniform entity. When elected officials enact or repeal regulatory policies, the effects are expected to be predictable and uniform (Dobbin and Dowd, 1997). However, government institutions consist not only of elected bodies that create policies but also of state agencies that interpret and implement them (Kalev, Shenhav, and De Vries, 2008). In a regulatory context, this suggests that policy can be implemented in ways that differ from the policymakers' original intent. Research to date has not explored the tension that can exist between policymakers and policy implementers and whether this tension can affect barriers to entry into regulated markets. We seek to address this limitation by taking a pluralistic view of regulatory institutions and highlighting the role of state agencies. Specifically, we explore how regulators' discretion in interpreting and implementing policies can alter new ventures' barriers to entry.

Regulatory Discretion and Agency Decision Making

According to the political science literature, discretion is the flexibility formally granted, often through statutes and laws, to regulatory agency officials to

interpret and implement public policies created by elected officials (Huber and Shipan, 2002). Discretion can allow agencies to make decisions that differ from those that elected officials expect (Calvert, McCubbins, and Weingast, 1989) and to “make judgements regarding policy actions not prescribed in detail by formal rules or legislation” (Ringquist, 1995: 331), thereby granting greater influence to regulatory agencies over how policies are implemented (Potoski and Woods, 2001). Discretion is tightly linked to the legislature’s ability to coerce its regulatory agencies through formal means, such as by writing detailed policies with little room for interpretation (Ringquist, 1995; Huber and Shipan, 2002) or by creating administrative procedures acts (McCubbins and Schwartz, 1984; McCubbins, Noll, and Weingast, 1987, 1989). Regarding the former, legislators can grant greater discretion to regulatory agencies by writing vague policy goals and by allowing regulators the latitude to interpret and turn them into more-specific agency rules that directly affect firms (Pires, 2011). Huber and Shipan (2002) illustrated this mechanism in a study of states’ implementation of the federal Medicaid program in the 1990s. Alaska’s legislature created a brief explanation of how enrollment should work, allowing the regulatory agency the freedom to determine who should be enrolled in the program. Florida’s legislature, in contrast, defined clearly who should be enrolled and created detailed guidelines for granting exemptions to this rule, thereby constraining regulators’ discretion in implementing Medicaid policy.

With regard to the use of administrative procedures acts, legislators can influence agency discretion by placing legal constraints on the agencies’ regulatory scope and on how they develop and implement policies (Potoski and Woods, 2001; Hecht, 2004). For instance, a cross-state comparison of hydraulic fracking regulations found that Colorado legislators passed fewer administrative procedures acts, resulting in greater agency flexibility in regulating fracking firms (Rinfret, Cook, and Pautz, 2014). In contrast, legislators in New York established strict administrative procedures that required agencies to seek legislative approval before creating rules, and Ohio legislators explicitly restricted state regulatory agencies’ involvement in making rules about fracking.

The rationale for giving discretion to regulatory agencies stems from two important assumptions. First, elected officials who craft public policy often have less information about the policies’ subject matter than do the regulatory agencies charged with implementing them (Gailmard and Patty, 2007). Agencies are generally staffed with technical experts who have more-complete information about the firms being regulated; therefore elected officials may grant greater discretion to more-knowledgeable regulators, resulting in more-effective policy implementation and better policy outcomes (Skocpol and Finegold, 1982; Skocpol, 1985; Huber and Shipan, 2002). Second, because writing detailed public policy takes time and effort, policymakers delegate discretion to regulators by writing policies with vague goals and broad mandates, leaving implementation decisions to the agencies. Hence, in deciding whether to grant discretion and to what degree, legislators balance the risk of regulatory agencies acting in misalignment with policy goals with the cost and effectiveness of implementation.

Key to understanding how discretion can affect regulatory decision making is the recognition that policymakers and regulators have different incentives, which can create a principal–agent tension among regulatory agency officials (the agents) and the elected officials who act as their political principals

(Weingast, 1984). Because elected officials are fundamentally motivated by their desire for reelection, they prefer policies that maximize their political support. As mentioned, incumbent firms can leverage elected officials' incentives for reelection by using corporate political activities, such as financial and informational lobbying, to persuade them to craft policies in firms' favor.

In contrast, regulatory agency officials are not elected, cannot legally receive financial contributions, and often have job protections associated with civil service policies. Thus they are much less likely to be influenced by corporate political activities, such as lobbying and campaign donations. Furthermore, the political science and public administration literatures suggest that regulatory agencies' mission to serve the public interest often motivates their decision making (Kalt and Zupan, 1990; Rawhouser, Cummings, and Hiatt, 2019), and a public service ethos or logic that emphasizes "the interests of the community" influences it as well (Perry and Hondeghem, 2008: 213). Regulatory agency officials are likely "to pursue more equitable outcomes, and to allocate resources where they are most needed" (Keiser and Soss, 1998: 1134), to distribute benefits to more-disadvantaged clients (Keiser, 1999), and to develop relationships with clients that are "personal and emotional, rarely cold and rational" (Maynard-Moody and Musheno, 2000: 334). For example, research conducted in California's public school districts showed that when regulatory agency officials had more discretion, their individual views on fair distribution and social justice significantly affected the final implementation of public policy (Kelly, 1994). Research on epistemic communities—groups of individuals with policy-relevant knowledge who are guided by common values and beliefs—echoes this perspective and suggests that bureaucratic agencies are chiefly motivated to implement policies in ways that enhance societal welfare (Adler, 1992; Haas, 2015) and "balance the scales of justice" in a way that favors the "underdog" (Kay and Jost, 2003; Vandello, Goldschmied, and Michniewicz, 2016).

Given these differences in incentives, ensuring that the agents (regulatory agency officials) act in the best interests of the principals (elected officials) can be difficult. Political science theory suggests that incentive alignment may be accomplished through effective monitoring of agency decisions and administration—that is, agency oversight—in the form of congressional hearings and investigations or legislative policy pronouncements (McCubbins and Schwartz, 1984). When such monitoring is impractical because of the large number of regulatory agency officials and decisions, other mechanisms may be employed, such as rewarding aligned agencies with more resources or sanctioning unaligned agencies, or through *ex ante* design of agency structure and processes such as administrative procedures acts (Weingast, 1984; McCubbins, Noll, and Weingast, 1987, 1989).

Recent empirical studies illustrating the complications involved in achieving incentive alignment have challenged the efficiency of principal-agent relations described in the classic literature (Potoski, 1999). For instance, the view that elected officials are a single, uniform principal may be an oversimplification; rather, they are multiple principals and often have conflicting interests (Shipan, 2004). Another limitation is that some mechanisms described in the classic theory may be ineffective or have limited applicability. For example, exposing and

sanctioning an unaligned regulatory agency may backfire on elected officials and cause the public to doubt their effectiveness (Miller, 2005). Finally, evidence suggests that elected officials are likely to engage in job shirking in their duty to monitor regulatory agencies (Kalt and Zupan, 1990). These problems are particularly acute regarding regulatory actions not at the federal level, as prior literature has emphasized, but at the state and local levels, where multiple regulatory jurisdictions overlap and political principals interact with multiple agents. Political institutions at the state and local levels differ considerably from those at the federal level on several important dimensions, including the availability of policy options and the amount of discretion granted to them (Weingast, 1984). In practice, U.S. state-level government actors play a critical role in policy formulation and implementation, and this is especially true in environmental and social regulatory arenas, where states have considerable authority (Gerber and Teske, 2000).

Discretion and New Venture Entry

Given the principal–agent problem and misalignment of incentives, we believe that discretion plays a significant role in how agencies implement policy that affects firms. As regulatory agency discretion decreases, elected officials can more effectively monitor bureaucratic decisions through agency budgets and policy pronouncements such as legislation and explicit directives that decrease regulatory decision makers' ability to act on their own incentives (McCubbins, Noll, and Weingast, 1987). In this way, bureaucratic decision making becomes more aligned with and accountable to its political principals, resulting in policy implementation consistent with policymakers' intentions (Meyer et al., 2014). To the extent that incumbent firms use corporate political activities to successfully influence elected officials' policy preferences, regulatory decisions might favor incumbent firms when discretion is limited.

Conversely, when regulators have greater discretion, they will be less likely to lose resources or autonomy if agency decisions are not aligned with lawmakers' expectations. Greater discretion can allow regulators to act more in accordance with their own public service motivations and preferences, which may greatly differ from the preferences of elected officials.¹ We propose that greater discretion will benefit new ventures relative to incumbent firms for two reasons: (1) At a minimum, discretion can level the playing field for new entrants relative to incumbent firms by reducing the advantages that incumbent firms enjoy through corporate political activities targeted at regulatory agencies' political principals. (2) At the extreme, discretion may allow regulators to favor new entrants relative to incumbents; because new entrants generally have fewer financial resources and political connections than do other firms seeking regulatory approval, regulators may perceive them as a disadvantaged group meriting favorable treatment (Lipsky, 1980). In addition, given that creating equitable outcomes is an important motivation of public servants, regulators may be more eager to grant regulatory approval to entrepreneurial firms that

¹ We explored the ethos of state agencies involved in hydropower project approval through a comprehensive text analysis of annual reports and mission statements. The results illustrate that state agencies that regulate the hydropower industry exhibit strong adherence to a public service ethos. We present details of this text analysis in Online Appendix D (<http://journals.sagepub.com/doi/suppl/10.1177/0001839220911022>).

have not yet established themselves in the market than to incumbents who already have significant market share.²

Our discussions with agency officials overseeing hydropower licensing supported the notion that discretion can level the playing field between new ventures and incumbents and, in some cases, may tilt the balance in favor of entrepreneurs. A state agency official explained that he was reluctant to place additional requirements or approval conditions on new entrants' applications. He told us that all license applications are "tailored to [state] minimum standards. These kinds of applications are going to get approved, but we put [additional] conditions on them." However, he said, "[P]utting conditions on [entrepreneurial firms] seems unproductive" compared with more-resource-rich incumbent firms that are "doing this for the fourth or fifth time and just want to coast through the process as quickly as possible." A regulatory agency official from a different state explained to us that applicants that appeared more motivated to serve the public interest were viewed more favorably. He viewed new entrants' motivations as more closely aligned with the public interest than those of incumbent firms, and thus he was "more amenable to independent applicants . . . than the big guys." In sum, we argue that greater discretion leads to greater enactment of the public service preference in regulatory decision making and reduces the disadvantages that new ventures face, relative to incumbents, in the regulatory approval process.

Hypothesis 1: Greater regulatory discretion will benefit new ventures by accelerating the time to approval of new venture licenses, relative to incumbent licenses.

Moderators of Regulatory Discretion on New Venture Approval

To home in on the mechanism at the heart of our argument, we next consider how two factors related to the political environment—political competitiveness of state legislative elections and alignment of political party control—may interact with discretion to affect the principal–agent tension and impact regulatory decision making.

Political competitiveness. The competition of local political races may moderate the effect of discretion on the regulatory decision-making process (Hiatt and Park, 2013). Studies have shown that political competitiveness causes elected officials to become more receptive to corporate political influence (Lord, 2000; Hillman, Keim, and Schuler, 2004). When elected officials face tight competition in an upcoming election, they become more responsive to the needs of organized interests. As lawmakers become more responsive,

² The motives of regulators as servants of the public interest who pursue equitable outcomes and allocate resources to disadvantaged clientele are supported by a significant amount of public administration and sociological research, particularly the fields of "street-level bureaucracy" (cf. Lipsky, 1969, 1980, 2010) and public service motivation (cf. Perry and Wise, 1990; Perry, 1996; Perry and Hondeghem, 2008). Some recent research has extended these motivations to agency interactions with entrepreneurs. For instance, a study of Dutch entrepreneurs found that regulatory agencies viewed more-disadvantaged entrepreneurs as less competent and therefore in need of greater small-business assistance. Such entrepreneurs were treated more leniently with respect to tax inspections in an effort to establish fairness (Raaphorst, 2018; Raaphorst, Groeneveld, and Van de Walle, 2018).

they can garner greater support from organized interests, such as financial contributions, which increases the likelihood of winning the election (McDonnell and Werner, 2016). For example, during the 2002 midterm elections, the rivalry between electoral candidates in the U.S. House of Representatives was high in states with steel-related industries. The tight electoral competition significantly increased the bargaining power of U.S. steel producers, which sought increased tariffs on steel imports. Industry lobbyists increased their efforts, and in the months leading to the election, the George W. Bush administration approved the implementation of a 30-percent tariff, solidifying steel industry support for Republican candidates (Bonardi, Holburn, and Vanden Bergh, 2006).

We propose that political competitiveness will affect the principal–agent tension by aligning the decision making of regulatory agencies and their political principals. Elected officials' increased responsiveness to financial contributions and informational lobbying by incumbent firms may prompt such officials to monitor more closely the decisions of regulatory agencies, particularly if those decisions favor new entrants over politically powerful incumbents. Given that regulatory agencies are concerned with maintaining their departmental budgets and autonomy (Carpenter, 2002), tight electoral competitions may cause regulators to worry that closer monitoring by elected officials will reduce their autonomy or restrict their budgets if they do not act in alignment with those officials' policy preferences. As one agency official put it, "The legislature can do a lot of things—they can change laws and all sorts of things to challenge our rulemaking."

The management literature also supports the notion that turbulence in a firm's external environment, such as uncertainty about an upcoming election, can cause an organization to more closely align with the objectives of key resource holders (Battilana and Dorado, 2010). Consequently, greater political competitiveness likely indirectly diminishes the effect of regulatory agency discretion without changing the formally granted flexibility to interpret and implement public policies. As a result, regulatory agencies likely implement policy in greater alignment with elected officials' preferences rather than according to the preferences and incentives of agency bureaucrats, leading to outcomes closer to policymakers' desires. Given that, on average, policymakers likely favor more-politically connected, resource-rich incumbent firms, we argue that political competitiveness should reduce the positive effect of regulatory discretion on new venture market approval.

Hypothesis 2: Increased competitiveness in the political market will negatively moderate the positive effect of regulatory discretion on new venture approval.

Political party control. The alignment of political party control may also moderate the effect of discretion on new firms' entry. When a single political party controls both chambers of the state legislature, the likelihood of successfully passing new legislation increases greatly because policy content is more easily communicated and requires less negotiation and cross-party cooperation (Coleman, 1999). Divided control, in contrast, greatly reduces the likelihood of passing new legislation because ideological differences create bottlenecks: to pass new legislation, elected officials must bargain across party lines on issues

that are often ideologically intractable (McCubbins, 1991). Prior research has also found that divided control makes it more difficult for government to pass legislation in numerous areas, including responding to external shocks, reaching budgetary agreements, and raising taxes (Besley and Case, 2003).

In terms of the effect on the principal–agent tension, political party control likely moderates the effect of discretion in the regulatory decision-making process. When party control is aligned, elected officials can more easily enact laws that restrict regulatory agency budgets or legislatively reduce the amount of discretion agencies enjoy. Regulatory bureaucrats, who would prefer to avoid this outcome, may be more likely to signal to elected officials that such actions are unnecessary and that they will adhere to policymakers' intentions in their regulatory decision making. Divided control, however, reduces the potential threat that elected officials can agree to curtail autonomy and resources or legislatively restrict discretion. As a result, regulators' public service motivations may play a greater role in the decision-making process in agencies endowed with discretion. Political science studies have shown that when government is divided, regulatory agencies are more insulated from the influence of elected officials and from direct and indirect attempts to manage the bureaucracy; when a single party has control, regulatory agencies are more likely to be held accountable for regulatory failures and hence are motivated to maintain closer control of agencies (Lewis, 2004; Melo, Periera, and Werneck, 2010). Similarly, studies of state and municipal governments have shown that single-party governments are often better at encouraging agencies to align their interests with those of elected officials (Spiller and Urbiztondo, 1994; Spiller, 1996). Thus we argue that divided political party control enhances the benefits of discretion on new venture approval:

Hypothesis 3: Divided political party control will positively moderate the positive effect of regulatory discretion on new venture approval.

Empirical Context

The empirical context of this study is the U.S. hydroelectric power sector during the period 1978–2014. Hydroelectric power is the largest source of renewable electricity in the United States (USEIA, 2017), spans all 50 states (see Figure A1 in the Online Appendix, <http://journals.sagepub.com/doi/suppl/10.1177/0001839220911022>), and employs over 300,000 people (NHA, 2017a). The United States is also among the largest producers of hydroelectric power in the world, after China, Canada, and Brazil (USEIA, 2011). Although hydro-power is most frequently associated with very large dams (Reinhardt and Hiatt, 2012), not all U.S. hydropower facilities use dams, and only 3 percent of all dams produce electricity (NHA, 2017b). Other types of hydropower facilities are *diversions* (also known as run-of-river), which channel a portion of a river's water through a canal that contains a turbine to generate electricity; *pumped storage*, which uses an upper reservoir to store kinetic energy during non-peak-load times; and *tidal generators*, which use the rising and falling of the ocean tides to drive turbines near the ocean floor. The U.S. Department of Energy also classifies hydropower facilities by size (large, small, and micro) based on the amount of electricity they can generate (USDOE, 2017b). Most new

hydroelectric license applications during the study period were for non-dam facilities in the small or micro categories.

The study period begins after the passage of the National Energy Act of 1978. Prior to its passage, independent energy entrepreneurs were not permitted to sell electricity to the grid. Instead, electricity was generated by vertically integrated public and private utility companies that controlled generation and distribution in specified geographic areas. Under section 210 of the act, known as the Public Utilities Regulatory Policies Act (PURPA), entrepreneurs were enabled to construct non-utility facilities from which utility companies were required to purchase power at the utilities' generation cost (USDOE, 2017a). Although entrepreneurs could not sell directly to consumers, PURPA required utilities to purchase electricity from non-utility facilities in long-term contracts at predetermined rates. This created a new competitive market for independent power producers that differed from the vertically integrated utility monopolies of the past and resulted in entrepreneurs entering the electricity sector at varying rates (Sine, Haveman, and Tolbert, 2005; Sine and Lee, 2009).

The Federal Energy Regulatory Commission (FERC) regulates all U.S. hydro-power facilities that are not federally owned or operated. To limit private exploitation of public rivers, FERC grants facilities 30- to 50-year licenses and is mandated to give equal consideration to energy and non-energy interests, such as recreational opportunities and environmental quality (FERC, 2014). The license application process involves an initial proposal that identifies environmental, historical, or archaeological issues in the proposed project. Development of this proposal may take a year or more to complete. In consultation with state and federal regulatory agencies, the applicant develops a plan to complete impact studies on these issues. Figure A2 in the Online Appendix offers examples of the types of projects a license application might involve and the types of application elements that could be required for those projects.

The costs of completing these studies depend largely on the nature of the facility site and can range from \$1,000 to \$6,000 per study. Completion of impact studies typically takes one to two years. Public comments are also solicited at this stage. Once this is complete, a formal license application is submitted, including the results of impact studies and detailed descriptions of the facilities, operation, and environmental impact-mitigation measures. FERC reviews these documents and again solicits public comment and responses from other regulatory agencies. The applicant must address issues raised during the comment period, which could extend the process by several years. A license is not granted until all issues are addressed and the facility is built and inspected. Hence the total wait time to obtain a license is often three to five years, in addition to the time required to develop the initial proposal. The total capital cost per kilowatt of developing a new hydroelectric facility ranges from \$2,200 to \$2,700 (USEIA, 2013). Once the facility is established, FERC assesses annual administrative fees that vary by the type and size of facility and total approximately \$1 per kilowatt of facility capacity (FERC, 2014). For small-scale hydro facilities, a full return on investment can occur in as little as five years (Millman, 2013).

Although all hydroelectric facilities must ultimately be granted a license at the federal level by FERC, individual states have the authority to create their own requirements for licensing and relicensing (FERC, 2014). Under sections 401 and 404 of the Clean Water Act of 1972, before a license can be granted,

states must certify to the federal government that an applicant complies with all state water-quality standards. This gives states the authority to affect licensing in two ways: they can indirectly deny a license by withholding certification, and they can impose conditions on a federal license by placing additional limitations on certification (Copeland, 2015). Some state legislatures take advantage of this and empower their various regulatory agencies to create additional restrictions on licensing, while others specifically craft legislation to prevent regulators from creating restrictions greater than applicable federal requirements. One regulatory agency official shared how this is manifested in different states:

I know that the [neighboring state] legislature has to approve the standards and rules made by their agencies, but in our state our discretion to make rules comes from the legislature from legislative acts. There's no legislative approval process for our agency outside of those acts.

Both the number and type of state regulatory agencies vary by state: they can range from one to seven and include state departments of environment, natural resources, state lands, fish and wildlife, parks, and agriculture, among others; see Figure A3 in the Online Appendix. This creates significant variation across states regarding regulatory agencies' discretion to interpret and implement licensing legislation.

METHODS

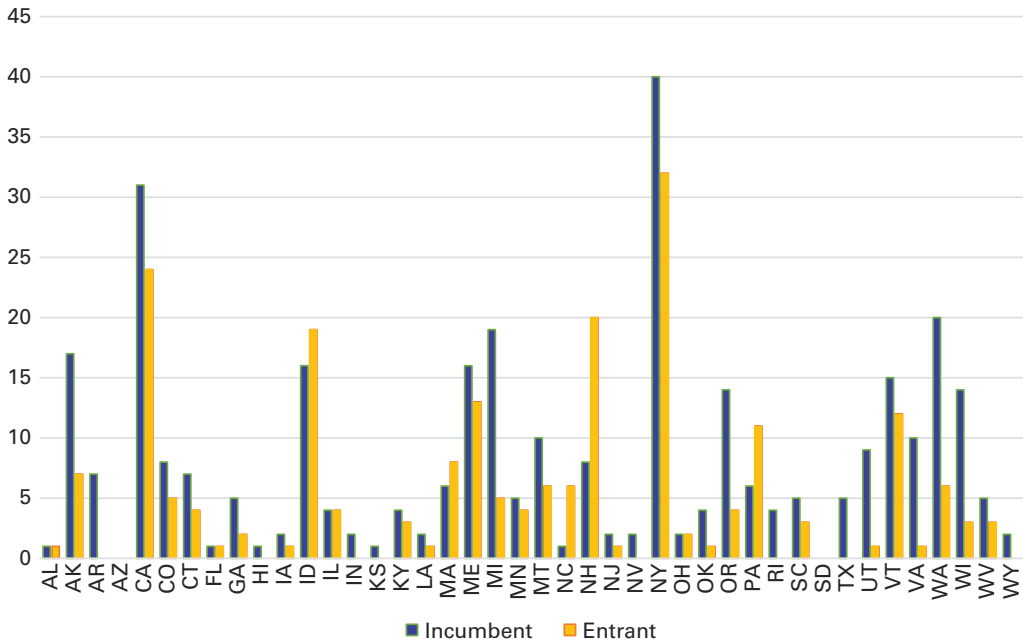
Data

Our data contain all hydroelectric facility license applications and submitting organizations from 1978 through 2014. Figure 2 shows how many applications were received in each state during the total sample period. Figure A4 in the Online Appendix illustrates how many applications were received in all states during each year of the sample period. We obtained these data from FERC's docket library. During this period, 525 license applications were submitted by 413 potential licensees. Of these, 91 percent (478) were licensed, 5 percent (27) were withdrawn or rejected, and 4 percent (20) were still awaiting approval at the end of the study period.³ The average wait time for a regulatory decision was 1,627 days, and the maximum was 7,494 days. The firms in the data set range from large, publicly traded multinational corporations to very small partnerships and individuals applying for small-scale hydroelectric licenses.⁴ We obtained information on organization type (publicly traded corporations vs. private firms), founding dates, and headquarters location from the OpenCorporates database, which sources data on U.S. firms from each

³ The data include the license application; issue, withdrawal, and rejection dates; operational startup/shutdown dates; project size (in MWh); facility location; facility type (hydroelectric dam, run-of-the-river, or pumped storage); and waterways used.

⁴ Although the FERC docket library contains data on license applications by publicly traded and private for-profit firms, cooperative firms, and municipal and tribal governments, only publicly traded and private for-profit organizations and electric cooperatives were included in the sample. We excluded government- and tribal-owned facilities because they employ different strategies (e.g., they do not lobby with campaign contributions) and have a level of access to other public agencies that non-government organizations do not.

Figure 2. New hydroelectric facility license applications by state during sample period, 1978–2014.



state's business registry. We also obtained self-reported information on organization type, founding, and headquarters from corporate websites.⁵

We focus on state-level regulatory agencies rather than federal agencies for several reasons. First, for most businesses, state regulatory agencies are a more frequent point of contact than are federal agencies (Sabatier and Mazmanian, 1980). Second, compliance with state-level regulations is often more onerous than with federal regulations (Ungson, James, and Spicer, 1985) and is therefore a more important source of influence over firms' activities. Third, state-level agency approval is a prerequisite for obtaining a FERC license in this sector.

Dependent Variable

Regulatory approval. The dependent variable is license approval of hydroelectric facility projects (0 if not approved, 1 if approved). After an approval, withdrawal, or denial event, the permitting case is dropped from the data set.

⁵ Most firms in the sample are not publicly traded, and, because of the longitudinal nature of the data, many no longer exist. Therefore, much of the demographic data ordinarily used in this type of analysis (such as profitability) were unavailable for many firms. To the extent possible, we identified the ultimate owner of each project by using the firm's name and searches of legal subsidiaries of corporations and LLCs.

Predictor Variables

New entrants. For this study, we define new ventures as *de novo* entrants: entrepreneurial startups originating in the hydroelectric power industry that have not previously received a license approval. *New entrant* is coded as a dummy variable (1 for new entrants and 0 otherwise) and is interacted with the predictor variable *regulatory discretion* in the analysis. In our sample, 39 percent of new licenses are coded as new entrants.

Regulatory discretion. Regulatory discretion is a variable that has traditionally been examined in the political science and public administration literatures through formal modeling.⁶ Although some studies have attempted to operationalize discretion in empirical analyses, few lend themselves well to a multi-state, longitudinal study. In operationalizing this measure, we borrowed a construct from the political science literature that works well for longitudinal, multi-state studies. Specifically, we used a weighted index, developed by Hecht (2004), of various private property rights acts (PPRAs) that vary by state and year. PPRAs are pieces of legislation that constrain agencies from making rules limiting owners' use of private property; they attempt to balance the necessity of some legitimate regulation with the possibility of excessive government interference in owners' ability to use their private property.⁷ These acts function as *ex ante* administrative procedures, which are legal constraints on agency decision making (Potoski and Woods, 2001). The purpose of these procedures is to hardwire agencies' decision making so that future decisions reflect the preferences of the legislators who enacted the procedure (McCubbins, Noll, and Weingast, 1987, 1989; Potoski and Woods, 2001; Woods, 2018). Thus administrative procedures such as PPRAs reduce agency discretion and enhance the policy influence of the legislators who enacted the procedure.

Prior research has identified PPRAs as suitable constructs for discretion, which is often difficult to measure directly, because they measure regulatory agencies' flexibility in interpreting and implementing public policies (Hecht, 2004; ELI, 2013). The law and economics literatures have identified PPRAs as measures that "legislatively preclude [regulators] from taking added actions, . . . even if they had the desire to do so" (Wagner, 2005: 224), by decreasing regulatory agencies' scope of regulation and constraining their latitude to implement policies, issue permits, or enforce statutes beyond federal minimum standards (Lingle, 2010; Brown, 2011; Owen, 2017). The Environmental Law Institute (ELI) has used this index as a measure of discretion for the approval or denial of permits for facilities that affect state water bodies per the Clean Water Act (ELI, 2013). Our conversations with agency officials reinforced the idea that such statutes limit their autonomy or discretion. One official said that discretion "varies from state to state. Some statutes are very specific, so they give less

⁶ See Online Appendix B for a discussion of this variable and how we constructed the index.

⁷ In general, PPRAs require state regulatory agencies to evaluate whether a rule will cause a *taking* and to implement safeguards to ensure that agency actions do not cause this to occur. A regulatory taking occurs when a regulatory policy deprives the property holder of economically reasonable use of the property. In the context of the hydroelectric sector, regulatory agencies consider the potential upstream or downstream impacts on private property as part of the welfare considerations.

room for the department to implement rules. Different statutes limit our autonomy.” Another official expressed how a lack of restrictive statutes empowered their use of discretion: “Our authority is vague in state code, and oftentimes it says outright that our department has the authority to select what the administrative code should be.”

Our discretion measure is a composite index that distills 13 attributes of 20 different property rights acts into a single index that weights rules according to their severity. These attributes include laws that reduce the threshold for defining a regulatory *taking* (an event that occurs when a regulatory policy deprives a property holder of economically reasonable use of their property), the degree to which property rights acts affect regulatory agencies and local government decision making, and whether decisions require external review. The index ranges from 0 to 100; a high score indicates that state regulators have little discretion in preventing property owners from using their property as they see fit, and a low score indicates great flexibility in making regulatory decisions. For the purpose of our analysis, we reverse-coded this variable so that 100 represents the highest possible amount of discretion, whereas 0 represents the lowest amount of discretion. Online Appendix B explains in detail our measure of discretion, and Figure B1 illustrates the variation in discretion across states.

Political competitiveness. For the lower- and upper-chamber legislative levels, we used the percentage of seats by which the dominant party held a majority; for gubernatorial (executive) elections, we used the margin of victory. Following prior research, we coded the political competitiveness as high if the margin of victory was less than 5 percent for gubernatorial elections (Bonardi, Holburn, and Vanden Bergh, 2006). We extended this logic to legislative seats and coded the political competitiveness as high if the margin by which the dominant party in that chamber held a majority was less than 5 percent. With such slim margins, the pressure to secure re-election—and therefore responsiveness to organized interests—would be high, as a loss of seats would risk losing party control of that chamber. Political competitiveness for gubernatorial and upper- and lower-chamber elections are dummy variables coded as 1 if *political competitiveness* is high and 0 otherwise. We obtained these data from U.S. Census Bureau Statistical Abstracts.

Political party control. For each level of government—the legislative chambers and executive—we coded for dominant party control. When the same political party controls the legislative and executive levels of government, political control is united; when the same party does not control them, political control is divided. This is coded as 1 if state government has *divided control* and 0 otherwise. We obtained these data from the National Conference of State Legislatures.⁸ All the predictor variables were lagged by one year.

Control Variables

Firm-level variables. We controlled for *firm type* (for public for-profit firms, private for-profit firms, and cooperatives, coded as two dummy variables) and

⁸ Retrieved from: <http://www.ncsl.org>.

firm age since legal incorporation, using data from the OpenCorporates database and corporate websites. We used the total size of the firm's electric generation facilities measured in megawatts (MW) as a proxy for *firm size*. To capture the potential impact of organizational capabilities pertaining to interactions with regulatory agencies, we also controlled for each firm's *regulatory experience* by counting the cumulative number of permits held. We obtained these data from the Energy Information Administration database and FERC docket library.

State- and federal-level variables. We included controls for *state population* and per capita *gross state product*, obtained from the U.S. Census Bureau. We controlled for annual state *unemployment rate*, obtained from the Bureau of Labor Statistics. We also controlled for the annual average state *commercial energy price* and number of hydroelectric-specific *energy incentives* to capture potential economic returns to investment in hydropower facilities. We obtained these data from the Energy Information Administration database and the Database of State Incentives for Renewables and Efficiency (DSIRE).⁹ Following prior research (York, Vedula, and Lenox, 2018), we controlled for the level of business friendliness by including each state's tax burden, which we obtained from the Tax Foundation.¹⁰ We included the dominant political party at state-level upper (*upper-chamber party*) and lower chambers (*lower-chamber party*) as well as the executive (*governor party*). We also controlled for the political party of the *U.S. president* in case state regulators choose to resist or oppose federal policy agendas. We obtained these data from the U.S. Census Bureau Statistical Abstracts. Following prior research (Doshi, Dowell, and Toffel, 2013), we controlled for pro-environmental sentiment by using the average of the state's elected officials' League of Conservation Voters Scorecard (*LCV*), which scores annually the pro- or anti-environmental sentiment of federal legislators in each state.

Project license-level variables. To address concerns that new entrants are simply developing much smaller and easier-to-approve projects than incumbent firms, we controlled for the size of the proposed facility (*facility size*). We controlled for formal objections to license applications and lawsuits from facility stakeholders. We obtained from FERC's docket library formal objections made by incumbent firms already operating in the industry (*incumbent objections*); by external stakeholders, such as environmental activists or individuals with similar concerns over fish and wildlife habitat or water quality (*stakeholder objections*); and by others (*other objections*) who do not fit in the previous categories, such as the various state and federal regulatory agencies with shared responsibility for waterway protection (e.g., state fish and wildlife departments, the U.S. Environmental Protection Agency). We used the following terms when searching for and coding objections: objection, investigation, concern, opposition, protest, petition to intervene, and motion to intervene. We also searched

⁹ The DSIRE (www.dsireusa.org) database is operated by the North Carolina Clean Energy Technology Center at North Carolina State University and funded by the Department of Energy.

¹⁰ The Tax Foundation (www.taxfoundation.org) is an independent tax policy non-profit. A state's tax burden is calculated as the total state and local taxes divided by total state income.

the names of major environmental groups active in hydropower opposition, such as Ducks Unlimited, Trout Unlimited, American Rivers, and the Audubon Society. After identifying the objections, we categorized them according to the individual or group making the objection. This variable is a running count of the objections identified in each category. Finally, to control for potential differences in the perceived quality or riskiness of the projects under review, we included binary variables for the following DOE hydropower types: dam, pumped storage, run-of-river, and tidal power.¹¹

Agency-level variables. Prior research has suggested that increasing the number of decision makers decreases the likelihood of successful policy implementation because it expands the number of decision points (Pressman and Wildavsky, 1984). To address this, we controlled for the *number of agencies* involved in hydropower licensing in each state (see Figure A3); the mean number of agencies was two, the minimum was one, and the maximum was seven.¹² This information came from the Environmental Protection Agency's (EPA) ECHO database. We also included the number of *applications under review* in the state each year.

To address the variation in the intensity of regulation, which may affect the difficulty of obtaining a license across states, we controlled for the *frequency of enforcement* of Clean Water Act (CWA) violations at the state level, which prior research has identified as a useful proxy for regulatory intensity (Kahn, 1997; List, McHone, and Millimet, 2003). This variable is a count of all CWA enforcement actions in each state per year either by state regulators or the EPA. To further control for differences in regulatory intensity across states, we included a running count of the number of *state laws* that pertain to sections 401 and 404 of the CWA (the sections of the act that affect hydroelectric facility licensing at the state level). State agencies may also vary in their capacity to implement and enforce laws (Skocpol, 1985; Simons and Ingram, 2003), and this may affect both the difficulty of obtaining a license and regulatory agencies' ability to act on their regulatory discretion. To control for this, we included the frequency of *local enforcement* of all types of environmental regulations by state agencies. Whereas the *frequency of enforcement* variable captures EPA enforcement of hydropower-specific regulations, *local enforcement* more broadly captures state environmental agencies' capacity to carry out their missions. We obtained these variables from the EPA's ECHO database. In addition, we controlled for a major piece of federal legislation that may affect

¹¹ Some facility types may have greater inherent uncertainty than others due to their novelty and innovativeness. For example, tidal power is a relatively new technology that is yet unproven outside of Europe. Run-of-river facilities are a proven technology but require construction of diversion canals, which may make regulatory approval more uncertain. Pumped storage and dams—which in our data set consist of retro-fitting flood control facilities to produce electricity—are proven technologies that are not particularly innovative, and thus the quality of the projects would be less uncertain.

¹² In analyses not reported here, we also examined whether heads of regulatory agencies are political appointees or career bureaucrats, in case politically appointed regulators themselves are motivated to adjust their regulatory decisions according to electoral cycles. We ran a split-sample analysis of states in which all agency heads are politically appointed versus those states in which they are not all appointed, and we found the results to be unchanged. We obtained this information directly from the agencies.

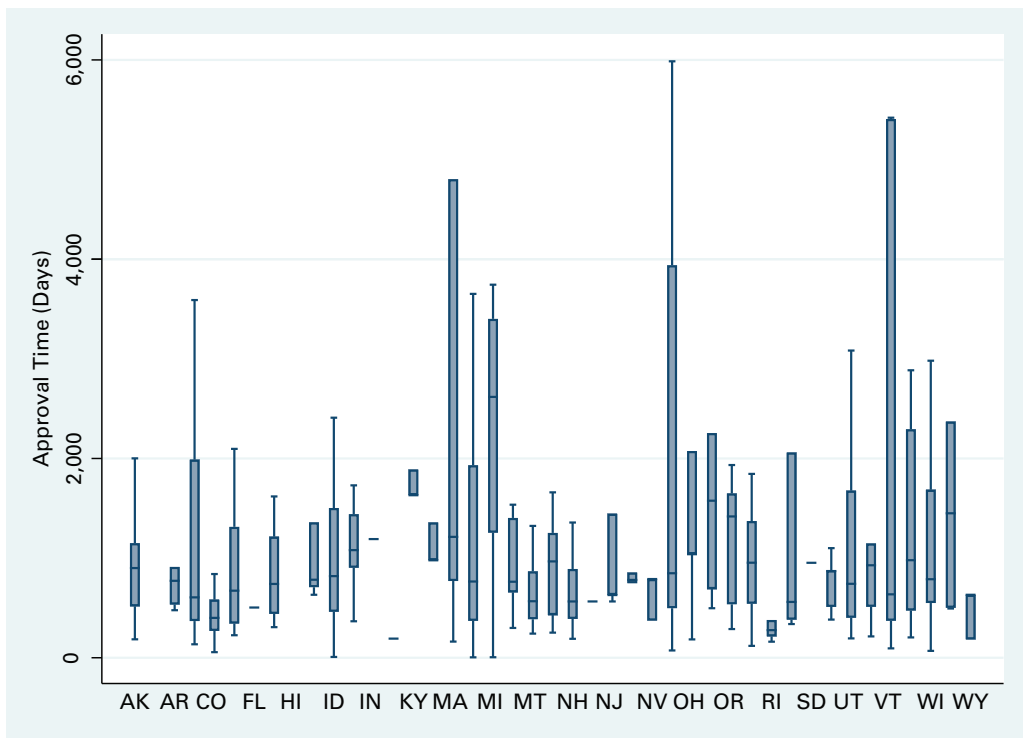
hydroelectric facility licensing: the Electric Consumers Protection Act of 1986 (ECPA). The ECPA increased FERC’s regulatory and enforcement powers, augmented the importance of environmental considerations in the licensing process, and expanded the role of state regulatory agencies. This is a dummy variable, coded as 0 in years before enactment and 1 in the year of enactment and beyond.

We also included the cumulative number of *lawsuits* in each state surrounding hydroelectric power facilities, as they may be another tactic that incumbent firms or external stakeholders use to affect license approval. We obtained data on lawsuits from the LexisNexis legal database, using hydro-power, hydroelectric, pumped storage, run-of-river, tidal power, dam, case, against, lawsuit, and court as search terms. The data included information on the parties involved in the suit, details of the complaint, and how the suit was resolved. We matched the lawsuits to specific facilities identified in the FERC docket library to create a cumulative number of lawsuits affecting each hydroelectric power facility. In total, we identified 68 lawsuits affecting 102 facilities.

Analysis

Because 91 percent of licenses are eventually approved, and because the approval time can vary from one to over 20 years as shown in Figure 3, we used an accelerated failure time (AFT) model to measure license approval (Mitchell, 1989; Kapoor and Adner, 2012). The AFT model takes the form

Figure 3. Box and whisker plot of approval time by state.



$$\log(t_j) = X_j\beta_x + z_j$$

where t_j is the firm's observed time to license approval, X_j is a vector of covariates, β_x is a vector of regression coefficients, and z_j is the random error term that has a specific distribution depending on the parametric assumption about the baseline hazard function. Several different parametric forms of the hazard function are available; we conducted exploratory analyses to determine which distribution was most appropriate, including applying the Akaike Information Criterion and Schwarz's Bayesian Information Criterion tests to differentiate models. These analyses determined that the AFT Weibull distribution was the best fit, although estimates of the influence of our independent variables were consistent across lognormal, loglogistic, and exponential distributions, suggesting that our results are not an artifact of a particular distribution.¹³ We used maximum likelihood estimation and the Huber–White sandwich estimator of variance, which adjusts standard errors to account for multiple observations per year.

To minimize collinearity on interaction terms between the regulatory discretion variable and predictor dummy variables, we standardized the regulatory discretion variable. We tested for multicollinearity and found that all variance inflation factors in the analysis were 5 or less and that most were near 1, suggesting an acceptable level of multicollinearity. We also used clustered standard errors at the state level because observations within each state are unlikely to be entirely independent. Additionally, we ran shared frailty models by state and found the results to be consistent with clustered models reported below.

RESULTS

Descriptive statistics and bivariate correlations appear in Table C1 in Online Appendix C, and the results of the accelerated failure time (AFT) models appear in Table C2. Model 1 of Table C2 shows the effect of control variables only, and Model 2 adds the effect of regulatory discretion. Model 3 shows the effect of entrants alone, and Model 4 adds entrants, regulatory discretion, and their interaction to test Hypothesis 1. Models 5–10 test Hypothesis 2, which examines the moderating effect of political competitiveness on regulatory discretion and new venture approval. We tested this hypothesis at three levels of government: the upper house, the lower house, and the executive. Models 5 and 6 in Table C2 examine the effect of the upper house by first looking individually at the two-way interactions between political competitiveness, regulatory discretion, and new ventures and then by interacting all three variables. Models 7 and 8 do the same for the lower house, and Models 9 and 10 do the same for the executive. Models 11 and 12 test Hypothesis 3, which examines the moderating effect of divided political control on regulatory discretion and new venture approval. We tested this first by looking individually at the two-way interactions between divided control, discretion, and new ventures and then by interacting all three variables.

Several control variables had a significant effect on facility licensing. Cooperative firms were licensed much more quickly than privately held companies, and facilities

¹³ Post-estimation proportionality tests found no violation of the proportionality assumption.

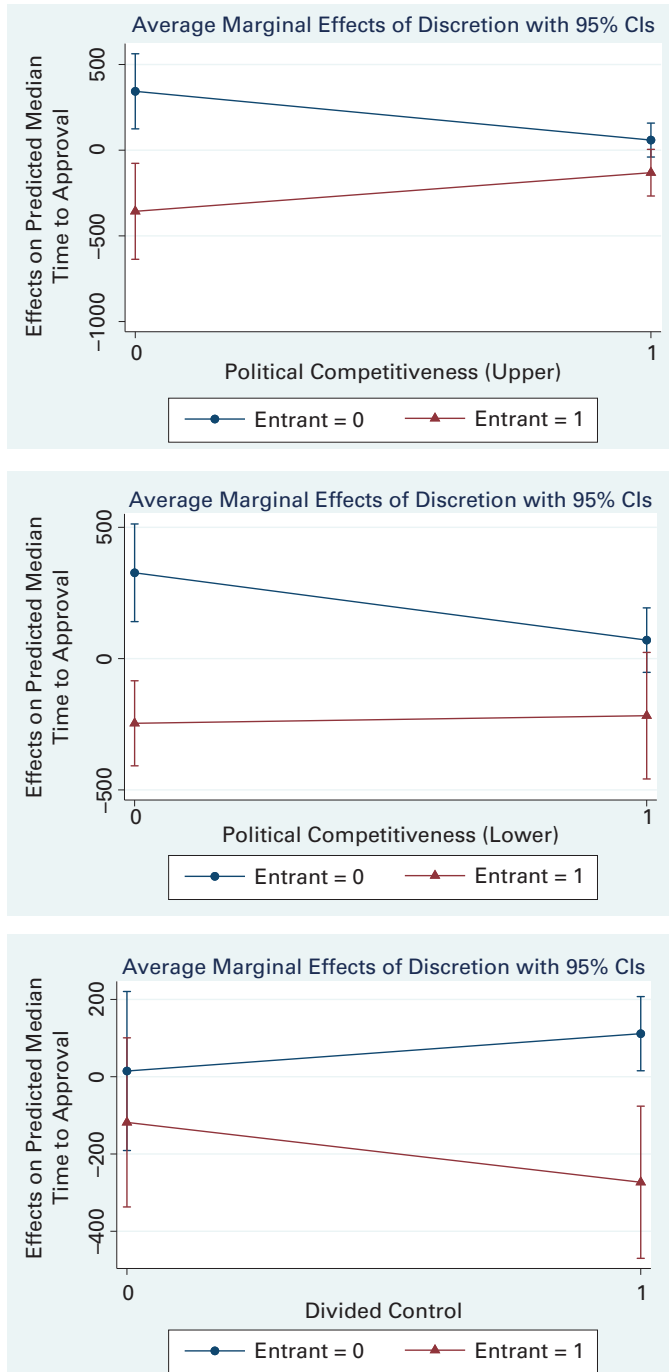
that operated dams or tidal power plants were licensed much more quickly than run-of-river facilities. A firm's size and age had statistically significant but substantively very small positive effects on time to approval. At the state level, gross state product per capita and number of licenses currently under review also had statistically significant but substantively very small effects on time to approval. The frequency of local enforcement of environmental regulations (our control on state agency capacity) accelerated time to approval, suggesting that states whose agencies have greater capacities to carry out their functions approve licenses more quickly. In some models, the frequency of Clean Water Act enforcement was statistically significant, but the effect was substantively very small. A higher unemployment rate accelerated time to approval. When the U.S. president was from the Republican Party, licenses were approved much more slowly. Formal objections by other regulatory agencies and lawsuits had a negative effect on the time to license approval. Objections by external stakeholders and incumbent firms had no effect on licensing, which is a surprising result. Lastly, Democratic Party control of the lower house had a positive effect on the time to license approval.

The results provide strong support for Hypothesis 1, which predicts that regulatory discretion will increase the likelihood of new entry. Regulatory discretion alone had no significant effect on regulatory approval. But when regulatory discretion was interacted with new entrants, the results show that regulatory approval was obtained 22.5 percent ($p = .000$) faster than approval for incumbent firms, for each one-standard-deviation increase in the level of regulatory discretion. The results also support Hypothesis 2, which predicts that competitiveness in the political market will negatively moderate the positive influence of discretion on new-entrant licensing. When interacted with entrants and discretion, political competitiveness in the upper and lower chambers of the legislature increased the time to regulatory approval by 57.4 percent ($p = .010$) and 50.6 percent ($p = .020$), respectively. The effect of executive competitiveness is not statistically significant. The executive branch generally has very little direct responsibility for overseeing regulatory agencies, so its electoral competitiveness may be less likely to indirectly affect the licensing of new entrants. This is consistent with prior political science research showing no evidence of gubernatorial influence over state agency decision making (Gerber and Teske, 2000). Our results also support Hypothesis 3, which predicts that divided political party control will positively moderate the effect of discretion on the likelihood of new-entrant licensing. The main effect of divided political party control had no significant effect on licensing, but when this control was interacted with discretion and entrants, the time to regulatory approval decreased by 26.7 percent ($p = .001$) for each one-standard-deviation increase in regulatory discretion. Figure 4 illustrates the interaction effects for Hypotheses 2 and 3.

Corporate Political Influence

We argued that greater discretion would at a minimum benefit new entrants relative to incumbent firms by reducing the political influence of incumbents, thereby leveling the playing field. Given the nature of regulated markets, incumbent firms are likely to take nonmarket actions, such as lobbying and financial contributions to legislators, to enhance their ability to obtain licenses (Ridge,

Figure 4. Interaction effects.



Ingram, and Hill, 2017). To address this, we conducted additional analyses on the effect of corporate political contributions on the likelihood of and time to license approval. We used data on financial contributions and informational lobbying from the National Institute on Money in State Politics, a non-partisan, non-profit organization that collects comprehensive lobbyist and other information from government disclosure agencies. This database provides information on annual financial contributions by individual firms to state-level elected officials per state per year. The data include financial contributions from 1990 through 2014. The results, not shown here, reveal that corporate contributions improved both the likelihood of license approval (29.2 percent increase, $p = .018$) and the time to licensing (14.7 percent faster, $p = .027$). However, when political contributions were interacted with our measure of regulatory discretion, the likelihood of approval decreased by 28 percent ($p = .040$), and time to approval increased by 22.4 percent ($p = .042$).¹⁴ We believe that these results further support our mechanism that regulatory discretion enhances the principal-agent tension, as increased regulatory discretion counteracted efforts to use political contributions to gain advantage at the legislative level.

Regulatory Capture

We also examined the potential of regulatory capture and agency discretion, as one could argue that firms are more likely to capture regulators when they have greater discretion (Dal Bó, 2006). We do not believe that capture is a major factor influencing regulatory decision making in this context, for two reasons. First, political science research suggests that capture is much less likely to occur in an industry that has oversight by multiple agencies because various bureaucrats from different backgrounds, interests, and institutional perspectives must be simultaneously influenced. This massive coordination reduces the likelihood that any single interest group might capture the entire regulatory decision process (Barkow, 2010; Livermore and Revesz, 2012). Moreover, even if a firm successfully captured a single agency, the challenges of cross-agency coordination would dampen any bias introduced by the captured agency (Zinn, 2002).¹⁵ In the hydroelectric power sector, not only are both state and federal agencies involved in the decision-making process, but the mean number of agencies at the state level (which we controlled for in our analyses) is two (see Figure A3). Second, because capture is most likely accomplished by resource-rich, politically powerful firms that can offer regulators a financial reward to rule in their favor, we would expect those firms to be more likely to obtain favorable regulatory rulings when regulators have more discretion. But our main results and robustness tests showed the opposite: increased discretion appeared to favor less politically powerful firms.

¹⁴ In our data set, most contributions come from incumbents, with a handful of entrants contributing small amounts. The mean contribution from new entrants in our data is \$80, whereas the mean contribution from incumbent firms is just under \$10,000. Moreover, these results hold if we restrict the analysis to only incumbent firms.

¹⁵ Empirical studies that have found evidence of regulatory capture have examined only a single regulatory agency, and to our knowledge, none have discovered capture of multiple agencies. Indeed, research suggests that having multiple agencies share regulatory jurisdiction insulates them from capture (Levine and Forrence, 1990; Carpenter and Moss, 2013).

Robustness Checks

We also conducted several robustness tests to address model robustness, rule out potential alternative explanations, and offer further evidence for the mechanism of discretion.

Model robustness. A potential concern with event-history analysis is that we cannot account for unobserved differences across states that may systematically affect regulatory approval. To alleviate this concern, we used a fixed-effects ordinary least squares (OLS) panel regression to account for time-invariant state-level endogeneity. The results are consistent with the event-history models, suggesting that state-level endogeneity is not problematic.¹⁶ We also ran random-effects models and performed a Hausman test comparing the estimates from the random-effects and fixed-effects models. The null hypothesis that the state effects are random was rejected (chi-squared = 288.46, $p < .001$).

Legal losses. It is possible that as regulatory agencies lose lawsuits, precedents could be created that moderate the proposed link between discretion and the enactment of agency official preferences. To test this, we coded for whether the regulatory agency, the firm, or an external stakeholder won a particular suit. The results, not shown here, reveal no evidence that a regulatory agency winning or losing a lawsuit had a later impact on the discretion effect.

Agency perception of monopolies. One could argue that low competition in a state's electricity production market indicates state agencies' predisposition to favor large incumbents over new entrants. To address this, we created a Herfindahl measure of market competition, using all the hydropower plants operating in a state and year, and we interacted this variable with discretion. The results showed that neither the Herfindahl index nor the interaction term with discretion had any significant effect on market approval of new entrants. Conversations with regulatory agency officials support this empirical result. When asked about the agency's most salient regulatory concerns, one official expressed that energy markets were not a primary consideration: "We review every permit or license to determine impacts on water quality, in particular that construction and operations will meet our standards. Grid concerns don't really manifest themselves except to the extent they affect water quality or discharge." Another added, "It's primarily on water quality and also compliance with other [agency] requirements like Fish and Wildlife and impacts on water rights."

Outliers. Given that license approval can vary from one to over 20 years, we were concerned that outliers may have driven our accelerated failure time results. To rule out this possibility, we ran our analyses using the parameters of no licenses with extremely long wait times (over eight years) and found results

¹⁶ Note that due to a lack of sufficient variation, 24 states were dropped from the fixed-effects analysis.

consistent with our main models. A related concern may be that new ventures apply to create smaller projects that are simpler to approve and that some very large incumbent facilities that are more difficult to approve have driven the results. We do not believe this to be the case: the average size of new venture facilities (5348 kW) and incumbent facilities (7334 kW) is very similar. Furthermore, entrants and incumbents apply for licenses of the same size category at roughly the same rates. The U.S. Department of Energy (DOE) categorizes facilities under 100 kW as micro hydro and facilities under 10,000 kW as small hydro. In our sample, 16.69 percent of new entrants are categorized as micro, compared with 13.59 percent for incumbents; 70.22 percent of new entrants are categorized as small, compared with 62.78 percent for incumbents. While new entrants' facilities are smaller than incumbents' facilities, they are very similar in both average size and DOE category. To further address concerns that very large incumbent facilities drive our results, we ran analyses that excluded very large facilities, and our results hold.

Additional tests of the discretion mechanism. To show further evidence that regulatory discretion allows regulatory agencies to act in line with their own incentive to serve the public interest, we examined the effect of firms' location of operations on regulatory approval. If regulatory discretion does allow agencies to implement policies according to their own preferences emphasizing the local community's social welfare, we would expect that as state agency discretion increases, firms headquartered and operating solely within that state's jurisdiction would benefit more than firms from other states. To explore this possibility, we created a dummy variable for firms that operate only in the state of application. Organizations that have past or current licenses or license applications in multiple states are likely considered outsiders, relative to those firms that were established and operate only in the state of application. When interacted with regulatory discretion, local firms were more likely to be licensed (30.1-percent increase, $p = .005$) than were non-local firms and were more likely to obtain a license faster (by 15.9 percent, $p = .005$). We believe this provides additional support for the notion that regulators with greater discretion more likely make regulatory decisions according to their own motivations and incentives rather than those of their political principals.

Alternative measure of discretion. Conducting an additional check on the effect of discretion on new venture entry, we tested our hypotheses by using another measure of discretion from Hecht (2004): No More Stringent Rules (NMSR). These are pieces of legislation mandating that state agencies may not impose environmental regulations more stringent than those imposed by the federal government. State legislatures create NMSRs to prevent agencies from creating additional rules that might run counter to legislative interests. Because the basis for state agency jurisdiction over hydroelectric power plants is implementation of water quality laws, legislative acts that limit the flexibility of a state agency to implement environmental laws would be a reasonable measure of discretion. Like PPRAs, NMSRs legislatively preclude regulatory agencies from acting on their own interests in matters of environmental rulemaking, even if they are motivated to do so. Analyses using NMSRs in lieu of PPRAs produced results consistent with our main results.

DISCUSSION

This paper explores an underexamined area of institutions and entrepreneurship research by addressing how institutional factors can enable new entrants to overcome barriers to entry in highly regulated markets. Although empirical evidence has shown that some new ventures successfully overcome these barriers (Sine and Lee, 2009), research thus far has neither theoretically nor empirically examined the political institutional factors that may underlie the heterogeneous entry of new ventures into regulated markets. By highlighting the principal-agent tension that exists between policymakers and policy implementers and showing how discretion can exacerbate this issue, we argue that the barriers to entry in regulated markets are more malleable than previously believed and that they can vary in the absence of policy changes.

Our results show how variation in state regulatory agencies' discretion to differentially interpret and implement policies crafted by elected officials affects both incumbent firms and new entrants. Incumbent firms often use corporate political activities to influence elected officials and maintain barriers to entry for new firms. When state agencies have little discretion, elected officials can better monitor regulatory decision making, which prevents agencies from acting according to their own motivations and fosters decision making consistent with the policy preferences of their political principals. But we show that the principal-agent tension between elected officials and regulatory agencies can result in a more level playing field for new entrants when those agencies have greater discretion to enact policies. Greater discretion allows regulators to act in accordance with their public service motivation and incentive to implement policies equitably for disadvantaged groups, thereby leading to greater new venture entry and reducing the advantages for incumbent firms. Barriers to entry resulting from policy thus become less rigid and more malleable when regulatory agencies have greater discretion.

In addition, we find that political competitiveness and political party control moderate the effect of discretion on regulatory agencies' ability to follow their own policy preferences rather than those of their political principals. Political competitiveness indirectly reduces the effect of regulatory discretion on new venture entry by causing regulators to align their decision making with elected officials' interests, which often align with the interests of incumbents. Facing tight reelection campaigns, elected officials become more receptive to corporate political influence strategies and, to ensure alignment with their policy preferences, will more closely monitor regulatory agency decisions. Divided political party control, in contrast, positively moderates the effect of regulatory discretion on new venture entry by reducing elected officials' ability to enact policies limiting agency budgets or autonomy, thereby enhancing regulatory agencies' ability to make regulatory decisions according to their own incentives. In additional analyses, we find that local concentration of firms' activities moderates the effect of discretion. Because professional logics that prioritize local conditions influence regulatory decisions, firms that are more locally concentrated within state agencies' jurisdictions are more likely to gain regulatory approval when there is more agency discretion.

This study makes numerous theoretical contributions. Primarily, it contributes to the institutions and entrepreneurship literature (Nelson, 2014; Cobb, Wry, and Zhao, 2016; Eesley, 2016; Zhao and Wry, 2016) by exploring

how regulatory agency discretion can moderate the effect of institutional pressures on entrepreneurs. Taking a pluralistic view of democratic governments, we examine how the principal–agent tension between lawmakers and regulators can influence government agency decision making, depending on the degree to which elected officials monitor and constrain regulators' decisions. By illustrating how different institutional arrangements lead to more or less favorable outcomes for entrepreneurs, we enhance understanding of market entry dynamics in which the administrative state plays a significant role. Given our results, we invite management and entrepreneurship scholars to pay closer attention to the mechanisms by which different state structures and institutional arrangements affect organizations, to account for varying geographic patterns of market entry.

Moreover, our theoretical analysis and empirical results bring insights from the political science and public administration literatures to organization theory. The state has an undeniable role in shaping organizations, yet most research on organizations has treated the state as reflecting the interests of capital or powerful interest groups (Fligstein, 1990; Dobbin, 1992; Ingram and Simons, 2000). Our study reconceptualizes state officials as agentic, autonomous actors with their own motivations and incentives, who may pursue their own goals independently of other social actors or of the elected officials in power (Evans, Rueschemeyer, and Skocpol, 1985; Kalev, Shenhav, and De Vries, 2008). We show that different institutional arrangements shape the capacity for state intervention in markets by enabling or constraining state officials' ability to act on their own motivations and incentives. In doing so, we find support for Evans' (1995) notion of "embedded autonomy" in that state leaders' and bureaucrats' ties to society are not necessarily a source of dependence and lack of agency but can provide channels of values and information that enhance state actors' ability to implement their goals.

The results also contribute to the business–government–relations literature by shedding light on the multiple political levels and interests that often exist in tension with one another in government (Hillman and Hitt, 1999). We address scholarly calls to dive deeper into the relationship between regulators and regulated firms by moving beyond the view of political influence as a dyadic interaction between suppliers and demanders of public policy and instead focusing on regulatory agencies' implementation of public policy (Hiatt, Carlos, and Sine, 2018). While a large body of research has modeled the behavior of firms, legislators, and regulatory agencies as self-interested, atomistic market actors seeking to maximize their personal utility (Holburn and Vanden Bergh, 2008), others have questioned this approach because it ignores the important role of social influence on regulatory decision making (King, Felin, and Whetten, 2010; Hiatt and Park, 2013). By directly examining not only regulatory agency officials' discretion but also the principal–agent tension that drives their decision making, this study takes a more nuanced approach to the study of business–government relations.

Our supplemental analyses also speak to the effectiveness of firms' political activities (Mizruchi, 1992; Ridge, Ingram, and Hill, 2017; Kim, 2019). Recent research has questioned whether simple measures of numbers of lobbyists or campaign contributions are sufficient to explain outcomes for firms (Hill et al., 2013). Despite ample research, findings on the effectiveness of corporate political contributions conflict: some studies show a positive relationship (Alexander,

Mazza, and Scholz, 2009), while others show a negative (Hadani and Schuler, 2013) or not statistically significant relationship (Hersch, Netter, and Pope, 2008). Our supplemental analyses suggest that future studies should account for institutional factors such as the relationship between elected officials who craft policy and the regulatory agencies that implement it. Discrepancies related to the effectiveness of corporate political activity in prior studies may be due in part to agency discretion, which has not been examined until now.

Our findings open several avenues of future research. Studies might directly explore the strategies used by new ventures when entering regulated markets in which multiple governmental actors influence entry (Conti and Valentini, 2017; Ozcan and Gurses, 2018). Although recent studies have examined the unconventional ways by which entrepreneurs can enter regulated markets (Hiatt and Park, 2013), researchers have yet to theoretically or empirically explore the different strategies used by new ventures and incumbent firms to influence their regulatory environments, or the strategies' relative effectiveness with the various institutional actors who control entry. For instance, are resource-rich entrants just as effective as incumbent firms at lobbying elected officials and regulatory agencies? Would it be better for entrants to engage regulatory agencies with framing and collective action strategies simultaneously, or would it be better for them to avoid regulatory approval as long as possible and focus on other market-building activities?

In addition, future research might examine the tactics that entrepreneurs seeking regulatory approval can use to leverage the tensions between institutional actors. In a study on the pay TV market, Gurses and Ozcan (2015) found that entrepreneurs seeking to enter the market framed their ventures' products and services as improving consumer welfare and enhancing egalitarian distribution. Given that regulatory agencies' public service motivation places high value on creating distributional justice and fairness, the strategic framing of organizational activities as solutions to these issues could be a fruitful strategy and merits additional research (Lounsbury, Ventresca, and Hirsch, 2003). In a similar vein, what role do endorsements and resources from important stakeholders, such as a local chamber of commerce or social movements, play in signaling to agency officials that a firm's operations can enhance the local public welfare? Likewise, scholars may wish to explore the degree to which entrepreneurs' affiliation with local institutional actors such as senior figures in the media and prominent government figures can affect regulatory outcomes (Hiatt, Carlos, and Sine, 2018).

Another question this study raises is how an entrepreneur's attributes may interact with regulatory agency discretion to facilitate market entry. Prior studies showed that entrepreneurs who were formerly employed at firms using the new venture's products as inputs have better knowledge and experience in navigating regulatory hurdles and are more likely to recognize opportunities in regulated markets, compared with entrepreneurs lacking such experience (Adams, Fontana, and Malerba, 2017). Other research has suggested that an entrepreneur's ability to recognize and exploit weak regulatory enforcement may lead to more successful entry into a regulated market, particularly when institutional actors lack incentives or expertise to adequately monitor or enforce regulations (Webb et al., 2009). Future research on entrepreneurs' prior experiences and capabilities is warranted.

How regulatory discretion affects the ability of external stakeholders, such as social activists, to support or constrain organizational activities may also be an important area for future research. Although studies have linked stakeholder activism to entrepreneurial activity (Hiatt, Sine, and Tolbert, 2009; Sine and Lee, 2009; York, Hargrave, and Pacheco, 2016; Hiatt and Carlos, 2019), much of this research has taken a relatively static view of political opportunity structures that enable activists' influence. Regulatory discretion may allow activists to shape the institutional environment by questioning regulatory agencies' legitimacy and reputation, making political opportunity structures more dynamic features of the institutional environment (Carpenter, 2002). Thus the variation in regulatory discretion across states may both trigger and shape external stakeholders' ability to affect organizational outcomes.

Finally, we believe that this study has practical implications for entrepreneurs and policymakers. It informs entrepreneurs of how they might better navigate regulatory agency interactions and achieve positive outcomes. Entrepreneurial firms often face unique challenges in confronting their regulatory environment due to lack of resources, legitimacy, and the political connections that large, established firms may enjoy. Understanding how different characteristics of the regulatory environment help entrepreneurs overcome these limitations is valuable for entrepreneurs seeking to launch new ventures in regulated markets. New ventures in states with high regulatory discretion received approval decisions approximately 351 days sooner than average. This is consequential, as it can cost a new hydroelectric power venture up to \$7,740 in foregone revenue for each day it awaits license approval.

Our results can also enlighten policymakers about how to structure state governance to achieve desired policy outcomes. Promoting innovation, entrepreneurship, and environmentally sustainable business practices is high on many state and federal policy agendas (Reinhardt, 2000; Bansal and Hoffman, 2012; Kim and Lyon, 2015; Hoffman and Jennings, 2018). Although public policies have been designed to lower barriers to entry and provide resources that make entry more viable (Armanios et al., 2017; Eberhart, Eesley, and Eisenhardt, 2017), empirical studies have found mixed results for such reforms. Some studies showed that lowering entry barriers leads to entrepreneurship, such as when the U.S. government passed laws allowing independent energy firms to sell power to the electric grid (Sine, Haveman and Tolbert, 2005), whereas others suggested that market entry does not significantly increase following regulatory reforms (Klapper and Love, 2010). The discretion granted to regulators may have positively or negatively affected the ability of such policies to achieve their stated goals. Consequently, our findings highlight the concerns of legal and policy scholars who advise that policy creation should not be divorced from policy implementation (Pressman and Wildavsky, 1984; Rawhouser, Cummings, and Hiatt, 2019). When seeking to foster entrepreneurship, innovation, and economic and environmental sustainability, policymakers should consider the institutional design of regulatory agencies and their degree of discretion over policy implementation.

This study speaks to the century-old legal and public policy debate about the amount of discretion and authority the administrative state should have in modern democracies. Some scholars have argued that an autonomous administrative state enhances social welfare because civil service can recruit trained experts who implement policies more efficiently and equitably than political

appointees (Weber, 1968). Others have argued that bureaucratic discretion threatens democracy by eroding citizens' ability to direct government policy through representative government and permitting an unrestrained abuse of power (Mill, 1958; Niskanen, 1971; Matsusaka, 2020). As elected officials alter bureaucratic discretion in the attempt to achieve the optimum balance, future research may examine how these adjustments change the political and competitive strategies of incumbent firms and new ventures.

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Supplemental Material

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Authors' Biographies

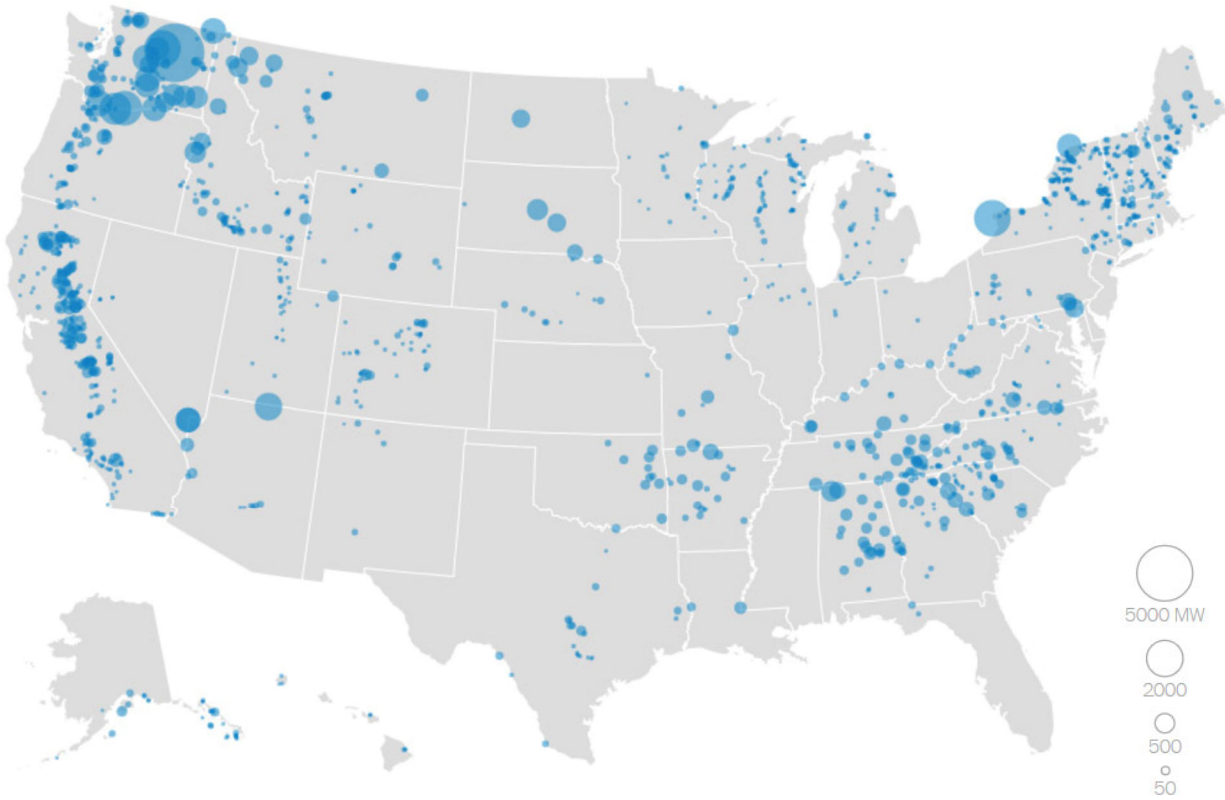
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ONLINE APPENDIX

Appendix A: U.S. Hydroelectric Facilities, New Facility Applications, and Regulatory Agencies

Figure A1. Hydroelectric facility locations in the United States in 2016.*



* Source: Washington Post, <https://www.washingtonpost.com/graphics/national/power-plants/>.

Figure A2. Examples of hydroelectric facility license application process.*

PROJECT TYPE ^a				
Application Element	Major Unconstructed or Major Modified (>5 MW)	Major Project-Existing Dam (>5 MW)	Minor Water Power Project (#1.5 MW), or Major Power Project Existing Dam (#5 MW)	Major Unconstructed or Major Modified (>1.5 MW but < 5 MW)
General Information	4.32(a)	4.32(a)	4.32(a)	4.32(a)
Initial Statement	4.41(a)	4.51(a)	4.61(b)	4.61(b)
Exhibit A	Project Description 4.41(b)	Project Description 4.51(b)	Project Description and Proposed Operating Mode 4.61(c)	Project Description and Proposed Operating Mode 4.61(c)
Exhibit B	Project Operation and Resource Utilization 4.41(c)	Project Operation and Resource Utilization 4.51(d)	Not Required	Not Required
Exhibit C	Proposed Construction Schedule 4.41(d)	Construction History and Proposed Construction 4.51(d)	Not Required	Not Required
Exhibit D	Statement of Costs and Financing 4.41(e)	Statement of Costs and Financing 4.51(e)	Not Required	Not Required
Application Element	Major Unconstructed or Major Modified (>5 MW)	Major Project-Existing Dam (>5 MW)	Minor Water Power Project (#1.5 MW), or Major Power Project Existing Dam (#5 MW)	Major Unconstructed or Major Modified (>1.5 MW but < 5 MW)
Exhibit E (See Appendix D for Guidelines for Preparing Exhibit E)	Environmental Report 5.18(b), 4.41(f), 4.38(f) or draft environmental document 4.34(i)	Environmental Report 5.18(b), 4.51(f) and 4.38(f) or 16.8(f), or draft environmental document 4.34(i)	Environmental Report 5.18(b), 4.61(d) and 4.38(f) or 16.8(f) or draft environmental document 4.34(i)	Environmental Report 5.18(b), 4.41(f), 4.38(f) or draft environmental document 4.34(i)
Exhibit F	Design Drawings and Supporting Design Report 4.41(g)	Design Drawings and Supporting Design Report 4.51(g)	General Drawings 4.61(e)	General Drawings 4.61(e)
Exhibit G	Maps of Location, Boundary, Federal Lands, and Nonfederal Land Ownership must be GIS based 4.41(h)	Maps of Location, Boundary, Federal Lands, and Nonfederal Land Ownership must be GIS based 4.51(h)	Boundary and Project Map must be GIS based 4.61(f)	Boundary and Project Map must be GIS based 4.61(f)
Exhibit H	N/A	Plans and Ability of Applicant to Operate Project Efficiently for relicense 16.10	Plans and Ability of Applicant to Operate Project Efficiently for relicense 16.10	Plans and Ability of Applicant to Operate Project Efficiently for relicense 16.10

* Source: Federal Energy Regulatory Commission, https://www.ferc.gov/industries/hydropower/gen-info/handbooks/licensing_handbook.pdf.

Figure A3. Number of hydroelectric regulatory agencies by state (as of 2014).

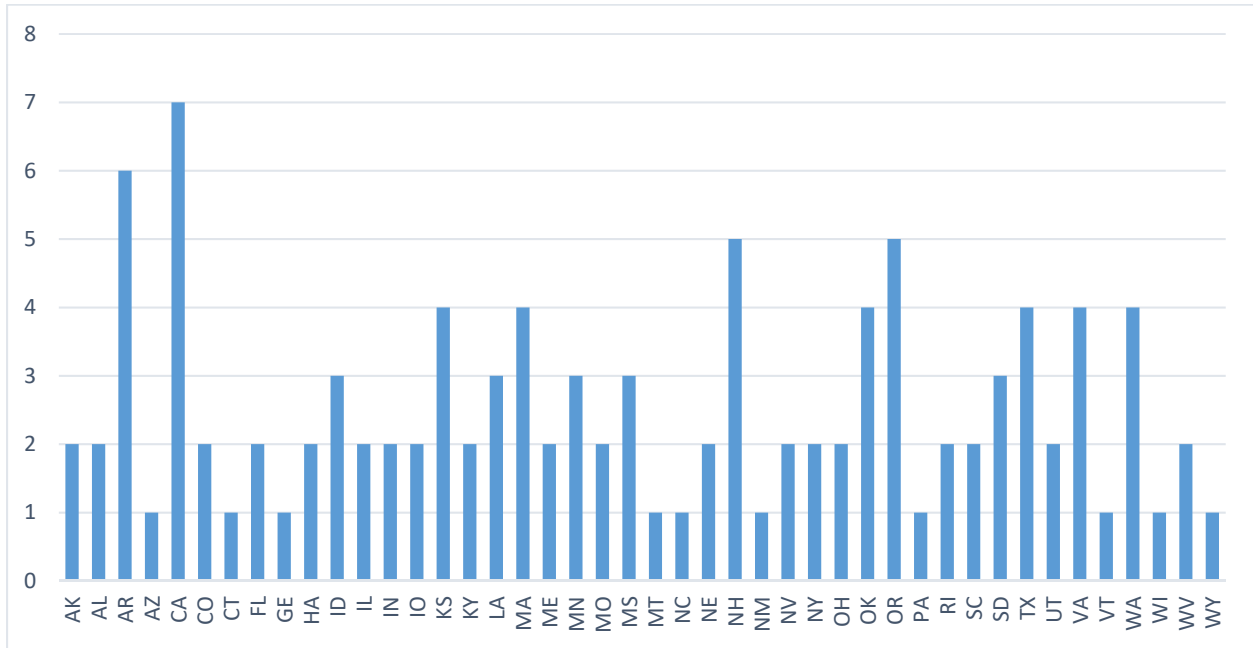
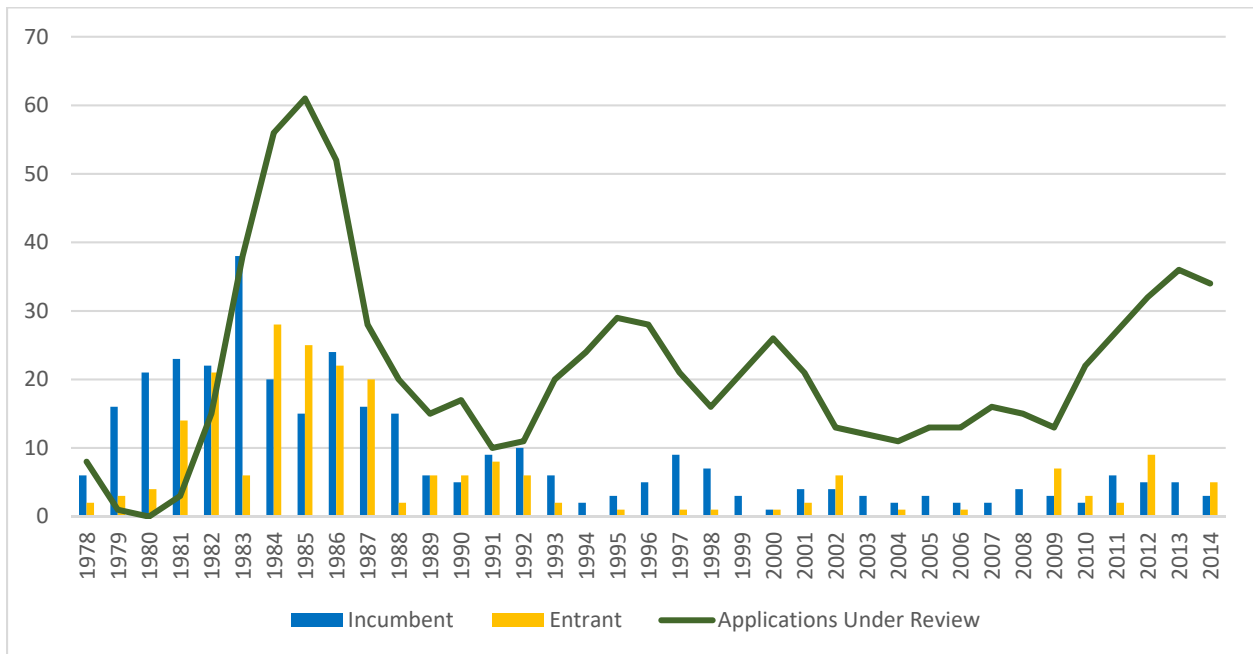


Figure A4. New hydroelectric facility license applications in all states by year.



Appendix B: Regulatory Discretion Measure

In the political science literature, discretion is defined as the formally granted flexibility, often through statutes and laws, of regulatory agency officials to interpret and implement public policies created by elected officials. For example, Ringquist (1995: 331) defined it as “making judgements regarding policy actions not prescribed in detail by formal rules or legislation,” and Potoski and Woods (2001: 206) wrote that “agency discretion refers to the degree of influence an agency holds over a policy, so that an agency with greater policy influence enjoys greater autonomy.” Often, discretion results in the implementation of policies in ways that differ from the preferences of the legislature, as noted by Calvert, McCubbins, and Weingast (1989: 605), who refer to discretion as agency goals that “differ from what the executive and legislature expected.”

As a somewhat abstract variable, regulatory discretion is difficult to operationalize. Most studies of regulatory discretion in the political science literature are theoretical in nature or rely on formal modeling to develop insights into how discretion affects regulatory outcomes (McCubbins and Schwartz, 1984; Calvert, McCubbins, and Weingast, 1989; Gailmard, 2002). Despite this difficulty, some empirical studies have developed measures for empirical analysis. In their seminal work on discretion, Huber and Shipan (2002) measured discretion as the number of words in legislation adopted in a one-year period with the assumption that more words mean that the legislation is more specific and thereby leaves less room for regulatory agency interpretation and discretion. Other empirical studies have relied on participant observation (MacDonald and Franko, 2007) or surveys (Hanretty and Koop, 2009) to develop measures of regulatory discretion. Although innovative, few of these measures lend themselves well to multi-state, longitudinal studies in which discretion may affect multiple different pieces of legislation and multiple different agencies.

Our measure for regulatory discretion draws on a construct developed in the law and political science literature by Hecht (2004). Hecht’s discretion construct has been used in research conducted by the Environmental Law Institute (2013) and has been referenced as a measure of discretion for implementing environmental laws in the law and political science literature (e.g., Wagner, 2005; Andreen, 2012; Owen, 2017).

The measure examines obstacles or limitations that states place on their regulatory agencies that inhibit their rulemaking ability relevant to all forms of state and federal environmental laws (and not strictly those that affect hydropower licensing). The discretion measure is a weighted index developed from 13 different attributes of private property rights acts (PPRAs) that apply to regulatory agencies. PPRAs can be considered a form of administrative procedures acts: legal mechanisms that limit the scope of regulatory decision making. PPRAs require state regulatory agencies to evaluate whether their actions limit an owner’s lawful use of private property (that is, constitute a regulatory “taking”) and to implement safeguards to prevent this from happening

when implementing regulations. In essence, they attempt to balance the necessity of legitimate regulation with the possibility of excessive government interference in an owner’s ability to use their private property.

PPRAs targeting agency decisions that require legislative approval were excluded from the index. The scale ranges from 0 to 100; a high score indicates that the regulatory agency has little discretion in preventing property owners from using their property however they see fit, and a low score indicates a great deal of flexibility in making regulatory decisions.

Although not explicitly created as a measure of discretion, this variable captures the essence of how administrative procedures acts constrain regulatory agency discretion. When they are sufficiently restrictive of agencies’ decision making, regulators have little discretion and must implement policies consistent with what the formal laws created by the legislature mandate. Conversely, administrative procedures acts that are not restrictive (or are absent) allow agencies greater flexibility in interpreting and implementing laws, thereby creating the opportunity for regulators’ incentives and motivations to be enacted in lieu of those of legislators. In the hydroelectric power sector, for instance, a higher PPRA score would limit a state agency from taking into account any factor beyond existing environmental policies and legislative intent when approving project licenses.

In the table below, we summarize each attribute and its weight in the index.

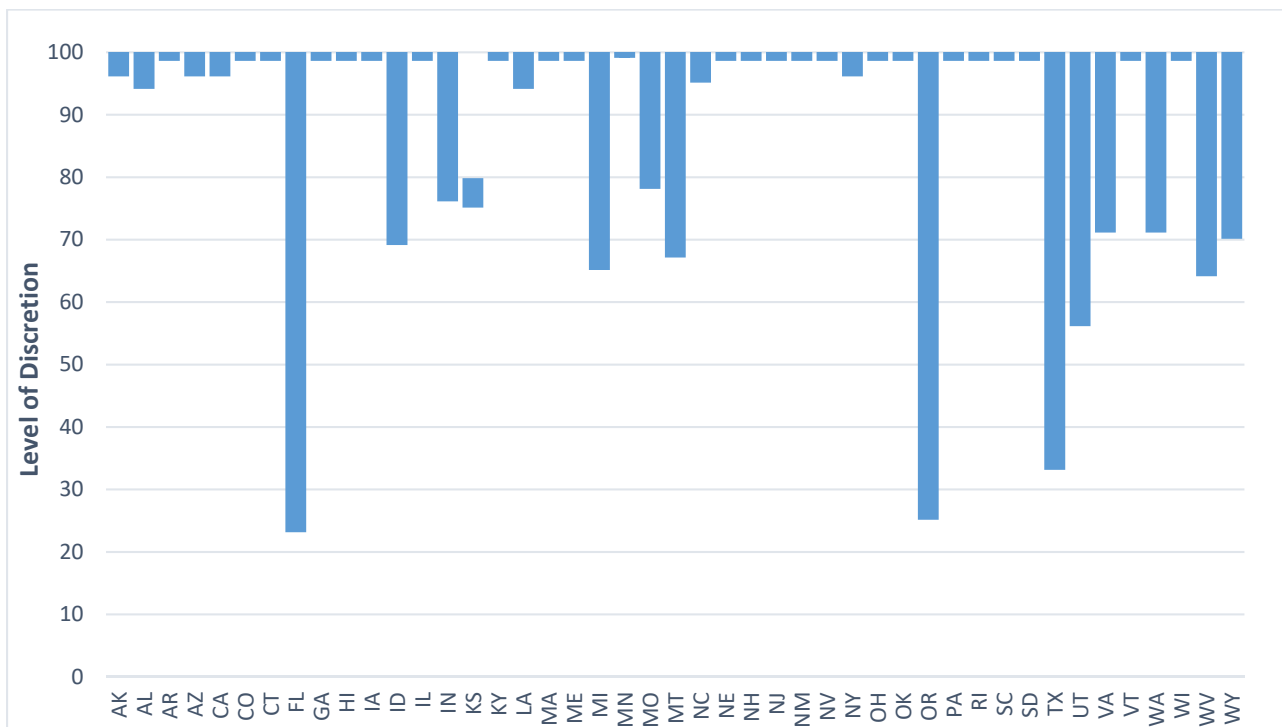
Table B1. Attributes Used in Weighted Index Measure of Regulatory Discretion

Provision	Justification	Weight
Assessment	Act requires government to perform a takings assessment prior to any action. Assessment requirements tend to discourage regulatory agency actions.	10
Compensation	Act expands property rights and requires compensation for any diminution in value due to state regulations. This creates compensation requirements at the state level that don’t exist at the federal level.	30
Affects executive bodies	Act applies to state regulatory agencies. This is essentially an identity test; acts that apply only to the legislature are not included.	5
Affects local governments	Act also applies to legislative actions of local governments. This restricts regulatory agency actions because it discourages local level regulations that expand the scope of regulatory agency actions.	6
Affects state legislature	Act is also binding on the state legislature. This significantly limits and discourages regulatory agency	10

	actions because the state legislature cannot create exemptions.	
Applies to exactions	An exaction is a demand by a regulatory agency that mandates a property owner to surrender certain property rights in exchange for a license, permit, or other benefit. PPRAs that apply to exactions allow property owners to challenge regulatory actions up front, which discourages regulatory actions.	8
Applies to final rules	Act allows challenges to final agency rules, regardless of whether they've been applied. This discourages agencies from promulgating far-reaching regulatory actions for fear they will be struck down before they've even been applied.	5
Applies to proposed rules	Act allows challenges to proposed rules that have not yet gone into effect. This is a more aggressive way of discouraging regulatory agency action than allowing challenges to final rules. (Note: "applies to final rules" and "applies to proposed rules" are not mutually exclusive.)	6
Outside review	Act requires either a full or partial review of regulatory agency action by a reviewer outside the agency (usually the attorney general). This exposes the regulatory process to politicization and discourages regulatory action.	7
No emergency exceptions	Act does not allow for emergency regulation that may interfere with private property rights.	3
Fee-shifting	Successful challenges to regulatory agency actions require the agency to pay the challenger's attorneys' fees. This incentivizes challenges to regulation and discourages regulatory actions.	12
Paid repeals	Regulatory agency must pay the costs of a challenge even when it repeals the action prior to a final takings determination. This similarly incentivizes challenges and discourages regulatory actions.	8
Limited applicability	Act applies to only a select set of private property rights. This is essentially a multiplier that reduces the value of the index for private property rights acts that apply in only limited circumstances.	0.1x

Using this index, Hecht evaluated 20 specific PPRAs for the presence or absence of each item and scored each state accordingly, creating a cross-sectional picture of discretion for all 50 states. To mitigate the influence of interpretive bias, Hecht conducted an iterative sensitivity analysis to ensure that the distribution of discretion scores across states didn't change significantly with small changes in the attribute weights. For our analyses, we used this index and state-level PPRAs to create a panel of discretion scores for each state and year. Within any given state, different PPRAs were adopted at different times, so we obtained an index of discretion that varied over time and by state.

Figure B1. Minimum and maximum discretion by state, 1978–2014.



Appendix C: Results Tables

Table C1. Descriptive Statistics and Bivariate Correlations

Variable	Mean	S.D.	1	2	3	4	5	6	7	8	9	10	11	12	13
1. Entrant	.036	.187													
2. Discretion	-.248	1.237	.111												
3. Political comp (upper)	.736	.442	.049	.025											
4. Political comp (lower)	.224	.418	-.098	-.181	-.186										
5. Political comp (executive)	.284	.452	.094	-.015	.048	.098									
6. Divided control	.816	.388	-.065	-.127	-.118	.189	.022								
7. Public firm	.444	.498	-.391	.131	.021	-.025	-.014	.039							
8. Coop firm	.056	.230	-.154	-.012	-.032	-.037	-.056	.004	-.082						
9. Facility size	2206.883	3778.307	-.023	-.001	.056	.002	-.053	-.073	.003	-.016					
10. Firm size	5347.714	8209.409	-.066	.035	-.024	.005	-.047	-.011	.189	.138	.042				
11. Firm age	50.472	32.917	-.673	.010	.011	.005	-.133	.040	.381	.088	.136	.083			
12. Experience	.728	.446	-.377	-.113	.038	.113	.049	.159	.370	-.123	.005	-.031	.284		
13. Population	15.276	1.377	-.011	.013	.303	-.113	.148	-.101	.083	-.107	.06	.062	.092	.113	
14. Gross state product	33.307	10.012	-.106	-.337	-.154	-.015	.035	.072	-.050	.098	.006	-.044	.036	.017	.079
15. Freq. of enforcement	34.640	72.014	.083	.137	.139	-.114	.138	.074	.118	-.085	.021	.085	-.023	.050	.520
16. State laws	2.400	1.828	.049	.024	.255	-.237	.165	-.043	.158	-.104	.025	-.034	.046	.102	.680
17. Number of agencies	1.700	.884	.144	-.019	.164	-.138	.132	-.457	-.037	.010	.039	.004	-.117	-.115	.355
18. Unemployment rate	6.882	1.935	.070	.056	.046	-.022	.039	-.022	-.082	-.009	.099	.043	-.088	-.053	-.001
19. Energy incentives	.820	1.637	-.102	-.445	-.142	.094	.021	-.065	-.024	-.017	.01	.025	.032	.084	-.089
20. Herfindahl index	.475	.431	.100	-.052	-.092	-.123	-.078	-.177	-.140	.080	.083	-.122	.213	-.437	-.175
21. Comm. energy price	7.812	1.012	-.042	-.424	-.120	.086	.051	.073	-.119	.018	-.007	-.065	-.018	.010	-.012
22. Apps. under review	15.404	12.184	.048	.304	.127	.037	.148	.033	.089	-.091	.015	.017	-.071	.067	.083
23. Executive party	.056	.230	.087	-.222	-.082	.015	.061	-.131	-.154	-.055	-.038	-.072	-.083	-.068	.036
24. Lower-chamber party	.078	.206	-.099	.215	.135	-.067	.008	-.519	.133	-.004	.027	.084	.125	.143	.443
25. Upper-chamber party	-.059	.228	.004	.171	.037	-.035	-.043	-.793	.000	.036	.025	.063	-.007	-.07	.091
26. LCV	60.284	26.797	-.072	.034	-.003	.127	.123	-.206	.071	-.126	.027	-.038	.097	.135	.179
27. U.S. president	.552	.498	-.152	-.241	-.083	.107	-.051	.103	-.033	.018	.017	-.078	.088	.057	-.04
28. ECPA	1.000	.000	-.078	-.270	-.150	.095	.030	.108	-.007	-.044	-.067	-.037	.023	.093	.036
29. Stakeholder objections	.232	.532	.022	-.102	-.042	.085	-.02	.012	-.07	-.021	.013	.034	-.076	.035	.007
30. Incumbent objections	.252	.644	-.030	-.003	.002	.007	-.024	.103	-.047	-.066	.063	.129	.030	.020	.032
31. Other objections	.792	.814	-.010	-.011	-.001	-.011	-.003	.029	.145	-.013	-.018	.050	.009	.158	.020
32. Lawsuits	.032	.357	-.008	-.026	-.023	-.046	-.011	.050	.018	.065	-.069	.001	.005	-.024	-.009

Table C1. Descriptive Statistics and Bivariate Correlations (continued)

Variable	14	15	16	17	18	19	20	21	22	23	24	25	26	27
15. Freq. of enforcement	.110													
16. State laws	-.044	.413												
17. Number of agencies	-.054	.121	.573											
18. Unemployment rate	-.039	.004	.006	-.017										
19. Energy incentives	.429	-.089	-.052	.071	-.047									
20. Herfindahl index	.211	-.168	-.294	.065	-.028	.162								
21. Comm. energy price	.839	.004	-.134	-.099	-.012	.464	.183							
22. Apps. under review	-.433	-.056	.160	.030	-.012	-.348	-.275	-.432						
23. Executive party	.526	.129	-.127	-.001	.052	.281	.054	.544	-.491					
24. Lower chamber party	-.102	.230	.251	.114	.041	-.044	-.170	-.200	.032	.054				
25. Upper chamber party	-.123	-.075	-.055	.268	.028	.083	.096	-.103	-.029	.088	.707			
26. LCV	-.056	.03	.118	.012	-.001	.160	-.094	-.025	-.012	.081	.436	.322		
27. U.S. president	.484	-.018	-.189	-.158	.019	.138	.042	.457	-.468	.419	-.092	-.114	-.067	
28. ECPA	.652	-.023	-.078	-.116	-.101	.233	.000	.683	-.042	.258	-.143	-.131	-.114	.294
29. Stakeholder objections	.039	-.030	-.042	.012	-.023	.054	-.059	.042	.099	.014	-.058	-.002	-.027	-.014
30. Incumbent objections	.038	.009	.015	-.055	.047	-.04	-.118	.003	.122	-.065	-.056	-.110	-.047	.006
31. Other objections	.128	.015	.082	-.017	-.024	.021	-.153	.119	.135	.016	.052	.004	.027	.018
32. Lawsuits	-.009	-.006	.033	.012	-.022	-.019	.075	.026	-.008	-.037	-.093	-.086	-.072	.001

Variable	28	29	30	31
29. Stakeholder objections	.135			
30. Incumbent objections	.090	.091		
31. Other objections	.227	.132	.187	
32. Lawsuits	-.036	-.012	-.030	.030

Table C2. Accelerated Failure Time Models (Weibull, N = 1,266)*

Variables	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6	Model 7	Model 8	Model 9	Model 10	Model 11	Model 12
New entrant		-.096 (.111)		-.122 (.100)	-.178 (.153)	-.214 (.154)	.000 (.189)	-.031 (.190)	-.233 (.183)	-.232 (.184)	-.144 (.135)	-.188 (.127)
Discretion			.027 (.049)	.143** (.041)	.215* (.090)	.308** (.094)	.124 (.079)	.276** (.107)	.268** (.087)	.268** (.089)	.169+ (.099)	.063 (.097)
New entrant × Discretion				-.254** (.043)	-.364** (.130)	-.618** (.144)	-.321** (.071)	-.622** (.146)	-.386** (.135)	-.387* (.152)	-.359** (.075)	-.149* (.065)
Pol. comp (upper)					.051 (.112)	.013 (.114)						
Pol. comp. (upper) × New entrant					-.010 (.155)	-.039 (.147)						
Pol. comp. (upper) × Discretion					-.108 (.085)	-.219* (.086)						
Pol. comp. (upper) × New entrant × Discretion						.454** (.175)						
Pol. comp (lower)							-.159 (.133)	-.194 (.135)				
Pol. comp. (lower) × New entrant							.036 (.176)	.032 (.175)				
Pol. comp. (lower) × Discretion							.074 (.081)	-.124 (.126)				
Pol. comp. (lower) × New entrant × Discretion								.409* (.176)				
Pol. comp. (exec)									-.107 (.193)	-.107 (.194)		
Pol. comp (exec) × New entrant									.270 (.249)	.270 (.254)		
Pol. comp (exec) × Discretion									-.246 (.165)	-.247 (.240)		
Pol. comp (exec) × New entrant × Discretion										.002 (.325)		

Table C2. Accelerated Failure Time Models (continued)

Variables	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6	Model 7	Model 8	Model 9	Model 10	Model 11	Model 12
Divided party											-.199	-.216
											(.136)	(.137)
Divided party × New entrant											-.094	-.047
											(.138)	(.127)
Divided party × Discretion											-.020	.106
											(.085)	(.083)
Divided party × New entrant × Discretion												-.311**
												(.090)
Public firm	.190	.168	.183	.127	.100	.088	.125	.105	.072	.072	.144	.139
	(.143)	(.142)	(.144)	(.133)	(.147)	(.147)	(.150)	(.150)	(.181)	(.181)	(.128)	(.127)
Coop firm	-.473*	-.495**	-.469*	-.520**	-.498**	-.534**	-.337+	-.356*	-.359	-.359	-.483*	-.482*
	(.195)	(.189)	(.193)	(.174)	(.190)	(.186)	(.187)	(.180)	(.341)	(.341)	(.195)	(.196)
Facility size	-.000	-.000	.000	-.000	-.000+	-.000	-.000**	-.000**	-.000	-.000	-.000	-.000
	(.000)	(.000)	(.000)	(.000)	(.000)	(.000)	(.000)	(.000)	(.000)	(.000)	(.000)	(.000)
Firm size	.000**	.000**	.000**	.000**	.000**	.000**	.000*	.000*	.000	.000	.000**	.000**
	(.000)	(.000)	(.000)	(.000)	(.000)	(.000)	(.000)	(.000)	(.000)	(.000)	(.000)	(.000)
Firm age	.005**	.004*	.005**	.004*	.003	.002	.004*	.004+	.003	.003	.003+	.003+
	(.002)	(.002)	(.002)	(.002)	(.002)	(.002)	(.002)	(.002)	(.002)	(.002)	(.002)	(.002)
Regulatory experience	.051	.048	.0573	.033	.022	.020	-.053	-.032	-.084	-.084	-.248**	-.244**
	(.109)	(.109)	(.108)	(.109)	(.090)	(.089)	(.101)	(.102)	(.135)	(.135)	(.070)	(.068)
Population	.098	.098	.104	.141+	.107+	.100+	.194**	.175*	.202*	.202*	.144*	.148*
	(.064)	(.063)	(.073)	(.074)	(.058)	(.057)	(.069)	(.069)	(.087)	(.088)	(.073)	(.072)
Gross state product	.011*	.011*	.0108*	.014**	.009	.009+	.015*	.015*	.013	.013	.018**	.019**
	(.005)	(.005)	(.005)	(.005)	(.005)	(.005)	(.006)	(.006)	(.010)	(.010)	(.005)	(.005)
Freq. of enforcement	-.001+	-.001+	-.001+	-.001*	-.001*	-.001*	-.001+	-.001+	-.001	-.001	-.001**	-.001**
	(.000)	(.000)	(.000)	(.000)	(.000)	(.000)	(.001)	(.001)	(.001)	(.001)	(.000)	(.000)
Local enforcement	-.342**	-.339**	-.353**	-.428**	-.306*	-.303*	-.407**	-.381*	-.417*	-.417*	-.524**	-.537**
	(.103)	(.105)	(.117)	(.131)	(.149)	(.148)	(.151)	(.152)	(.199)	(.200)	(.133)	(.129)
State laws	.046	.047	.045	.053	.052	.054	.051	.054	.051	.051	.078+	.081*
	(.037)	(.037)	(.037)	(.039)	(.038)	(.038)	(.041)	(.041)	(.057)	(.057)	(.040)	(.039)
Number of agencies	.001	.001	.003	-.013	-.010	-.006	-.031	-.027	-.026	-.026	-.032	-.038
	(.034)	(.034)	(.034)	(.035)	(.041)	(.041)	(.046)	(.045)	(.059)	(.059)	(.036)	(.035)
Unemployment rate	-.067**	-.067**	-.069**	-.078**	-.080**	-.081**	-.055*	-.051*	-.052	-.052	-.076**	-.080**
	(.025)	(.024)	(.024)	(.023)	(.021)	(.021)	(.025)	(.025)	(.036)	(.036)	(.025)	(.025)
Energy incentives	.073	.072	.081	.038	.055	.051	.044	.053	.059	.059	.059	.043
	(.050)	(.049)	(.056)	(.051)	(.045)	(.043)	(.053)	(.051)	(.063)	(.063)	(.062)	(.057)
Herfindahl index	.092	.104	.098	.128	-.050**	-.050**	-.066**	-.067**	-.070*	-.070*	-.054**	-.056**
	(.259)	(.262)	(.258)	(.238)	(.012)	(.012)	(.014)	(.014)	(.028)	(.028)	(.006)	(.006)

Table C2. Accelerated Failure Time Models (continued)

Variables	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6	Model 7	Model 8	Model 9	Model 10	Model 11	Model 12
Comm. energy price	-.057 (.069)	-.055 (.069)	-.049 (.066)	-.069 (.071)	.000 (.019)	.004 (.018)	-.004 (.019)	.003 (.019)	-.006 (.029)	-.006 (.030)	-.120 (.077)	-.114 (.078)
Apps. under review	.002** (.001)	.002** (.001)	.002** (.001)	.002** (.001)	.006 (.005)	.005 (.005)	.003** (.001)	.003** (.001)	.004** (.001)	.004** (.001)	.002** (.001)	.002** (.001)
Executive party	-.075 (.275)	-.064 (.274)	-.053 (.274)	-.097 (.255)	-.202 (.220)	-.125 (.233)	.068 (.258)	.168 (.277)	.225 (.332)	.225 (.332)	.013 (.262)	-.047 (.245)
Lower chamber party	.183 (.245)	.173 (.243)	.193 (.245)	.120 (.247)	.103 (.229)	.094 (.228)	.019 (.252)	-.013 (.248)	-.116 (.411)	-.116 (.411)	.013 (.211)	-.017 (.212)
Upper chamber party	-.117 (.221)	-.114 (.218)	-.144 (.235)	-.111 (.223)	-.096 (.212)	-.105 (.210)	-.054 (.243)	-.022 (.237)	-.128 (.378)	-.128 (.378)	-.404 (.258)	-.379 (.262)
LCV score	.001 (.002)	.001 (.002)	.001 (.002)	.001 (.002)	.001 (.002)	.001 (.002)	.001 (.003)	.001 (.003)	-.004 (.004)	-.004 (.004)	.002 (.002)	.002 (.002)
U.S. president	.392** (.099)	.379** (.096)	.395** (.101)	.370** (.088)	.296** (.092)	.296** (.091)	.457** (.121)	.452** (.121)	.494** (.163)	.494** (.163)	.377** (.086)	.363** (.087)
ECPA	.162 (.115)	.161 (.116)	.160 (.113)	.154 (.117)	.162 (.101)	.144 (.102)	-.075 (.113)	-.083 (.113)	-.057 (.164)	-.057 (.164)	.146 (.124)	.132 (.124)
Stakeholder objections	-.003 (.088)	-.011 (.090)	.003 (.094)	-.005 (.092)	.011 (.083)	-.003 (.081)	.027 (.093)	.016 (.092)	.013 (.142)	.013 (.142)	-.033 (.092)	-.028 (.093)
Incumbent objections	-.010 (.031)	-.013 (.031)	-.008 (.030)	-.001 (.026)	.003 (.061)	.002 (.059)	.046 (.067)	.045 (.065)	.040 (.122)	.040 (.122)	.017 (.029)	.018 (.028)
Other objections	.269** (.058)	.272** (.057)	.268** (.057)	.281** (.057)	.265** (.070)	.277** (.071)	.326** (.072)	.327** (.073)	.349** (.103)	.349** (.103)	.276** (.065)	.272** (.066)
Lawsuits	.044** (.015)	.042** (.015)	.044** (.015)	.038** (.015)	.035+ (.018)	.036* (.018)	.058 (.037)	.058 (.036)	.059 (.072)	.059 (.072)	.028* (.013)	.026* (.013)
Tax burden	.232 (.298)	.248 (.289)	.218 (.308)	.251 (.300)	.111 (.311)	.248 (.315)	.209 (.346)	.315 (.347)	.031 (.536)	.030 (.539)	.513+ (.282)	.536+ (.280)
Type: dam	-.133+ (.070)	-.139+ (.071)	-.131+ (.071)	-.135+ (.074)	-.124 (.083)	-.127 (.082)	-.129 (.082)	-.123 (.082)	-.128 (.117)	-.128 (.117)	-.127+ (.077)	-.119 (.078)
Type: pumped storage	-.322 (.431)	-.374 (.448)	-.348 (.424)	-.433 (.416)	-.491 (.311)	-.574+ (.303)	-.390 (.302)	-.483+ (.292)	-.554 (.490)	-.553 (.490)	-.548 (.420)	-.515 (.430)
Type: tidal	-1.288* (.641)	-1.272* (.623)	-1.282* (.632)	-1.438* (.605)	-1.814** (.692)	-2.444** (.678)	-2.150** (.729)	-2.746** (.852)	-2.993** (.784)	-2.991** (.813)	-2.111** (.720)	-2.246** (.686)
Wald chi-squared	2994.48**	3070.02**	3275.62**	9066.64**	309.07**	337.62**	250.72**	280.45**	105.91**	105.91**	325756.85**	228513.65**

+ $p < .10$; * $p < .05$; ** $p < .01$.

* Accelerated failure time coefficients are interpreted as accelerating (-) or decelerating (+) time to failure (facility licensing). Constant terms are not reported. Robust standard errors are in parentheses.

Appendix D: Text Analysis of Regulatory Agencies' Annual Reports

To further support our assertion that state agencies have a culture or ethos biased toward societal good, fairness, local communities, and innovativeness, we collected mission statements and annual reports from all agencies in our data set and ran text analysis using Linguistic Inquiry and Word Count software. Following the methodology in prior studies (Helms, Oliver, and Webb, 2012; Hiatt and Carlos, 2019), we examined articles to identify unique word categories that were distinct to each type of logic or ethos. We then created a custom dictionary of keywords that denoted support for an ethos or logic of public service and support for an ethos or logic of adherence to legislative mandates or corporate influence (legislative adherence). Next, we developed finer-grained grouping of the words by going back to the articles and comparing the meanings of sentences containing a variety of keywords.

We compared these two outputs to each other for each agency. The results as illustrated in the figures below suggest that keywords indicating a preference toward a public service logic appear on average five times more often than keywords that demonstrate a preference toward adhering to legislative mandates.

In creating these search terms, we were cognizant that government agencies do not explicitly state that they prefer one type of economic actor over another, as these actions might have negative consequences for the agency. For example, elected officials might object and be motivated to act if such a preference were made public, and clients of the agency who did not receive the benefits of such a preference might file lawsuits or lobby elected officials to make changes. Sociological and public administration studies find that this type of agency preference toward serving more underserved clients is publicly discussed in nuanced ways, which we tried to capture in our analysis.

Custom Dictionary for Public Service versus Legislative Adherence Ethos:

Public Service Ethos	Legislative Adherence Ethos
local	corporat*
communit*	governor
equit*	executive
fair*	legislat*
justice	law*
innovat*	legislat*

Figure D1. Ratio of public service / legislative adherence ethos keywords.

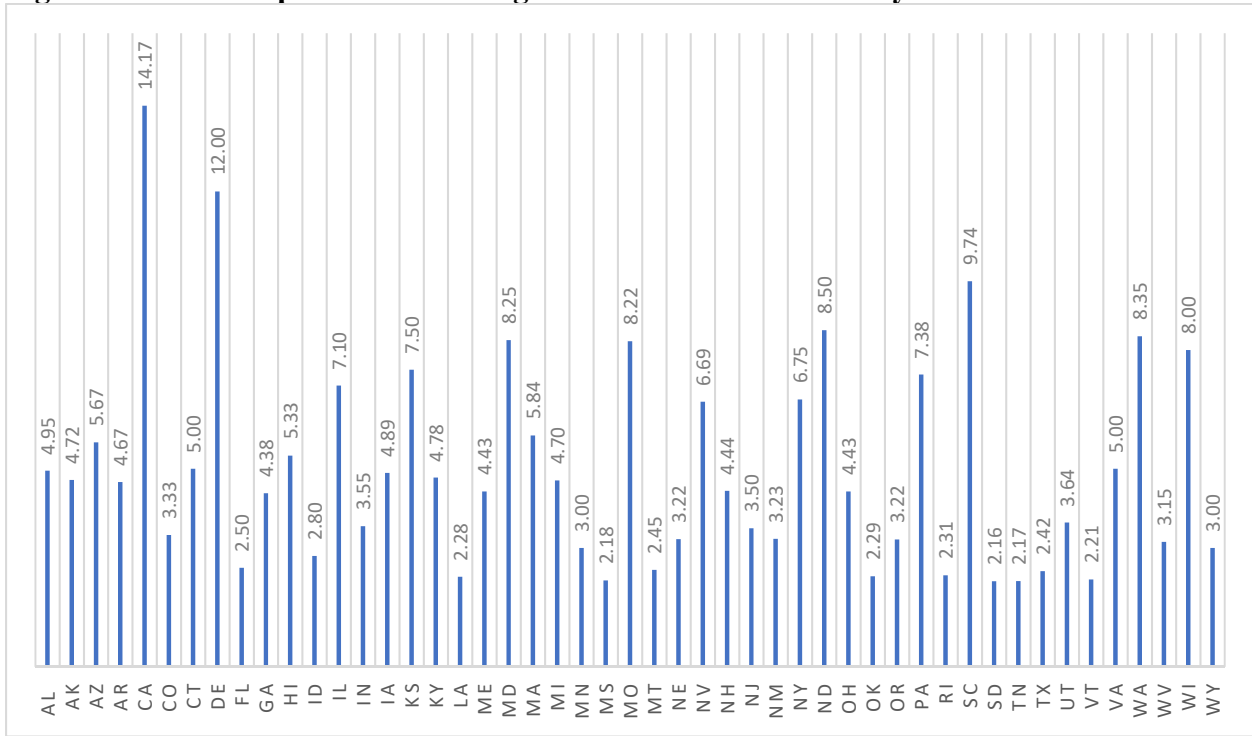
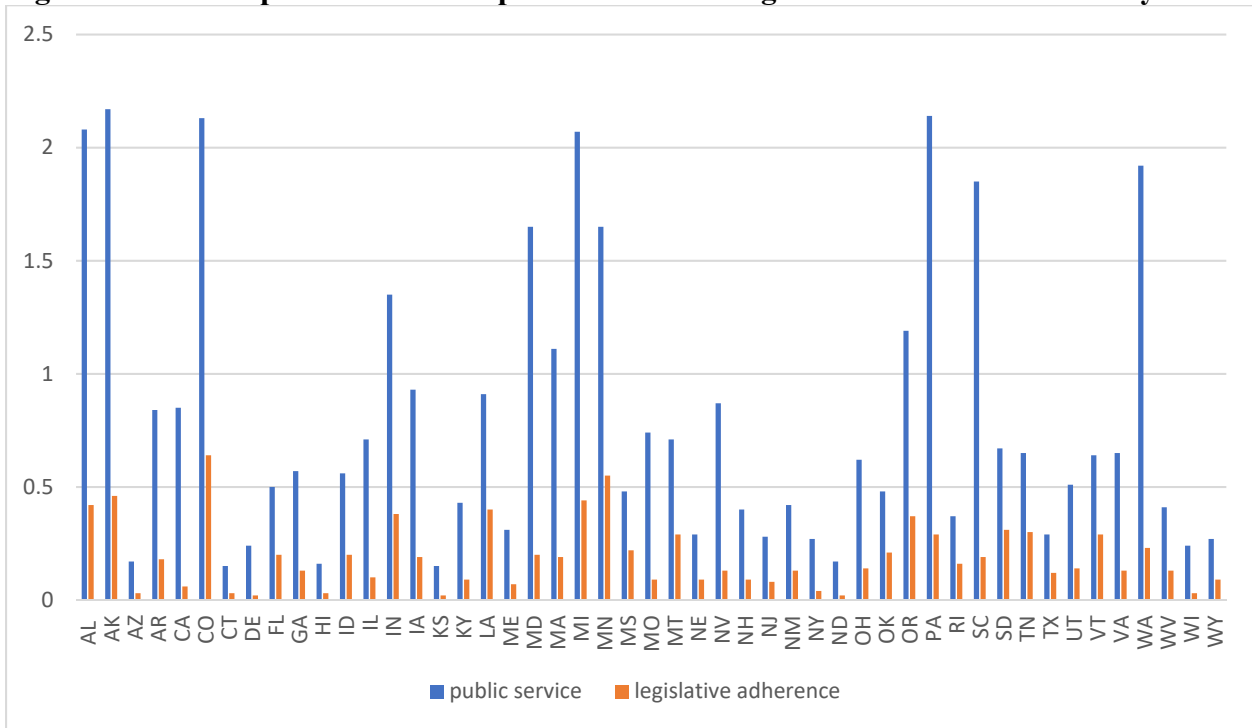


Figure D2. Words per thousand for public service vs. legislative adherence ethos keywords.



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