

Organizational Process, Rulemaking Pace, and the Shadow of Judicial Review

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Abstract

Scholars have long understood that structuring internal work processes into more hierarchical or team-based arrangements has consequences for organizational outputs. Building from these insights, this research examines how variation in the design of agency rulemaking procedures affects the resulting rules. Tracking job functions of rule contacts for economically significant rules proposed over a four-year period, the analysis demonstrates that expanding the breadth of personnel types closely involved in a rulemaking is associated with a reduction in the time it takes to promulgate the rule. However, increasing the pace at which rules are finalized is not without cost, as those finalized quicker appear more likely to be overturned when challenged in court. The study not only adds another dimension to empirical scholarship studying rulemaking which has largely focused on how forces originating outside the agency affect rules, but it also suggests the importance of considering competing priorities in designing rulemaking processes.

Evidence for Practice

- While most agencies promulgating rules incorporate the perspectives of a diverse set of employees, including subject matter experts, economists, and attorneys, they differ significantly with respect to when in the rulemaking process these viewpoints are consulted.
- Rulemaking processes that emphasize team-based structures, whereby relevant perspectives are included from the beginning, typically produce rules that are promulgated faster than hierarchical structures, where rules are primarily written by the program office and subject to later approval by other groups in the agency.
- Still, rules that are finalized quicker appear more likely to be overturned when challenged in court, suggesting that a tradeoff exists in using team-based organizational designs relative to more hierarchical approaches.
- Consistent with findings from studies of other organizational contexts, the noticeable differences in the timing and character of rules emanating from regulatory agencies using more team-based approaches are contingent on fostering greater breadth of core group members' competencies.
- Contrasting procedural requirements that agencies face, such as notice and comment and executive review, agency and departmental leadership typically have great latitude in structuring rulemaking processes in their organizations, suggesting a promising lever for managers to affect rulemaking outputs.

Finding ways to encourage agencies to increase the pace with which they promulgate rules is on a short list of the most persistent and complex issues occupying scholars of regulation. Many observers accept the notion that elongated timeframes are part of the rulemaking process, but less agreement exists on the causes of and potential solutions for alleged protracted timelines. One oft-cited reason for regulatory delay is the cumbersome requirements placed upon agencies by external actors such as Congress, the president, and the courts. For example, scholars have argued that the procedural constraints codified in the Administrative Procedure Act (APA) as well as those mandated through executive orders have caused the rulemaking process to become “ossified” (McGarity 1991a; Seidenfeld 1997; West 2005).

Just as forces originating outside the agency can affect how quickly rules are promulgated as well as how they are written, the ways in which processes are organized inside agencies can also be important to consider. The controversy that engulfed the Pipeline and Hazardous Materials Safety Administration (PHSMA) in 2015 and 2016 following a series of fatal explosions involving U.S. pipelines offers one example. In the wake of the accidents, PHSMA faced substantial criticism for its perceived inability to finalize rules to toughen pipeline safety standards in response to statutory deadlines imposed by Congress (Restuccia and Schor 2015). To explain the failure, media accounts fixated on efforts by oil and gas companies to slow down the rulemaking process at the agency.

Still, underlying the media’s focus on PHSMA’s relationships with its regulated entities, a report by the Department of Transportation’s (DOT) inspector general simultaneously highlighted the value of considering dynamics inside the agency as well to help explain the breakdown. Focusing on PHSMA’s rulemaking process, the inspector general (2016, 3) noted the agency had “not established policies or processes on rulemaking or implementing mandates

and recommendations that provide guidance to the program offices, the Chief Counsel, and the Chief Safety Officer (CSO) on how to fulfill their responsibilities for safety regulations ... This lack of sufficient processes, project management, and oversight ... impeded the Agency's ability to meet deadlines.”

The significance of internal structure has not been lost on scholars who study organizations broadly. Economists and organizational theorists have long debated the optimal structure of work processes, comparing those systems that emphasize traditional hierarchies to those that adopt more team-based approaches (Powell 1990; Williamson 1967). Moreover, while the empirical scholarship studying the organization of work processes has often focused on its role in driving results in firms, alternative methods for designing work flows based on team-based approaches are also increasingly being used in public organizations (Breul and Kamensky 2008).

Like organizational theorists, scholars of bureaucratic politics have recognized the key role that structure can play in shaping regulatory activities as well. This research has highlighted, for example, that internal organization impacts an agency's ability to cultivate a clear mission, manage goal ambiguity, and coordinate tasks to improve regulatory performance (Carrigan 2017; Eisner, Worsham, and Ringquist 2006; Wilson 1989). Additionally, others have shown how more collaborative structures and processes can lead to better regulatory outcomes as well as how such cooperation can be extended to include external stakeholders (Coglianese 1997; Fiorino 2006; 2009; Lubbers 2008; Rinfret 2011).

Despite these applications of organizational theory to the study of regulation more generally, less is known about how alternative organizational designs affect the specific rules promulgated by regulatory agencies across policy contexts (McGarity 1991b; West 2005). In fact, those who have employed large sample cross-sectional approaches to studying rulemaking have

traditionally focused on how those outside the agency, like interest groups and political overseers, can affect the pace of rulemaking and the characteristics of the resulting rules (e.g., Balla and Wright 2005; Shapiro 2002; Yackee and Yackee 2010; 2012). Of course, agencies do differ with respect to how they organize their processes for promulgating rules (Kerwin and Furlong 2010). Although many rely on variations of team-based approaches in which the rulemaking office coordinates the participation of various interests, others utilize hierarchical designs whereby a single office primarily manages the rulemaking process. Further, some agencies employ a combination of the two approaches, in which the lead office solicits the expertise of other parts of the agency as needed (McGarity 1991b).

In studying how regulators differentially organize their rulemaking efforts, this article offers the first systematic quantitative examination of how variations in internal rulemaking processes across a suite of federal agencies can affect the pace at which rules are promulgated as well as the properties of the rules themselves. The research sheds light on how differences in rulemaking processes between agencies might affect not only how quickly rules are formed but also the likelihood they will be invalidated by courts through judicial review. To do so, the analysis employs a novel dataset created by tracking the contacts listed in notices of proposed rules and proposed interim final rules for the set of economically significant rules that were submitted to the Office of Information and Regulatory Affairs (OIRA) by a broad set of agencies over the period from 2007 to 2010.

By ascertaining in which offices those contacts worked as well as what their job titles were and supplementing these data by appealing to agency documents outlining internal rulemaking procedures, this study seeks to uncover the processes these agencies use to prepare rules. Specifically, the data collection assesses the extent to which an agency's process emphasizes

breadth of expertise among those employees most closely involved in a rulemaking. Collecting information on both the time elapsed from the date of the submission of the proposed rule or proposed interim rule to OIRA to the promulgation of the final rule in addition to whether any portion of the rule was set aside when it was subsequently challenged in court, the article investigates the impact of organization design on the timeliness and character of agency rules.

The regression analyses suggest that increasing the diversity of personnel types most closely involved reduces the time it takes to promulgate rules. In addition to its statistical significance, the effect is meaningful, where adding another personnel grouping to the rulemaking effort is associated with over a 30 percent decrease in the number of days it takes to finalize the rule. Yet, at the same time, a statistically significant relationship also exists between the length of the timeframe to promulgate the rule and the probability at least a portion of it is subsequently invalidated through judicial review. In fact, a one standard deviation decrease in the timeframe to complete the rule is associated with over a seven percentage point increase in the likelihood that some part of it is set aside by a court. Moreover, the analysis employs a formal mediation test (MacKinnon, Fairchild, and Fritz 2007; Zhao, Lynch, and Chen 2010) to show that the collective pathway from agency structure to rulemaking pace to outcome in judicial review is statistically significant, thereby underscoring the importance of the linkages between the three variables.

Collectively, these results reveal that explaining variation in the timeliness and character of promulgated rules may require considering not only elements outside of the regulator's direct influence, but also those factors originating from within. Although regulatory scholars have demonstrated that procedural requirements, oversight, and interest group participation matter for the pace of rulemaking, this analysis similarly suggests that rule timelines can be sped up or slowed down based on how agencies choose to organize their rulemaking processes.

Considering the second set of regressions as well as the mediation model, the results also indicate the existence of tradeoffs in designing rulemaking procedures. Examining the impact of agency structure on rule timeliness raises the important question of whether expedited processes produce rules of lower “quality” than more extended timelines. Although quality can have many meanings in the regulatory context, including whether the agency complies with congressional and judicial deadlines or develops rules that meet legislative policy goals, avoiding successful legal challenges certainly appears to be one measure, at least from the agency’s perspective (Karkkainen 2002; Turner 2017; Wagner, Barnes, and Peters 2011). Thus, the fact that the results reveal that rules promulgated quicker also appear more likely to be overturned when challenged in court implies that agencies may have competing considerations when designing their processes. The presence of these rival effects could also explain why significant variation exists in how agencies approach their rulemaking endeavors. In sum, this article suggests that when it comes to organizing their processes for writing rules, agencies “can’t have their cake and eat it too.”

External and Internal Influences on Rulemaking

Partly in response to an influential set of legal studies during the early 1990s arguing the rulemaking process was ossified given the myriad of procedural requirements regulators face (Mashaw and Harfst 1990; McGarity 1991a; 1992; Pierce 1995), contemporary research studying regulation has sought to uncover the determinants of the timing and content of rules (e.g., Gersen and O’Connell 2008; Shapiro 2002; Yackee and Yackee 2010, 2012). In addition to considering procedures such as those associated with the APA, scholars in this tradition have demonstrated how interest groups and political overseers influence rulemakings (Balla 1992; Balla and Wright 2005; Yackee and Yackee 2006). This literature has yielded insights regarding how rules are

written as well as how quickly they are promulgated. For example, while procedures more generally may have less impact on rulemaking timeframes than typically thought (Yackee and Yackee 2010), agencies appear to be most responsive to comments by businesses in amending their rules during the notice-and-comment process (Yackee 2006).

In combination with Congress and the executive, courts also oversee the work of regulators through judicial review by which a rule can be remanded to the agency if it is deemed “arbitrary and capricious” (Melnick 1983; McGarity 1992). Using the initial “hard look” doctrine developed in the 1970s and 1980s, courts ascertained whether an agency followed a rigorous decision-making process that contemplated the entirety of the relevant evidence (Seidenfeld 1997). While the Supreme Court’s ruling in *Chevron v. Natural Resources Defense Council* relaxed the judiciary’s role in overseeing agency rulemaking, many scholars have asserted that the courts have further ossified rulemaking, leading agencies to turn to alternative tools such as policy statements and guidance as substitutes for rules (McGarity 1992; Pierce 1995).

Given the focus on pressures that originate outside the agency, the influence of internal organizational dynamics on rulemaking timeliness has often been overlooked, particularly with respect to studying variation across agencies (McGarity 1991b; West 2005). That said, a rich body of literature in bureaucratic politics has examined the role of agency design and organization in shaping agency outputs more broadly. As just one example, in his celebrated book, *Bureaucracy*, Wilson (1989) studies the effects of structure, organization, and the task environment on the observability of the agency’s outputs and outcomes.

Focusing more specifically on regulators, research has shown that the breadth of tasks assigned to the agency as well as how it assimilates those tasks can impact the stringency of regulatory oversight (Carrigan 2017; Gilad 2015). Eisner, Worsham, and Ringquist (2006), for

example, compare the Environmental Protection Agency (EPA) and Occupational Health and Safety Administration (OSHA) to explore how different agencies structure themselves to fulfill their enforcement, compliance, and regulatory missions. The authors find that EPA silos their employees such that scientists, engineers, and economists are tasked with rulemaking while attorneys and engineers are assigned the compliance and enforcement responsibilities. In contrast, OSHA uses project teams to “cross-train” its professionalized staff with respect to enforcement, compliance, and rulemaking tasks (Eisner, Worsham, and Ringquist 2006).

In a similar vein, scholars have also examined how cooperation and the use of collaborative tools in regulatory processes can improve the quality of the outputs. A central premise of this research stream is that agencies may be able to achieve better regulation by moving from hierarchical, top-down processes where the government is the primary actor to a model that relies on multiple actors from diverse networks working together to achieve regulatory goals (Fiorino 2006; 2009). Others have built on these insights to demonstrate how collaboration can extend to external stakeholders through mechanisms such as negotiated rulemaking, “reg neg lite,” and “shuttle diplomacy” (Coglianese 1997; Lubbers 2008; Rinfret 2011).

Yet while contributors to the literature on regulatory design have studied how organizational decisions impact regulatory outcomes more generally, few if any empirical studies have specifically looked across agencies to determine whether internal decisions concerning how to organize rulemaking tasks may affect the pace and quality of the resulting rules (McGarity 1991b; West 2005). For example, Kerwin and Furlong’s (1992) study of EPA rulemaking in the late 1980s included workgroup size as a variable in their analysis of rulemaking timeframes. Still, their research only considered one agency. This article seeks to help fill this gap by exploring the importance of agency rulemaking processes through the development of a

theoretical framework rooted in both the public and private organizational literatures coupled with a cross-sectional empirical analysis comparing the effects of different rulemaking approaches. In so doing, the research demonstrates that the ways in which agencies structure their rulemaking efforts can affect the speed at which rules are finalized as well as how likely they are to be able to withstand judicial review after they are promulgated.

Organizing the Rulemaking Process

As the complexity of rulemaking requirements has increased, so too has the need to consider the expertise of officials with diverse backgrounds and experiences to ensure rules are scientifically, economically, and legally sound (Kerwin and Furlong 2010; West 1988). To overcome the challenges associated with intra-agency coordination (Nou 2015), agencies take different approaches to organizing their rulemaking efforts. While McGarity (1991b) points to several possible models, most agencies use variations on two core organizing strategies, namely hierarchical and team-based approaches. These operate as the two extremes in design, with other structures falling between them (Seidenfeld 2002).

Under the hierarchical model, agency rulemaking is centralized whereby the subject matter program office takes the lead for drafting the regulation and supporting material. In a strict hierarchical design, the program office completes the draft rule, after which it is sent to other offices and ultimately senior executives whose approval is required before the proposed rule is sent to OIRA. Though the program office might prepare the required accompanying documents such as the benefit-cost analysis as well, these portions of the rulemaking package will typically be reviewed by an office dedicated to that activity during the approval process. The Department of Agriculture's Animal and Plant Health Inspection Service (APHIS) offers one example where a fundamentally hierarchical approach is employed. The rule lead from an APHIS program office

works with a writer from the regulatory analysis and development group to craft the rule. The draft rule is then sent through an internal clearance process that includes economists, attorneys from the general counsel's office, and political appointees at the agency and departmental level (APHIS 2000).

An alternative structure that is becoming increasingly more common is the team approach (Kerwin and Furlong 2010). This design is more decentralized than the hierarchical model, incorporating many of the elements of what organizational theorists refer to as self-managed teams (Pfeffer 1998). These workgroups typically comprise officials with a variety of competencies (McGarity 1991b) including:

1. *Subject matter program office personnel* who are the technical experts for the content of the rule and often lead the rulemaking process. Personnel from these offices are typically trained in a scientific or engineering field and have a technical problem-solving focus;
2. *Economic or policy analysts* who are responsible for producing the regulatory impact analyses required by OIRA. They determine the costs and benefits of the rule and possible alternatives that may provide greater net benefits;
3. *Attorneys* from the general counsel's office who are accountable for ensuring the agency has followed the proper procedures and that the rule is consistent with legislative intent and factual evidence;
4. *Regulatory affairs officials* who manage the timeline and procedural aspects of an agency's rulemaking process. They are often responsible for coordinating scheduling and preparing the agenda for workgroup meetings;
5. *Senior executives and political appointees* who manage the political hurdles that could jeopardize the rule such as OIRA review, competing interest group perspectives, and congressional opposition.

Although many of these same individuals have input in the hierarchical model, the difference between it and a rulemaking team is in the timing and extent of their participation. With teams, analysts and lawyers are involved from the onset whereas the hierarchical design involves them after the program office has prepared the draft. In a variation of the hierarchical model which McGarity (1991b) terms the "outside advisor" approach, the program office still

has core responsibility for drafting the rule but consults legal, policy, and other experts as needed in doing so. Although it includes other parts of the agency earlier in the process, this approach is still primarily driven by subject matter experts. As a result, the outside groups tend not to be as intimately involved.

Moreover, while most agencies have some variation of a regulatory affairs office, in a team, they assume the added responsibility of coordinating the involvement of its members (Kerwin and Furlong 2010). For example, the Federal Aviation Administration (FAA) has a dedicated office of rulemaking that manages its teams. These teams consist of a subject matter expert from an FAA program office (air traffic control, commercial air certification, etc.); a rulemaking analyst from the office of rulemaking; an attorney from the chief counsel's office; and an economist from the office of aviation safety and policy (FAA 2010). In addition to preparing the rule, the FAA rulemaking team sets a schedule for its finalization, including consultation with top level appointees as well as other principals whose operations may be affected by the rule.

Rule Timing, Durability, and Organizational Design

Although, as described, the empirical regulatory scholarship has often looked past internal factors in analyzing variation in agency rulemaking, the same is not true of the economics and organizational theory literatures, which have scrutinized the relative merits of organizing work processes into hierarchies or teams (Marschak and Radner 1972; Williamson 1967). In traditional hierarchies, authority is centralized under a high-level employee who makes decisions with input from lower-level officials through their valuations of the merits of the proposed decision (Gibbons 2003). As an alternative organizing principle, teams can be used to coordinate work and achieve organizational outputs. As one example, self-managed teams rely on

autonomous work groups which, while less reliant on a chain of command, are still specifically accountable for producing results (Gibson and Tesone 2001).

Given growing interest in utilizing less traditional organizational arrangements in the public sector (Robertson and Choi 2010), a developing set of studies has employed the insights from the literature studying teams to government operations (Yang and Guy 2004). For example, in their reflections on the Clinton administration's Reinventing Government initiative, Breul and Kamensky (2008) contrast traditional agency hierarchy with the "reinvention teams" each agency utilized to develop recommendations to improve government effectiveness. Moreover, in limited contexts, scholars have analyzed how working on self-managed teams impacts public servant satisfaction and organizational performance (Kalliola 2003). In one study, Yang and Guy (2011) use a survey of U.S. city government employees to describe how those assigned to such teams exhibit superior self-reported levels of esprit de corps and perceived goal attainment.

Given the depth at which hierarchical and team-based work arrangements have been examined, the organizational theory scholarship can help guide predictions about how variation in approaches to structuring internal rulemaking processes might be expected to impact agency rules. Considered efficient in the Weberian sense, scholars have nevertheless noted the paradoxical nature of hierarchical decision-making: while organized to be efficient, it often results in longer approval times because offices who may identify unintended consequences of a particular action are disconnected (Geanakoplos and Milgrom 1991; Sah and Stiglitz 1986). In the same way hierarchical decision-making can introduce delay as the number of approvals in the sequence grows, an agency rulemaking design which centers initial rule development in one program office – after which it passes through economic analysts, attorneys, and agency leaders – might be expected to face similar holdups. When a rule lacks meaningful input from other

offices early in the process, the probability it will need revisions as it moves through the internal approval chain increases (Eisner 1989). Thus, the hierarchical model might lead to longer overall rulemaking timeframes.

In contrast, those adopting a more team-oriented approach – particularly when the team employs a range of expertise – can increase the pace at which rules are finalized. Although some scholars have hypothesized that including regulatory agency officials from a variety of offices introduces tension, possibly leading to longer timelines (Kerwin and Furlong 1992; West 1988), the organizations literature offers numerous reasons why rulemaking teams composed of personnel with distinct roles might be more efficient. Contrasting teams with less diversity (including those primarily populated with program office personnel), representatives whose roles are distinguished from other members are likely to feel their participation is more critical, promoting accountability (Bantel and Jackson 1989; Bunderson and Sutcliffe 2002). In fact, evidence suggests that such diversity can deliver similar benefits in political contexts as well, including independent policymaking commissions and advisory committees (Krause and Douglas 2013; Moffitt 2014).

Moreover, when members fill distinctive roles, not only does the team benefit from specialization, but also its participants are not threatened by others with similar skills, thereby promoting an environment of psychological safety and encouraging information sharing (Baumeister, Ainsworth, and Vohs 2016; Bunderson and Sutcliffe 2002). Discord is reduced as territorial boundaries between group members become more clearly defined, and task coordination is made easier. A division of labor organized around the diverse skills of team members creates conditions whereby participants are more willing to defer to the expertise of the

individual in that role, mitigating conflict and resulting in fewer disagreements (Bunderson and Boumgarden 2010).

Applied to the regulatory context specifically, the features of relatively diverse teams – including increased accountability, greater information sharing, specialization, and diminished conflict – suggest that rulemaking workgroups should be able to reach quicker decisions than hierarchical arrangements whose subgroups will exhibit less differentiation. This is not to say there will be no dissent on a diverse team which may cause delay, particularly given the divergent perspectives of economists, lawyers, rulemaking process specialists, and subject matter experts (Eisner 1991; West 1988). However, a workgroup characterized by distinct member competencies can limit disagreements over particular issues based on who is the authority in that area, thereby speeding up the process of finalizing the rule and supporting documents.

Combining these elements suggests that:

H1: As the breadth of agency staff members materially involved in the production and management of a rule increases, the period of time needed to promulgate the rule will decline.

Still, using a team-based rulemaking model to potentially speed up the process of finalizing the rule does not mean that the quality of that rule will necessarily be better. For example, given the possibility that some will free ride since they benefit from the team's success even when they do not individually contribute to it, teams can struggle to produce good solutions (Zarraga and Bonache 2003). Team dynamics can also introduce biases, which lead to poor group decision-making. One example is groupthink, the well-known phenomenon in which the desire for group members to reach consensus stifles dissent and limits the number of alternative courses of action considered before a decision is made (Janis 1972). Another is group polarization, in which

groups can make more extreme decisions than even their members' initial preferences (Seidenfeld 2002; Sunstein 2000).

Some research has demonstrated that because members bring more varied perspectives, increasing diversity and creating distinct roles can help to constrain issues of groupthink and polarization as well as help limit social loafing (Bantel and Jackson 1989; Sunstein 2000). Nevertheless, certainly relative to hierarchical designs, these group pathologies may lead to workgroup decisions that are more apt to be viewed as “arbitrary, capricious, an abuse of discretion, or otherwise not in accordance with law,” which is the standard by which the APA instructs courts to determine whether to invalidate a rule (APA 1946).

At the same time, particularly for diverse teams where roles are clearly defined, the deference afforded members (Bunderson and Boumgarden 2010), which can serve to reduce the time needed to promulgate a rule, might also limit that rule's comprehensiveness, leaving the agency exposed during judicial review. If the workgroup defers to the expertise of, say, the team's lawyer without seeking other opinions within the agency, it will be more likely to have failed to consider all perspectives regarding the legality of a proposed rule, setting the stage for a successful challenge. Since members will not be peers with respect to the various competencies required to write the rule and its supporting documents (Kerwin and Furlong 2010; West 1988), they might find it difficult to debate the controversial but important details that could serve as the basis for a court decision that invalidates the rule later.

In a similar vein, the very fact that the rule is promulgated quicker might itself be an indicator that it is less likely to withstand judicial scrutiny. Scholars have noted that the regulatory process encourages agencies to write long, detailed rules and supporting documents to brace for review by OIRA and the courts (Carrigan and Shapiro 2017; Gailmard and Patty 2017;

Karkkainen 2002; Wagner, Barnes, and Peters 2011). Certainly, preparing comprehensive documents takes time, suggesting that those prepared quickly might, on average, be less thorough. In fact, evidence on the effects of statutory and judicial rulemaking deadlines suggests just this. While deadlines do seem to increase the pace of regulatory activity, they also appear to do so at the expense of the quality of the resulting rules or decisions (Carpenter et al. 2012; Gersen and O’Connell 2008; Lavertu and Yackee 2012). For these reasons, one might expect that:

H2: As the period of time to promulgate the rule declines (because the agency staff members that are materially involved in producing it occupy more distinct roles), the likelihood that the rule is invalidated through judicial review will increase.

Measuring Differences in Rulemaking Processes

To test these hypotheses, data were collected from two primary sources, OIRA’s [reginfo.gov](http://www.reginfo.gov) website and Thomson Reuter’s Westlaw database. The first includes all executive branch agency regulations reviewed by OIRA, including when the rule was received, when the review was completed, and its outcome. The data collection tracked all 232 completed evaluations of economically significant proposed rules and proposed interim final rules submitted to OIRA from 2007 to 2010, thus considering those rules likely to “have an annual effect on the economy of \$100 million or more” (OIRA 2015).¹ Given that the presidency transitioned from George W. Bush to Barack Obama in January 2009, focusing on the period between 2007 and 2010 accounts for differences when the White House is under Republican or Democratic control.

The second source, Westlaw, contains information on court cases relating to each section of the Code of Federal Regulations (CFR). This database was used to determine whether any section of the CFR changed or added through the final rule associated with an agency proposal was subsequently invalidated by a court after its promulgation. As explained in more depth

below, tracking judicial review outcomes requires focusing on final rules, given that proposed rules are not subject to review (APA 1946; Hylas 2017).

To form the independent variable measuring the breadth of agency expertise intimately involved in a rulemaking, every proposed rule and interim final rule was reviewed to determine each rule contact's role in developing it. Because listing agency personnel who can be contacted is standard for all rules, the dataset includes all contacts when the rule was published in the Federal Register. The database tracks agency contacts listed in proposed rules and interim final rules rather than the associated final rules to better capture the set of individuals who were most closely involved in shaping the rule. Even so, they are typically identical.

To assess the breadth of personnel intimately participating, the functions of the contacts were identified using their job titles.² In cases where the Federal Register notice was not adequate to establish what role a contact filled, internet searches were performed to determine that individual's job title at that time. Contacts were assigned into personnel groupings using the categories described in the previous section. These groups include legal staff, economic and policy analysts, subject matter experts from the associated program office, and regulatory staff. The contact groups variable, summarized in table 1, describes the number of groups represented by the contacts listed for the rule.

In addition to counting the groups associated with the contacts, the number of contacts was tracked as well. Including this variable in the regression analyses controls for differences in agency practices with respect how many contacts are typically listed in proposed rules. This mitigates the possibility that greater breadth of representation is simply a consequence of the fact that a rule lists more contacts. Effectively, by introducing the contact count, the coefficient on groups measures the effect of broadening the set of groups represented among a given number of

contacts.³ In addition to tracking the number of groups and contacts, a dummy variable – valued with a one when a chief, director, or administrator of the agency or a subcomponent was listed as a rule contact – captures whether agency leadership intimately participated.

[Table 1 here]

To determine the extent to which using the number of personnel groups represented among the agency contacts accurately captures differences between agencies in how they organize their rulemaking processes, two checks were performed. First, the authors interviewed a combination of six senior and lower level staff members at three departments, EPA, Health and Human Services, and DOT, who either recently supervised or currently supervise the rulemaking process or are or were participants in rulemakings at their agency. In each case, the interviewee confirmed that the contacts listed represent the personnel most closely involved in preparing that rule. Moreover, their characterizations of their agencies' rulemaking processes as either more team based or hierarchical concurred with the assessments using the contact data collected. Those who considered their operations more team based had more groups represented in their agency's rules in the database than those that thought their processes were more hierarchical.

Second, for each of the agencies in the initial database, internet searches were performed to gather all publicly available documents describing the internal rulemaking process utilized. The searches yielded usable information for 17 agencies and two departments. To classify each agency's rulemaking process, one of the authors and a research assistant independently reviewed the documents, assigning agencies to one of three categories depending on whether they used a hierarchical, outside advisor, or team-based approach. Agency designations were also assigned

using associated departmental-level documents when searches did not generate agency-specific data. Differences were reconciled through discussions to determine the most accurate characterizations.

Tests were then performed to determine whether the number of groups represented among the contacts is an accurate predictor of the agency rulemaking process as revealed through the document review. The overwhelming evidence suggests it is. Using an ordered probit model and assigning the manual categorizations as the dependent variable, where one is hierarchical, two is outside advisor, and three is team-based, the number of different personnel groups represented, controlling for the number of contacts, was positive and strongly significant ($p < 0.001$). These results indicate, as expected, that increasing the breadth of personnel groups intimately involved holding constant the number of contacts is associated with more team-based structures.⁴

To illustrate the variation among the 61 agencies in the database with respect to the types of personnel closely participating in rulemakings, figure 1 plots the average number of personnel groupings represented against the log of the average number of rule contacts for each agency. The figure demonstrates that substantial diversity exists between agencies in how they organize their rulemakings. For example, while the Department of the Interior's Fish and Wildlife Service (FWS) and EPA's Office of Solid Waste and Emergency Response (SWER) both averaged three contacts per proposed rule in the dataset, the degree to which they included various agency offices differed substantially.⁵ Only one FWS office was represented in each case, but at SWER, contacts were pulled from three personnel groups. In addition, as the figure shows, the average number of contacts is positively correlated with the number of groups represented, which is why the study's regressions control for contact counts. However, the figure also demonstrates the existence of numerous agencies such as FWS that have limited diversity in the types of

individuals represented as well as those like SWER in which the number of contacts, even if not large, still incorporates diverse personnel groups.

[Figure 1 here]

Significant variation exists between agencies within departments as well. Figure 2 highlights the diversity among DOT agencies. Instead of describing variance in terms of types of personnel, the figure illustrates how agencies differ with respect to whether they include agency legal and regulatory staff among their contacts. An agency that lists legal or regulatory office personnel is more likely to rely on a team approach. Conversely, a lower percentage of rules with legal or regulatory contacts indicates a more hierarchical process. As figure 2 illustrates, the FAA and National Highway Transportation Safety Administration often list legal and regulatory offices. In contrast, the Federal Motor Carrier Safety Administration never includes representation from the legal or regulatory offices among its contacts for proposed rules.

[Figure 2 here]

Given the hypotheses consider two sets of relationships, two primary dependent variables were prepared. The first, labeled review-to-rule time in table 1, operates not only as the dependent variable in the regressions used to test hypothesis one but also as the key independent variable in the regressions designed to test hypothesis two. The variable tabulates the number of days elapsed from when OIRA first received the proposed rule or proposed interim final rule to begin its review to the date the associated final rule was published in the Federal Register.⁶ In a

small number of cases where the agency proposed to OIRA and later published an interim final rule, but did not subsequently publish a final rule, the date the interim final rule was published becomes the date the rulemaking was completed. To mitigate any bias this might introduce, the regressions include a dummy variable, labeled interim final rule, in which a one signifies the rule OIRA received was a proposed interim final rule.

Admittedly, this study's measure of rulemaking time does not capture the portion of the rulemaking cycle where an agency begins developing the rule. Still, few alternatives exist (West and Raso 2012). For example, Kerwin and Furlong (1992) consult internal EPA documents to identify the starting dates of rulemakings at that agency specifically, but their approach is not amenable to the study of numerous agencies simultaneously. Moreover, although agencies are asked to disclose their early stage rulemaking projects in the Unified Agenda (UA), research suggests that they do so strategically, often not disclosing them at all until after the proposed rule is published (Nou and Stiglitz 2016).⁷ Nevertheless, the measure used for this study does capture more of the process than is typical in empirical studies of rulemaking, which generally consider publication of the notice of proposed rulemaking to be the starting point. Still, in order that the article's results might be more easily compared to the existing literature, the analysis also considers this more conventional measure, labeled notice-to-rule time in table 1.

The second dependent variable measures whether the rule was invalidated through judicial review, thus capturing if a court held as "unlawful and set aside" the agency's action when it was challenged in court (APA 1946). To track this variable, each final rule was reviewed to determine the sections of the CFR it either changed or added. Every section affected by the rule was then reviewed in Westlaw, which labels invalidated CFR sections as overturned, held invalid, or unconstitutional and cites the court case through which that determination was made.

The variable, labeled invalidated by court in table 1, receives a one if any CFR section affected by the rule was overturned subsequent to the date the final rule appeared in the Federal Register.⁸

In addition to the dependent and key independent variables described in this section, the regression analyses employ numerous additional measures, describing various features of the agencies proposing the rules, the political environment in which they were proposed, and the rules themselves. These variables include the associated agency's ideology in relation to that of the president when the proposed rule was submitted to OIRA; a measure of the agency's effective independence from politicians both with respect to appointing its key officials as well as reviewing its policies (Selin 2015); whether the executive branch agency is housed in a department; and the degree of diversity of an agency's policy environment (Workman 2015).

Moreover, given its importance for determining both how quickly a rule might be promulgated as well as how likely it is to be challenged successfully, a combination of six variables help capture various dimensions of the rule's controversy and complexity. They include the number of meetings held by OIRA with affected interest groups about the rule, the number of interest groups involved in those meetings, the number of public comments received on the proposed rule, and whether the rule has a deadline attached to it. The regressions further include a word count of the proposed rule or proposed interim final rule preamble. In presenting a summary, documenting the rule's justification, and reviewing alternative approaches considered, the preamble often varies based on the complexity of the issues considered and the anticipated controversy surrounding the rule. The analysis focuses on the proposed rule preamble because responses to comments assume the bulk of the final rule preamble, a feature already captured through the volume of comments.

Finally, the complexity and size of the task confronting the agency is accounted for by incorporating a word count of the public law sections authorizing the rule. To match a rule to its authorizing legislation, the legal authority field populated in OIRA's database was used, which duplicates the authority section in the Federal Register notice of the proposed rule.⁹ In cases where the agency referenced multiple public laws as the rule's legal authority, the data collection uses the most recent public law implemented prior to the rule's submission to OIRA. Incorporating the number of words associated with the relevant public law sections helps account for the possibility that the rule might take longer to promulgate and be more likely to be scrutinized in court because the agency must incorporate more public law provisions.

Given that the dependent variables measure time to promulgation of the final rule and whether that final rule was subsequently challenged successfully in court, the regression analyses do not include those rules proposed to OIRA but never finalized. Considering those rules that were ultimately finalized and contained values for the complete set of control variables, the regressions were performed using 176 of the 232 initial rules proposed to OIRA.¹⁰

Connecting Rulemaking Organization, Pace, and Review

Figure 3 visually depicts the set of relationships tested. The analyses first ask whether more closely involving a diverse set of competencies in the rulemaking process is associated with faster rule promulgation. Second, the investigation considers whether rules finalized sooner are more likely to be invalidated if they are challenged in court. In addition to testing these relationships separately, a formal mediation framework (Baron and Kenny 1986; Zhao, Lynch, and Chen 2010) is employed to study the pathway from organization to rulemaking speed to judicial review. To do so, the analysis evaluates the magnitude and statistical significance of what scholarship on mediation refers to as the "indirect" pathway (MacKinnon, Fairchild, and

Fritz 2007), computed as the product of the coefficient on the independent variable in a regression of the mediator on that variable and the coefficient on the mediator when the dependent variable is regressed on it and the independent variable (Zhao, Lynch, and Chen 2010).

[Figure 3 here]

The regressions in columns one and two of table 2 present tests of the first relationship in figure 3. Specifically, column one uses review-to-rule time, computed as the number of days from OIRA receipt to promulgation of the final rule, as the dependent variable. To examine whether the effect of personnel diversity is robust to changes in how rulemaking time is measured, notice-to-rule time, which represents the time elapsed from the notice of proposed rulemaking or interim final rule to the final rule, is substituted for review-to-rule time as the dependent variable. Table 2 indicates that doing so makes little difference.

[Table 2 here]

Interestingly, among the agency and political variables, only Workman's (2015) policy concentration measure reaches statistical significance in either regression.¹¹ The positive coefficient, indicating agencies with more concentrated policy agendas typically take longer to promulgate rules, may suggest these organizations face more focused interest groups, thereby fostering a more contentious rulemaking environment. The coefficients on the rule characteristics are similarly consistent across the two models, both with respect to their magnitudes and

significance levels. Among the six that consider various dimensions of the rule's complexity and controversy, the number of interest group meetings with OIRA has a statistically significant positive association with rulemaking time, as would be expected. However, the coefficient on statute length in the notice-to-rule model, significant at the 10 percent level, indicates a negative effect on the length of time to finalize a rule. This result is somewhat counterintuitive since trying to incorporate more public law provisions in a rule might be expected to extend a rulemaking. Finally, the coefficient on interim final rule proposals is strongly significant and associated with slower rule promulgation. While perhaps also initially surprising, this result might follow from the fact that once its interim rule is in place, an agency may have less pressure to finalize it since the interim rule has the force of law. Still, given that over 15 percent of the rules proposed to OIRA in the sample were for interim final rules and their use as a rulemaking tool continues to grow (Asimov 1999), this finding seems worthy of future consideration.

Turning to the variables created by analyzing agency rule contacts, the leadership personnel dummy does not reach statistical significance in either specification, nor does the number of contacts. Even so, as described, the number of rule contacts is included primarily to control for the possibility that differences across agencies in the number of groups represented could be driven by organizational practices in how they list contacts.¹² In fact, controlling for the number of contacts, contact groups is still statistically significant at the five percent level in both specifications. This result implies that among a given set of contacts, broadening the number of groups represented has a significant impact on how long it takes to finalize a rule. Moreover, the magnitudes across the models are numerically important in addition to being similar. Adding one more office, holding the number of contacts constant, is associated a 135 day reduction in the timeframe for finalizing a rule when that period begins with OIRA review and a 132 day

reduction when the clock starts with the notice in the Federal Register. For the average rule, these coefficients are associated with sizeable 31 to 37 percent reductions in the length of time an agency needs to finalize a rule, offering support for hypothesis one. Thus, increasing the diversity of personnel intimately participating in a rulemaking appears to shorten the time it takes to complete that rule.

The third and fourth regressions consider agency experience with judicial review. Column three is designed to place a spotlight on and test the second relationship in figure 3, that between rule timing and rule durability following promulgation. This regression offers the most direct evaluation of the downstream relationship between speed and court review in that the coefficient of interest also incorporates the portion of the effect of rulemaking time on the likelihood a rule is invalidated that is attributable to time's association with contact groups. In contrast, by including contact groups and rule contacts, column four considers whether review-to-rule time operates as a mediator by separating out the portion of the relationship driven by the direct effect of rulemaking organization on experience with judicial review. The coefficient on review-to-rule time in the fourth regression measures the effect of organization on the probability a court might invalidate the rule that operates through rulemaking speed specifically. For this reason, column four is more relevant to test the significance of the entire pathway in figure 3, instead of just the second half. It is also why this specification represents the second regression in the formal mediation analysis.

Just as the control variables demonstrated similar effects across the first set of regressions considering the impact of organization on rule timeliness, the coefficients on the variables measuring agency, political, and rule characteristics in the second set of regressions mirror each other as well. Among the rule characteristics, the number of meetings hosted by OIRA with

interest groups is associated with an increased likelihood that portions of the final rule will be invalidated. Because judicial review begins with a petition by an aggrieved party (Coglianese 1994), the positive relationship follows as more meetings signal the possible existence of more candidates motivated to file that petition. Moreover, a longer preamble is associated with a lower probability any part of the associated rule will be set aside, perhaps because a more detailed preamble suggests the agency has more carefully considered the potential issues with the rulemaking. With respect to agency characteristics, Selin's (2015) measure of effective independence is statistically significant at the 5 or 10 percent level, suggesting that agencies with more limits on political oversight of policy decisions and agency appointments are more apt to receive deference from the courts.

Considering the main relationship of interest, the coefficient on review-to-rule time in column three reveals a negative association between it and the likelihood that CFR sections changed by the rule are later set aside by a court. In addition to its statistical significance at the five percent level, the effect is sizeable. In fact, with a one standard deviation decrease in the number of days required to promulgate the rule, the probability a portion of it is invalidated increases by roughly 7.3 percentage points, measured at the means of the independent variables. Given that about 16 percent of the rules in the dataset were at least partially overturned, this effect is substantial.

The evidence from the specification in column four largely mirrors column three, but the significance level of the coefficient on review-to-rule time dips slightly below the five percent level ($p = 0.057$). However, given that this regression considers the effect of rulemaking speed on the agency's success in court eliminating that portion of the relationship explained by the association between timeliness and the agency's rulemaking processes, this is to be expected.

Moreover, the magnitude of the effect shows little change, reflecting a 7.1 percentage point increase in the likelihood that any portion of the rule is invalidated by a court for a one standard deviation decline in the timeline to promulgation.

Further, combining the evidence from the regressions in columns one and four indicates that rulemaking time operates as a mediator through which the effect of organization operates to impact court review. Because the effects are measured through different model formulations (ordinary least squares versus probit), assessing mediation requires rescaling the coefficients on contact groups in the first regression and review-to-rule time in the fourth regression, such that the indirect effect can be computed (MacKinnon and Dwyer 1993). Doing so reveals that the magnitude of the indirect effect is 0.0591, implying that a sizeable 41 percent of the impact that contact groups have on whether the rule is invalidated is explained by how groups affect rulemaking times. Moreover, this effect is statistically significant. A standard bootstrap test (Preacher and Hayes 2004) reveals that a 95 percent confidence interval around the indirect effect does not come close to passing over zero. Finally, the fact that the coefficient on contact groups is not statistically significant in the fourth regression suggests indirect-only mediation (Zhao, Lynch, and Chen 2010), meaning that rulemaking organization's effect on judicial review outcomes operates through its impact on timeliness but not also separate of it.

In sum, just as with hypothesis one, the regression results support hypothesis two as well. Decreasing the length of time to promulgate a rule is associated with a greater likelihood the rule is invalidated. Moreover, the effect of the breadth of expertise of those involved in the rulemaking on its timeliness operates as a pathway through which effects on later court review are felt.

Agency Tradeoffs in Designing Rulemaking Processes

Focusing on the criticism PHSMA endured for its perceived lassitude in promulgating rules in the wake of multiple pipeline accidents, this article began by suggesting that, relative to internal processes, commentators are more apt to look to influences outside the agency to explain rulemaking outputs. Nevertheless, the PHSMA case hints at the possibility dynamics inside the agency might be equally important. Tracking the diversity among personnel listed as contacts using the set of economically significant proposed rules and proposed interim final rules submitted to OIRA from 2007 and 2010, the evidence indicates that the significance of internal processes may not simply be isolated to a few select agencies.

The empirical analyses suggest that as the number of personnel groups (policy, legal, subject matter expert, etc.) closely involved in the rulemaking effort increases, the length of time needed to finalize the rule decreases, and the effect is statistically significant and meaningful. When one more group, holding constant the number of contacts, is included in the rulemaking effort, the time elapsed from OIRA receipt of the proposal to final rule promulgation declines by over 30 percent. Yet, quicker timeframes are associated with higher probabilities that at least some part of what is changed in the CFR by the rule will be invalidated by a court during judicial review. In fact, a one standard deviation increase in rulemaking pace is associated with over a seven percentage point increase in the likelihood that some part of that rule will be overturned. Moreover, applying a formal mediation framework suggests rulemaking pace operates as a mediator, forming a pathway by which organization affects oversight by the courts.

While this analysis offers perhaps the only large sample cross-agency assessment of the effects of internal design on rulemaking timing and judicial review outcomes, the results do accord with public administration and organizational theory research studying how internal

processes affect organizational outputs generally. Scholars in this tradition find that, relative to hierarchies, diverse teams experience greater member accountability and information sharing as well as increased willingness to acquiesce to others' distinct expertise, thereby mitigating disagreements. Given these elements may lead to quicker decision-making, it is not surprising this analysis finds that greater diversity among those contributing to a rulemaking seems to increase the pace with which the rule is produced. Similarly, research on organizations has shown that team dynamics can lead to weaker decisions through social loafing, groupthink, and polarization. Coupled with the fact that developing a comprehensive set of rule documents to withstand judicial review takes time (Karkkainen 2002; Wagner, Barnes, and Peters 2011), it follows logically that rules promulgated quicker are more likely to be set aside and that rulemaking organization has implications for court review through its effects on rulemaking speed.

In sum, much like the literature studying forces external to the regulator has shown how rules are affected by a wide range of procedural mechanisms (West 2005), this article's results suggest internal dynamics should not be ignored either. Yet, unlike constraints imposed on agencies externally, internal processes are rarely dictated by those on the outside. Instead, these organizational decisions are typically controlled by the agency's leadership. This point is concretely made by Jennifer Nou, who states, "While the APA mandates some features of the internal organization of adjudicatory actors, no analogous provisions exist for individuals engaged in rulemaking. Instead, many agency enabling acts are silent or ambiguous with respect to how agency heads can structure and select their rulemaking staff" (2015, 451). The fact that an agency's rulemaking process can have systematic impacts on the timing and character of its rules offers its leaders a vehicle to cultivate autonomy, at least at the margins of the procedural

burdens imposed on the organization. Agency management can thus use design to help achieve its preferences, regardless of whether they accord with political overseers or career staff.

Still, in making these choices, the evidence suggests that decision-makers face tradeoffs. In deciding to use a team-based approach, incorporating the involvement of a diverse set of competencies from the beginning, designers may be implicitly choosing to stress rule timeliness over resilience in judicial review. In contrast, in choosing a more hierarchical strategy, where key rulemaking decisions are centralized in the program office, an agency leader would appear to be emphasizing the ability for the rule to withstand court scrutiny relative to how quickly it is promulgated. The bottom line is that when it comes to designing their rulemaking processes, agency leaders are unlikely to be able to solve all potential problems simultaneously.

Connected to this point, given that the relationships uncovered in this article imply a tension in design between achieving rulemaking speed or durability, the diversity that exists with regard to how regulatory agencies promulgate rules should not be surprising. Thus, although organizational routine and inertia might certainly be factors in explaining why agencies set up their rulemaking processes in certain ways, the empirical results suggest good reasons why agencies might affirmatively choose to approach their rulemaking tasks in different ways.

Conclusion

In addition to highlighting the variation among federal agencies in how they organize their internal rulemaking processes, this study suggests these differences have tangible implications for rulemaking outputs. The article, thus, adds another dimension to the empirical scholarship analyzing the rulemaking process, which has largely focused on how forces outside the agency affect the timeliness and content of rules. Regulatory agencies that more intimately involve varied perspectives in their rulemaking efforts through team-based designs tend to promulgate

rules faster than their counterparts who choose more hierarchical structures which position rulemaking tasks in program offices that do not exhibit as much diversity. Yet, while increasing the diversity of representation to include lawyers, economic policy analysts, subject matter experts, and regulatory affairs officials can increase the pace at which rules are finalized, the empirical analyses further suggest that the increased speed comes at a cost. In fact, a rule promulgated quicker is also more likely to be set aside during judicial review. The mediation analysis presented provides further evidence that rulemaking organization's connection to judicial review outcomes comes through its impact on rulemaking pace.

Still, although this research reveals an interesting tradeoff in designing processes to produce timely rules that can also withstand judicial review, it simultaneously raises several questions and possibilities for additional investigation. For example, while advocating for the importance of considering internal agency structures in addition to external forces to explain agency rulemaking, the results are nevertheless generated through a cross-sectional study of economically significant rules over a specific four year period. Thus, whether the insights would apply, for example, to rulemakings with less significant consequences or during a different timeframe is an open question.

Similarly, given the research strategy employed, future research might also test the article's conclusions using approaches designed to more convincingly demonstrate causation, including experiments and panel data methods. The rule contacts data and internal agency documents collected as part of this study revealed that most agencies do not vary their rulemaking structures much. Still, some like EPA do, tending to choose team-based rulemaking for those rules with greater potential impacts (EPA 2011). This specific effect would seem to bolster the results, suggesting that perhaps the magnitude of the coefficient associated with the article's finding that

greater breadth is associated with shorter timeframes represents more of a lower bound for the effect. Nevertheless, more careful study of those agencies that do vary their processes might offer a way to limit potential endogeneity and form more precise understandings of the relationships between rulemaking processes and outcomes.

In addition, although this research is partially motivated by and has produced results consistent with studies considering organizational dynamics in the public administration and organizations literatures, it does not directly test the mechanisms by which rulemaking process impacts outputs. In considering the relative importance of potential causes of organizational dysfunction, including groupthink, conflict, and free riding, additional analysis – perhaps through interviews of rulemaking personnel – could delineate what exactly drives the differences observed in rulemaking timeliness and durability based on variation in the breadth of expertise of those involved.

Finally, while the analysis studies how the design of an agency's internal processes affects one dimension of competence in rulemaking – namely the agency's ability to withstand judicial scrutiny – certainly other possible metrics exist. Some possibilities may include the extent to which the agency meets its targeted timeframes for promulgating the rule (Lavertu and Yackee 2012), the likelihood the rule is ever promulgated, the degree to which the rule is comprehensive, coherent, and well written, and whether the agency achieves the policy goals laid out by lawmakers through its rules. By considering these possibilities, future research on the regulatory process can offer a more balanced perspective on how elements emanating from within the agency interact with those originating externally to impact a rule's content, quality, and timing.

Notes

1. The analysis includes proposed interim final rules because they follow a process that is similar to that for proposed rules. After they are promulgated, agencies receive and respond to comments before finalizing the rule sometime later (Asimov 1999).
2. Doherty, Lewis, and Limbocker (2015) use a similar approach in their study of rulemaking personnel turnover.
3. Whether the number of contacts is included does not affect the direction or significance of the coefficients on the number of groups or rulemaking time in the regression models. Moreover, the models do not include an interaction term of the number of contacts and number of groups because the hypotheses do not predict how the effect of the number of groups on rulemaking time should change based on the number of contacts.
4. Though the two measures of structure are highly correlated, using the categorizations as another dependent variable in the empirical analyses was not feasible because doing so would have substantially reduced the dataset size. Moreover, using the breadth of contacts offers the advantage of providing a continuous measure that allows for the possibility that agency processes could change by rule and over time.
5. Consistent with these findings, as part of the document review, FWS was shown to follow a hierarchical rulemaking process whereas EPA typically uses working groups for its most significant rules (EPA 2011; FWS 2017).
6. In cases where the final rule was later amended, the analysis uses the date of the initial final rule as the ending date given that the key elements of the rule were likely decided at that point and that the subsequent final rule, especially if it was well after the initial final rule, would probably have been submitted to OIRA again.
7. A review of the data collected for this article supports the conclusion that agencies strategically disclose rules in the UA. Almost one quarter of the rules first appear in the UA after the proposal is received by OIRA, and 45 percent of those rules first enter the UA more than 90 days later. Another option to try to capture the complete rulemaking cycle would be to begin with the date the public law authorizing the rule was passed. However, even when focusing on the most recent statute cited, the resulting timeframes can be unrealistic if an agency, for example, cites its organic statute which authorized its creation many years before the rulemaking.
8. Although the measure captures all cases in which the court reached a decision, Westlaw does not track instances where the parties settled. In addition, Westlaw occasionally updates the case history for certain CFR provisions. Still, since these potential measurement errors affect the dependent variable, as long as they are not correlated with a key independent variable, the associated regression will still produce a consistent estimator (Wooldridge 2002).
9. In some cases, this field referred not to specific public laws but to sections of the U.S. code. To track back to the associated public law, portions of the U.S. code that listed the sections of

the public law or laws from which the code was created were reviewed. These public law sections were considered the authorizing statutes.

10. The specifications do not include agency fixed effects because 40 percent of the agencies have only one rule in the final dataset. Moreover, of those remaining agencies with multiple rules, just under 60 percent did not alter the number of groups represented among their rules, making incorporating agency fixed effects impracticable.
11. The specifications in table 2 use a measure of political ideological agreement that assesses the degree of agreement between the agency and the president as of the date when the proposed rule or proposed interim final rule was submitted to OIRA to capture the political environment at the time of the rulemaking. The results were not affected when similar measures, computed using the date the proposed or interim final rule was published or the date the final rule appeared in the Federal Register, were substituted into the models.
12. Regardless, whether the number of rule contacts is included has no impact on the significance level, direction, or magnitude of the coefficient on contact groups for any of the regressions.

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Table 1 – Variable Descriptions and Summary Statistics

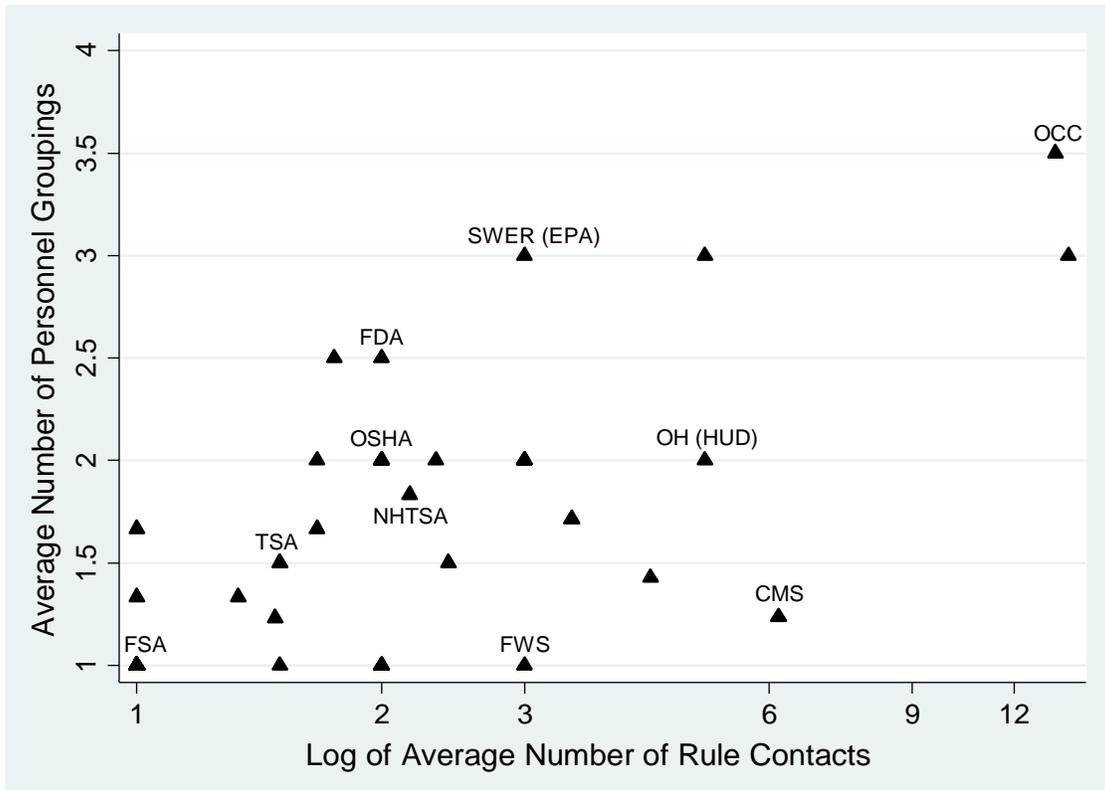
Variable	Description	Mean	Median	Std. Dev.	Min	Max
Review-to-Rule Time	Time elapsed in days from date when proposed rule or proposed interim final rule was received by OIRA to date final rule was published in Federal Register.	430.3	282	445.6	6	2,643
Notice-to-Rule Time	Time elapsed in days from date when proposed rule or interim final rule was published in Federal Register to date final rule was published in Federal Register.	360.3	217	429.3	0	2,555
Invalidated by Court	Indicates whether any CFR section updated or added by final rule was later invalidated through judicial review. If yes, variable receives value of 1. If no, variable receives value of 0.	0.162	0	0.369	0	1
Contact Groups	Number of groups represented by agency rule contacts listed in notice of proposed rule or interim final rule from among four personnel groupings involved in rulemaking: economic and policy, legal, regulation, and subject matter. Function each contact performed determined by looking at job title provided in notice. Where insufficient information given in notice, internet searches performed to determine job title.	1.40	1	0.626	1	4
Rule Contacts	Number of agency personnel listed in notice of proposed rule or interim final rule as contacts for further information.	2.97	2	3.91	1	33
Leadership Personnel	Indicates whether a chief, director, or administrator of agency or agency subcomponent listed as contact for proposed rule or interim final rule. If yes, variable receives value of 1. If no, variable receives value of 0.	0.358	0	0.480	0	1
Interim Final Rule	Indicates whether proposal sent to OIRA was to promulgate an interim final rule. If yes, variable receives value of 1. If no, variable receives value of 0.	0.159	0	0.367	0	1
Deadline	Indicates whether authorizing legislation imposed deadline on when rule must be promulgated according to OIRA's database. If yes, variable receives value of 1. If no, variable receives value of 0.	0.422	0	0.495	0	1
Preamble Length	Word count of Federal Register notice of proposed rule or interim final rule, including only preamble and not rule.	48,962	28,299	58,076	818	357,457

Variable	Description	Mean	Median	Std. Dev.	Min	Max
Statute Length	Word count of specific provisions of public law which provided legal authority for rule. Where legal authority was given as U.S. code, relevant code sections were reviewed to find public law from which code section created. Where multiple public laws cited in OIRA's database or in U.S. code, last law in chronological order used.	39,303	1,474	97,646	11	416,246
Meetings with Interests	Count of number of meetings with interest groups for each rule. Obtained from OIRA's website.	1.44	0	3.84	0	47
Number of Interest Groups	Count of number of interest groups who met with OIRA for each rule. Obtained from OIRA's website.	3.62	0	10.62	0	134
Number of Comments	Count of number of comments received by agency for proposed rule or interim final rule. Obtained from regulations.gov.	11,110	130.5	52,167	0	457,561
Obama in Office	Coded as 1 if OIRA received proposed rule or proposed interim final rule during period in which President Barack Obama occupied White House and 0 if rule received when President George W. Bush occupied White House.	0.534	1	0.500	0	1
Agency Ideology	Variable obtained from Stuart Kasdin (Kasdin and Lin 2015). Numerator is ratio of agency's average discretionary budget (using real dollars) for those years in which Congress controlled by Democratic party to agency's average discretionary budget in years in which Congress controlled by Republican party from 1976 to 2008. Denominator is same ratio but includes all agencies. Reported as natural logarithm of ratio of ratios.	0.022	-0.023	0.237	-1.136	1.331
Ideological Agreement	Computed using agency ideology and Obama in office variables. When President Bush in office when proposed rule or proposed interim final rule submitted to OIRA, agency ideology score of Republican agencies (those with negative scores on agency ideology) made positive, and agency ideology score of Democratic agencies made negative. When President Obama in office, Republican agencies made negative, and Democratic agencies made positive.	0.015	0.023	0.238	-0.856	1.331

Variable	Description	Mean	Median	Std. Dev.	Min	Max
Effective Independence	Variable obtained from Jennifer Selin (2015) where larger values signify greater independence. Measures independence in terms of limits on both appointments of key decision-makers and review of agency policy by politicians.	-0.110	-0.444	0.575	-0.515	2.256
Non-Departmental Agency	Coded as 1 when executive branch agency proposing rule not located in an executive department. When agency located in an executive department, code as 0.	0.164	0	0.371	0	1
Policy Concentration	Variable obtained from Samuel Workman (2015) where larger values signify more concentrated agenda (i.e. agency spends more time on less diverse set of issues). Computed score as average of policy concentration scores for Republican and Democratic administrations.	0.531	0.569	0.185	0.149	0.827

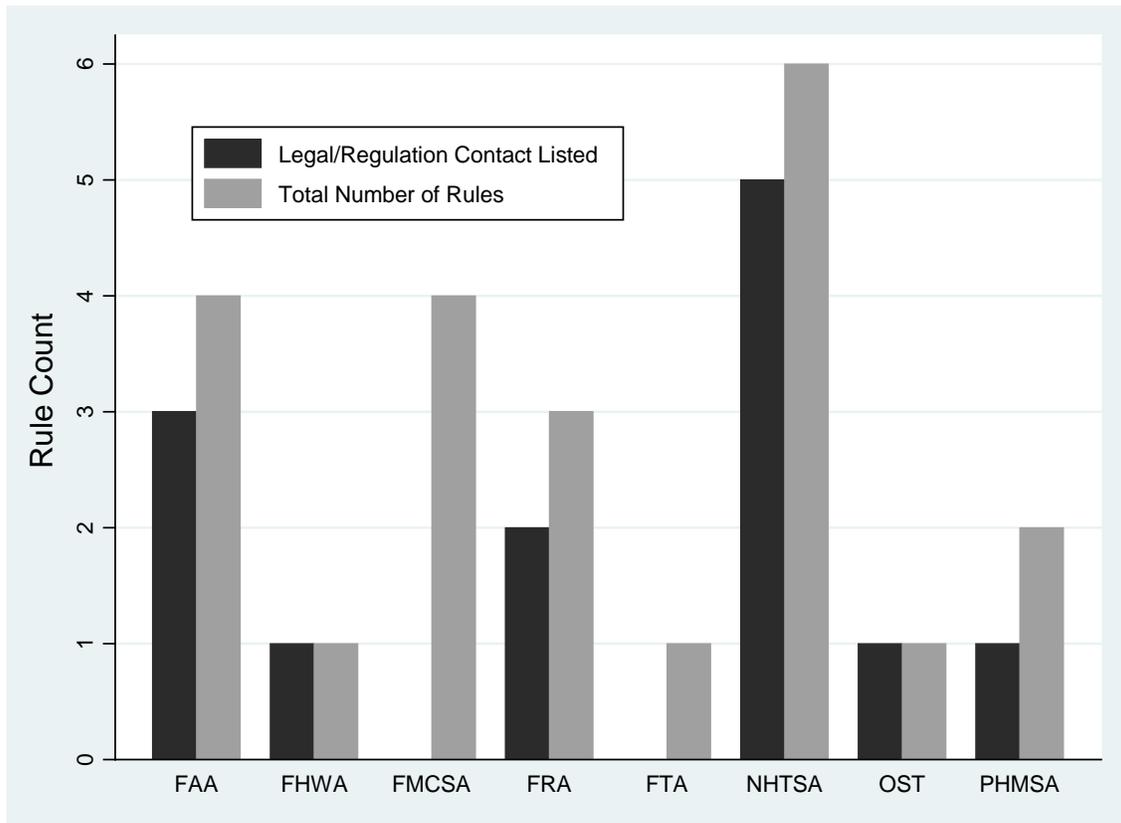
Note: The rule data reported were primarily derived from OIRA's reginfo.org website and incorporate all economically significant proposed rules and proposed interim final rules submitted to OIRA during the period from 2007 through 2010.

Figure 1 – Organizational Differences in Agency Rulemaking Processes



Note: The triangles represent the average number of rule contacts and personnel groupings among the contacts for specific agencies. The total number of agencies in the database exceeds the number of triangles since some triangles represent more than one agency. Personnel groupings are determined by identifying the job functions of contacts listed in notices of proposed rules and interim final rules and categorizing them into one of four types: economic and policy, legal, regulation, and subject matter expert. All economically significant proposed rules and proposed interim final rules submitted to OIRA which had a corresponding Federal Register notice over the period from 2007 through 2010 as reported in OIRA’s database at reginfo.org were used for the computations.

Figure 2 – Variance in Legal and Regulatory Representation among U.S. Department of Transportation Agencies



Note: The darker shaded bars measure the number of rules in which the contacts included personnel from the legal or regulatory groups of that DOT agency. The lighter shaded bars measure the total number of rules for each agency. Agencies without any economically significant proposed rules or proposed interim final rules are not listed. The agencies shown are the Federal Aviation Administration (FAA), Federal Highway Administration (FHWA), Federal Motor Carrier Safety Administration (FMCSA), Federal Railroad Administration (FRA), Federal Transit Administration (FTA), National Highway Traffic Safety Administration (NHTSA), Office of the Secretary of Transportation (OST), and Pipeline and Hazardous Materials Safety Administration (PHMSA).

Figure 3 – Relationships between Rulemaking Organization, Rule Timeliness, and Judicial Review

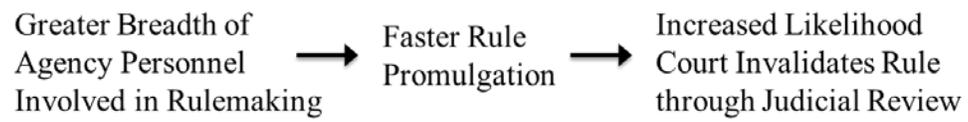


Table 2 – Regressions of Rulemaking Timeliness and Judicial Review

Variable	Review-to-Rule Time	Notice-to-Rule Time	Invalidated by Court (1)	Invalidated by Court (2)
Review-to-Rule Time	---	---	-0.000860** (0.000436)	-0.000843* (0.000443)
Contact Groups	-134.68** (62.02)	-131.75** (60.03)	---	0.166 (0.248)
Rule Contacts	-14.54 (8.95)	-12.21 (8.67)	---	0.0206 (0.0349)
Leadership Personnel	-8.75 (80.12)	-15.57 (77.55)	-0.134 (0.321)	-0.122 (0.330)
Interim Final Rule	286.02*** (97.78)	313.56*** (94.64)	-0.311 (0.460)	-0.352 (0.472)
Deadline	-60.42 (72.40)	-61.39 (70.08)	-0.403 (0.278)	-0.362 (0.289)
Preamble Length	-0.952 (0.636)	-0.903 (0.616)	-0.0055* (0.0029)	-0.0062* (0.0032)
Statute Length	-0.543 (0.372)	-0.620* (0.360)	-0.0010 (0.0016)	-0.0010 (0.0016)
Meetings with Interests	77.01** (30.11)	59.55** (29.15)	0.248** (0.118)	0.252** (0.119)
Number of Interest Groups	-15.50 (11.00)	-11.18 (10.64)	-0.0345 (0.0431)	-0.0333 (0.0434)
Number of Comments	-1.19 (0.78)	-1.11 (0.75)	-0.0016 (0.0026)	-0.0014 (0.0027)
Ideological Agreement	149.62 (143.40)	148.77 (138.80)	0.636 (0.551)	0.611 (0.555)
Effective Independence	-14.72 (69.01)	-12.14 (66.80)	-1.08* (0.59)	-1.14** (0.58)
Non-Departmental Agency	-109.96 (138.55)	-152.15 (134.10)	0.480 (0.654)	0.608 (0.664)
Policy Concentration	526.20** (256.36)	614.25** (248.13)	1.79 (1.11)	1.57 (1.14)
Constant	432.12*** (154.48)	317.28** (149.52)	-1.64** (0.63)	-1.86*** (0.70)
Observations	176	176	176	176
F-statistic (d ₁ ,d ₂) / LR Chi-square (df)	2.61 (14,161)	2.58 (14,161)	26.60 (13)	27.38 (15)
R ² / Pseudo R ²	0.185	0.183	0.169	0.174
Adjusted R ²	0.114	0.112	---	---

Note: For the first specification, the dependent variable is review-to-rule time, which is the time elapsed in days from the date when the proposed rule or proposed interim final rule was received by OIRA to the date the final rule was published in the Federal Register. For the second, the dependent variable is notice-to-rule time, measured as the time elapsed in days from the date the proposed rule or proposed interim final rule was published in the Federal Register to the date the final rule was published in the Federal Register. For the third and fourth specifications, the dependent variable is invalidated by court, which is a dummy variable that receives a one if any CFR section updated or added by the final rule was later declared invalid through judicial review and a zero otherwise. Preamble length, statute length, and number of comments are each in thousands to aid interpretation of the associated coefficients. A dash indicates that the variable is not included in the regression specification. Standard errors are in parentheses. Tests of significance are two-tailed tests of difference from zero. Significance levels: *** implies $p < 0.01$; ** implies $p < 0.05$; * implies $p < 0.10$.