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JOHN M. OLIN CENTER FOR LAW, ECONOMICS, AND BUSINESS

BUREAUCRATIC DECISION COSTS
AND ENDOGENOUS AGENCY EXPERTISE

Matthew C. Stephenson

Bureaucratic Decision Costs and Endogenous Agency Expertise [*]

Matthew C. Stephenson[†]

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Abstract

This paper analyzes the impact of bureaucratic decision costs on agency expertise. The analysis shows that the effect of the cost associated with adopting a new regulation (the "enactment cost") on agency expertise depends on what the agency would do if it remains uninformed. If an uninformed agency would regulate, increasing enactment costs increases agency expertise; if an uninformed agency would retain the status quo, increasing enactment costs decreases agency expertise. These results may influence the behavior of an uninformed overseer, such as a court or legislature, that can manipulate the agency's enactment costs. Such an overseer must balance its interest in influencing agency policy preferences against its interest in increasing agency expertise. The paper explores the implications of these results for various topics in institutional design, including judicial and executive review of regulations, structure-and-process theories of congressional oversight, national security, criminal procedure, and constitutional law.

JEL classification: D73, D83, K23, K32.

The delegation of substantial policymaking authority to administrative agencies is often both explained and justified by the belief that agencies have more accurate information about the actual impacts of different policy choices. Consider, for example, the decision whether to ban a toxic substance like asbestos. A common argument for delegating this decision to the Environmental Protection Agency (EPA), rather than leaving the decision to Congress, is that the EPA has greater expertise about the likely effects of the proposed ban, including more accurate estimates of projected health benefits and economic costs. At the same time, delegation entails the risk that agencies will exploit their policy-making discretion to pursue goals that diverge from those of the electorate and its representatives. The EPA, for example, might be more zealous than the median member of Congress, leading the agency to ban asbestos under circumstances in which Congress, if fully informed, would not. The informational asymmetry that justifies the delegation in the first place makes it difficult for Congress, courts, or other overseers to monitor the agency.

A rich literature in political science, economics, and law considers institutional mechanisms that less-informed overseers, such as politicians and courts, may employ to induce better-informed agencies to make decisions that more closely track the overseer's policy preferences. This literature, however, typically assumes that agency expertise is exogenous—a given characteristic of the agency that is independent of the scope of the delegation, other aspects of the institutional environment, and the agency's own choices. That assumption, although often a useful simplification, is problematic. Although we may say that the EPA has expertise regarding environmental regulation as a general matter, the EPA may only be able to learn about the likely effects of a specific proposal, such as the asbestos ban, by investing scarce resources (e.g., staff, money, time) into data collection, analysis, consultation with outside parties, and similar activities. In turn, the agency's decisions regarding how much effort to devote to such investigative activities may depend on the institutional structures and incentives created by Congress, courts, and other overseers. Agency expertise, on this view, is endogenous.

This paper contributes to an emerging literature on the implications of endogenous agency expertise for analyses of bureaucratic politics and public law. In particular, the paper develops a model to address two related questions. First, how do changes in the cost associated with adopting a new regulation—costs that may arise, for example, from the imposition of cumbersome procedures—affect an agency's probability of learning more accurate information about the likely effects of that regulation? That is, how does a change in the *enactment cost* affect agency expertise? Second, how would an overseer with the power to manipulate the agency's enactment cost (e.g., a court, legislature, or executive oversight agency) exercise this power when agency expertise is endogenous? In other words, what is the *optimal enactment cost* from the overseer's perspective?

On the first question, the analysis reveals that the effect of the enactment cost on agency expertise depends on what the agency would do if its efforts to acquire additional information are unsuccessful. If an uninformed agency would maintain the status quo, then an increase in enactment costs will *decrease* agency expertise. If an uninformed agency would regulate, then an increase in enactment costs will *increase* agency expertise. This follows from the fact that an agency's incentive to acquire information is maximized when the uninformed agency is indifferent between regulating and maintaining the status quo. So, a change in enactment costs that moves the uninformed agency toward this indifference point will increase agency expertise, but a change that moves the uninformed agency further away from indifference will decrease agency expertise.

On the second question, the analysis demonstrates that the overseer's optimal enactment cost is influenced by two potentially competing goals. First, the overseer would prefer to adjust the enactment cost to align the agency's policy preferences more closely with the overseer's. However, the enactment cost can also affect the overseer's utility indirectly by influencing the agency's expertise. The overseer's optimal enactment cost must be sensitive to both these concerns, and this can lead to counterintuitive predictions. For example, even an overseer that is more sympathetic to regulation than the agency may prefer to impose

enactment costs if this has a sufficiently positive effect on agency expertise. Likewise, even an overseer that is more skeptical of regulation than the agency may, under some circumstances, prefer an "enactment subsidy" (i.e., a negative enactment cost) if this induces a sufficiently large increase in the agency's expertise, and, consequently, fewer erroneous decisions from the overseer's perspective.

These results have implications for an array of ongoing debates in administrative law and politics, including the role and function of judicial review, the impact of regulatory oversight conducted by the Office of Management and Budget, and the legislature's use of so-called structure-and-process devices to control the bureaucracy. The model also has implications for other issues in public law, including the appropriate degree of congressional or judicial oversight in the context of both national security matters and ordinary criminal investigations, as well as judicial enforcement of various constitutional restrictions on legislative power.

1 Agency Expertise and Bureaucratic Oversight

Most contemporary analyses of bureaucratic policymaking assume a principal-agent problem in which a less-informed principal, usually a legislature, delegates some degree of policy discretion to a (potentially) better-informed bureaucratic agent, but tries to structure the delegation and the institutional environment in order to minimize "bureaucratic drift"—the degree to which the agency pursues goals that diverge from those of the principal (McCubbins, Noll and Weingast 1989; Horn and Shepsle 1989; Shepsle 1992). The assumption that the agency has greater expertise (that is, a higher probability of having superior information about the actual effects of various policy choices[1]) is central to these analyses, both because the agency's greater expertise is often used to explain the initial delegation of authority, and

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[1]I use the term "expertise" to refer to the probability of acquiring additional relevant information. "Expertise" might be used in at least two other senses, however. First, it might connote actually having additional information. Second, it might indicate that an actor can improve its probability of learning additional information at low cost. All of these characteristics are included in the model. My use of the word "expertise" to describe only the first is an arbitrary expositional choice.

because the informational asymmetry is what makes the oversight problem so interesting and challenging.

Despite the breadth and sophistication of the literature on this topic, most of this literature assumes exogenous agency expertise. There are some important exceptions, however. In one of the first papers to address the endogenous expertise issue explicitly, Bawn (1995) analyzed the trade-off between bureaucratic expertise and political control by assuming that an agency's incentive to acquire expertise is positively correlated with the scope of its discretion. In Bawn's model, though, this correlation is assumed rather than derived. In another seminal contribution, Aghion and Tirole (1997) demonstrated that one of the main benefits of delegating power to a bureaucrat is the incentive this creates for the bureaucrat to acquire information.

More recently, Bendor and Meirowitz (2004) have extended this line of argument by showing that, when information is costly to the agency and the legislature is able to commit to delegation, the legislature may prefer to delegate to a bureaucrat with policy preferences that are relatively far from the legislature's own, because only such a bureaucrat would be willing to invest in information. Similarly, Gailmard and Patty (2006) have investigated the relationship between bureaucratic autonomy and bureaucratic expertise, using a career incentives model in which a bureaucrat's investment in job-specific competence is shown to be positively related to the scope of her policymaking autonomy. Szalay (2005) provides an interesting variant on this theme by showing that under certain conditions a principal may prefer to eliminate the agent's authority to adopt "intermediate" options, because forcing the agent to take a relatively extreme position increases its incentive to invest in information. Feldmann (2005) also finds that legislatures can increase bureaucratic expertise by constraining bureaucratic discretion; in Feldmann's model, legislators can accomplish this by preventing the agency from taking actions that are too adverse to the interests of private groups that may possess policy-relevant information, as this increases the group's incentive to disclose what it knows. Callander (2006) has further extended the analysis of the

delegation-expertise relationship by developing a model in which the legislature is unable to commit to delegating authority, but there is uncertainty over the relationship between policy processes and outcomes. In Callander's model, agencies are willing to invest in expertise, and legislatures are willing to delegate, only when the relationship between processes and outcomes is sufficiently complex.

These contributions all focus on the relationship between the agency's expertise and the scope of its discretion. But, while expanding, contracting, or otherwise limiting agency discretion is one important tool for influencing bureaucratic policymaking, it is hardly the only one. Nor is it obviously the most effective one. In particular, an overseer can also influence agency policy by making certain choices more or less costly relative to others. For example, the legislature might require the agency to use burdensome procedures before it undertakes certain kinds of action, or the legislature might structure the agency's decision-making process such that certain interest groups have more or less influence. This, in turn, makes particular courses of action more or less difficult for the agency to pursue.

The fact that a legislature can use this "decision cost" strategy instead of or in addition to a discretion-limiting strategy is one of the important insights in the classic contributions of McCubbins, Noll and Weingast (1987, 1989).[2] The decision-cost approach has been further developed in important work by, among others, Spiller and Tiller (1997), Tiller (1998), and Spence (1999). More recently, Gailmard (2005) has explored the differences between the decision-cost and discretion-limiting approaches to controlling the bureaucracy and shown that the discretion-limiting approach is only preferable under a limited set of special conditions; otherwise, a decision-cost approach is generally superior. The central insight of this literature is that legislatures and other overseers have an incentive to manipulate agency decision costs in order to align agency policy preferences more closely with the overseer's policy preferences. However, the literature on controlling agencies by manipulating agency

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[2]In a sense, the discretion-limiting approach may be thought of as a special case of the decision-cost approach in which the decision costs of certain actions are set at zero and the decision costs of other actions are set sufficiently high that the agency would never rationally choose those actions under any circumstances. (cf. Gailmard 2005)

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decision costs typically assumes, implicitly or explicitly, that agency expertise is exogenous.

Thus, although there is a small but important body of literature on endogenous agency expertise, and also an important literature on decision-cost strategies for controlling the bureaucracy, the insights of these literatures have not been combined. The existing endogenous expertise literature considers only on discretion-limiting strategies of control, while the literature on decision-cost strategies assumes exogenous agency expertise. This paper contributes to the literature by analyzing how agency expertise might vary with the relative decision costs of different actions, and exploring the implications of this effect for decision-cost strategies of bureaucratic control.

2 The Model

Consider a simple sequential policy-making game with two players, a decision-maker and an overseer. The decision-maker might be thought of as an administrative agency, executive official, or bureaucratic subordinate. The overseer might be thought of as a court, legislature, bureaucratic superior, or independent oversight agency. The decision-maker, which I will refer to as the agency, has been charged with making some binary decision, such as whether or not to ban asbestos, or whether or not to authorize commercial development of a wilderness area. This decision is denoted by $x \in \{0, 1\}$, where $x = 0$ represents the decision to retain the status quo and $x = 1$ represents the decision to take the proposed action.[3]

The proposed action has some net impact, b, which is a random variable drawn from a continuous distribution F with support on $\mathbb{R}$. The density of the distribution is f and the mean is μ. The parameter b may be thought of as a reduced form expression of all the decision-relevant empirical effects associated with the proposed action. In the asbestos example, the b parameter might capture the annual number of cancer cases and other adverse health effects that would be prevented, the economic burden on affected industries and

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[3]The assumption of a binary decision greatly simplifies the exposition. An extension, discussed in Part 4.1, analyzes a case in which the agency can choose from an arbitrarily large set of options. The basic qualitative results of the model do not change.

consumers, and so forth. If lives and dollars were the only relevant considerations, b might be interpreted as a monotonically increasing function of the ratio of statistical lives saved per dollar of economic cost.

The preferences of the agency and the overseer are positively correlated in that, for both of them, the expected payoff of regulation is increasing in b. Though this assumption may not always hold, it is often sensible. For example, in the asbestos case, if b is the ratio of lives saved per dollar spent, it is reasonable to suppose that extreme liberals, extreme conservatives, and everyone in between would agree that high b values are better than low b values (cf. Bueno de Mesquita and Stephenson 2006; Stephenson 2006). The agency and the overseer may nonetheless have substantially different views about when a proposed regulation is cost-justified.

To capture this preference divergence formally, assume that the utility payoff to the agency from the enactment of the proposed regulation is b, while the utility payoff to the overseer from this regulation is $b - s$, where $s \in \mathbb{R}$ measures the degree to which the overseer is more skeptical of, or hostile to, the proposed regulation than is the agency.[4] If $s > 0$, the overseer is more skeptical of regulation than the agency, while if $s < 0$, the overseer is more "zealous" (pro-regulation) than the agency. In the asbestos example, we might say that the s parameter measures how much more conservative the overseer is than the agency, with higher s values indicating greater conservatism. In a different example, though, the ideological connotations of s might differ: If the decision is whether to open a wilderness area to commercial development, greater skepticism toward altering the status quo (a higher s) looks more liberal, while sympathy for the proposed change (a lower s) looks more conservative.

Initially, both the agency and the overseer know the distribution F, but neither knows the true realization of b. The agency, but not the overseer, can attempt to learn b by investing in costly research. Specifically, before the agency chooses x, it chooses a level of expertise $\pi \in [0, 1]$ and pays research cost $c(\pi)$, where $c(0) = 0$, $c(1) = \infty$, $c' > 0$, and

[4]The model assumes, for simplicity, that s is constant and common knowledge.

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$c'' > 0$. The agency's investment in research may also entail some cost to the overseer. For example, although some of the cost to the agency of investing more in research may result from forgone leisure or budgetary slack, at least some of this cost may represent forgone alternative activities that the overseer also values. Therefore, the model assumes that the agency's choice of research cost $c(\pi)$ imposes utility cost $\alpha c(\pi)$ on the overseer. In most cases, it is plausible to suppose that research costs are more onerous for the agency than for the overseer, both because an agency typically places a higher value on its own programs than an overseer would and because some of the research cost to the agency is forgone slack. Therefore, the main analysis will assume that $0 \leq \alpha < 1$.[5]

After choosing π, the agency either learns the true value of b (with probability π), or else learns nothing (with probability $1-\pi$). Following the approach of Aghion and Tirole (1997), this information structure is modeled by assuming that the agency observes a private signal σ,[6] where:

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\sigma = \begin{cases} b & \text{with probability } \pi; \\ \emptyset & \text{with probability } 1 - \pi. \end{cases}
$$

The overseer does not observe π, c, or σ. That is, the analysis assumes that the overseer cannot observe directly the agency's information nor its level of expertise. Though the agency could attempt to reveal its information to the overseer, this information may not be verifiable, and the agency will typically have an incentive to misrepresent. While a more complete model of overseer-agency interactions might include mechanisms that facilitate the

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[5] A subsequent extension, discussed in Part 4.2, considers the possibility that $\alpha \geq 1$.

[6] As in Aghion and Tirole (1997), the only effect of the research investment c is to increase the probability that the agency learns the true value of b. Agency research may have other effects, however. For example, investment in research may lead the agency to discover alternative ways to design the regulatory intervention that achieve higher benefits at lower cost. In other words, research might increase b. One simple way to model this would be to assume that the payoff of regulation is higher when the agency is informed than when it is ignorant. That formulation is entirely consistent with the model presented in this paper: One need only redefine F as the distribution of b conditional on $\sigma = b$ and redefine μ as the expected value of b conditional on $\sigma = \emptyset$. It would, of course, also be possible to model other relationships between agency research spending and the regulatory payoffs (cf. Bueno de Mesquita and Stephenson 2006), but I do not pursue those possibilities here.

credible transmission of information, such mechanisms are often imperfect. Therefore, the analysis developed here focuses on tools that the overseer might use to influence agency behavior when the agency's expertise and information are unverifiable.

The overseer's main policy instrument in this model is its power to make the agency's decision to adopt a new regulation more or less costly relative to a decision to retain the status quo. For example, the overseer might mandate that, before the agency adopts a new regulation, it must comply with onerous procedures or build an elaborate record defending its decision. Alternatively, the overseer might make the decision to initiate new regulation less costly relative to the status quo, perhaps by threatening political retaliation for inaction or by imposing a statutory presumption that action is necessary (e.g., a "hammer" provision) and requiring the agency to comply with burdensome requirements in order to justify inaction. The model captures this power by allowing the overseer at the beginning of the game to select an enactment cost $k \in \mathbb{R}$, which the agency incurs if it decides to adopt a new regulation rather than to retain the status quo.[7] The agency observes k before deciding how much expertise to acquire.[8]

To summarize, the order of play is as follows:

- Step 0: Nature chooses regulatory benefit b from distribution F;

- Step 1: The overseer chooses enactment cost k;

- Step 2: The agency chooses level of expertise π;

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[7]Note that this framework allows the overseer to make the policy decision itself, rather than delegating this decision to the agency, by selecting $k = \infty$ or $-\infty$.

[8]It is important to highlight two characteristics of enactment costs in this model. First, in contrast to related models of bureaucratic oversight (cf. Gailmard 2005), in this model enactment costs or subsidies do not affect the overseer's utility directly. So, it would be inapt to think of enactment costs in this model as transfers. Rather, they are better thought of as levers the overseer can manipulate to make the agency's life easier or harder under different conditions. The imposition of procedural or explanatory requirements would probably be consistent with this assumption, but a change in the agency's budget probably would not be. Second, the model assumes that the overseer can credibly commit to k at the beginning of the game, and can commit not to overturn the agency's decision after the agency has acted. The credible commitment assumption, though strong, may be substantively plausible in some circumstances. It also establishes a baseline case against which other cases, involving imperfect or no credible commitment, such as those explored in Callander (2006) and Stephenson (2006), might be compared.

- Step 3: After observing signal σ, the agency chooses action x, and both players receive their final utility payoffs.

The final utility payoffs to the agency and the overseer are, respectively:

$$U_A = x(b - k) - c(\pi); \text{ and}$$

$$U_O = x(b - s) - \alpha c(\pi).$$

3 Results

3.1 The Effect of Enactment Costs on Agency Expertise

The first question to address is how marginal changes in enactment cost k affect the agency's equilibrium level of expertise, π^*. The answer to this question is given by the following proposition:

Proposition 1 *When an uninformed agency would regulate (that is, when $\mu > k$), equilibrium agency expertise π^* is increasing in the enactment cost k. When an uninformed agency would choose not to regulate (that is, when $\mu < k$), π^* is decreasing in k. Agency expertise is maximized when $k = \mu$. This is equivalent to stating that π^* is decreasing in $|\mu - k|$, the absolute value of the difference between the enactment cost and the proposed regulation's* ex ante *expected benefit.*[9]

The intuition behind this result is straightforward and grounded in well-known principles of statistical decision theory (Raiffa 1997; Raiffa and Schlaifer 1961). Additional information is valuable to the agency only if it causes the agency to do something different from what it would have done had it remained uninformed. Information is therefore most valuable when the agency is most uncertain *ex ante* as to its best course of action (i.e., when $\mu - k = 0$). If

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[9]All proofs are in the Appendix.

the agency starts out thinking that the benefits of regulation are likely very high relative to the enactment cost ($\mu >> k$), then the agency's investment in research will only improve its payoff if the agency discovers that the benefit of the regulation is actually much lower than expected. But the agency considers this possibility unlikely *ex ante*. Similarly, if an agency starts out believing the benefits of regulation, net of enactment costs, are very negative ($\mu << k$), then investing in research helps the agency only in the unlikely event that the true payoff of regulation turns out to be much higher than expected. When the expected net benefit of regulation is close to zero, however, the potential gains from additional information are large: In this case there is a substantial probability that new information will reveal to the agency that its initial hunch about the best course of action turned out to be wrong.[10]

The crucial substantive point that follows from Proposition 1 is that the effect on agency expertise of marginal changes in the enactment cost depends crucially on what the agency would do if it remains ignorant, i.e. if it observes $\sigma = \emptyset$. In the case where the ignorant agency would regulate (that is, when $\mu > k$), increases in k reduce the distance between μ and k. This increases the expected value of additional information, and so increases the agency's investment in expertise. On the other hand, when an ignorant agency would retain the status quo (that is, when $\mu < k$), increasing k increases the distance between μ and k, thereby reducing the expected value of additional information and reducing agency expertise.[11]

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[10]The exposition in the text is oversimplified. Specifically, there may be cases when the *expected value* of additional information is low even though the *probability* that the uninformed agency's guess was incorrect is relatively high. For example, suppose there is a small probability that b is very high, but a large probability that b is just slightly below zero. In this case, the expected value of the new regulation is positive, so the uninformed agency would regulate, but the probability that the informed agency would learn that it should actually retain the status quo is high. In this case, though, increasing the enactment cost would still induce the agency to invest more in expertise.

[11]In the case where $k = \mu$, the ignorant agency is indifferent between regulation and the status quo, and so could choose to regulate with any probability, the choice of which would be arbitrary and would not affect the expected payoffs of either player.

3.2 The Overseer's Optimal Enactment Costs

The next question concerns the optimal enactment cost from the overseer's perspective.[12] The enactment cost affects the overseer's utility in two ways. First, an enactment cost (or subsidy) may improve the overseer's utility by bringing the agency's policy preferences into closer alignment with the overseer's. In this way, the overseer can get the agency to make choices that more closely track the choices the overseer itself would have made if it had the same information as the agency. This use of enactment costs is consistent with the perspective of most of the existing literature on the manipulation of decision costs as a technique of political control (Spiller and Tiller 1997; Tiller 1998). If preference alignment were the overseer's only concern, its optimal k, denoted k^*, would be equal to s.

However, Proposition 1 demonstrates that the enactment cost can have a second effect on the overseer's utility. Changes in enactment costs can increase or decrease the agency's expertise, and the overseer benefits from higher levels of agency expertise because greater expertise reduces the number of cases in which an uninformed agency makes a decision that the agency and the overseer would both consider an error. Furthermore, the overseer does not bear the full costs associated with increasing agency expertise (because of the assumption that $\alpha < 1$). Hence, even if the overseer and the agency have identical policy preferences, the overseer would prefer the agency to invest more in expertise than the agency would like.

The problem for the overseer is that, except in the special case where $s = \mu$, the overseer's interest in eliminating agency bias and its interest in increasing agency expertise will conflict. The overseer's optimal choice of k^* will reflect these competing interests, as characterized in the following proposition:

Proposition 2 *The overseer's preferred enactment cost, k^*, lies between s (the degree to which the overseer is more skeptical of regulation than the agency) and μ (the expected benefit of regulation to the ignorant agency). That is:*

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[12]It is important to emphasize that the overseer's optimal enactment cost need not be *socially* optimal. Under some circumstances the preferences of a particular overseer might approximate social preferences, but under other circumstances they may not (cf. Bueno de Mesquita and Stephenson 2006).

- $s = \mu \Rightarrow k^* = s = \mu;$

- $s > \mu \Rightarrow s > k^* \geq \mu;$

- $s < \mu \Rightarrow s < k^* \leq \mu.$

This Proposition states that, when agency expertise is endogenous and research costs are more significant to the agency than to the overseer, then the optimal enactment cost, from the overseer's perspective, will not be equal to s. Rather, this optimal enactment cost, k^*, will lie between s and μ.[13]

This result contrasts with the predictions of decision-cost analyses that presume exogenous expertise. As noted earlier, if agency expertise were exogenous, then the overseer's optimal k^* would be equal to s. Qualitatively, this means that if the overseer is more skeptical of regulation than the agency, the overseer would prefer a positive enactment cost, while if the overseer is more zealous than the agency (that is, more sympathetic to the proposed regulation), the overseer will prefer a negative enactment cost (a status quo cost or enactment subsidy). Furthermore, the magnitude of this enactment cost or subsidy should correspond as closely as possible to the size of the ideological distance between the agency and the overseer. If the overseer and the agency have the same policy preferences, though, then the overseer would prefer not to impose any enactment cost or subsidy.[14]

Proposition 2 indicates how these results change if agency expertise is endogenous. First, the overseer will generally prefer a nonzero enactment cost even when the overseer and the agency have *identical* policy preferences ($s = 0$). If the agency and the overseer are both equally zealous *ex ante* (that is, if $\mu > s = 0$), the overseer will prefer a positive enactment

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[13]Note that although k^* will never be equal to s, it is possible that k^* might be equal to μ. The reason for this is that, although enactment cost $k = \mu$ maximizes the agency's investment in expertise, this expertise level is not the optimal level for the overseer. The overseer would prefer an even higher level of expertise; however, this is not achievable. Although π is maximized at $k = \mu$, the derivative $\frac{d\pi}{dk}$ is not zero at this point. Rather, the derivative is undefined. Hence, it is possible that, for some distributions and cost functions, any deviation from $k = \mu$ will reduce the overseer's utility because the effect on expertise will outweigh the utility gain associated with closer alignment of agency policy preferences.

[14]These claims are related to the hypothesis known as the "ally principle," which posits that a principal will confer more discretion on an agent with preferences similar to the principal's own (Bendor and Meirowitz 2004).

cost, while if they are both equally skeptical *ex ante* ($\mu < s = 0$), the overseer will prefer an enactment subsidy. The reason is that the overseer and the agency disagree over how much the agency should invest in information. This disagreement arises because the agency incurs more of the costs associated with higher levels of expertise than does the overseer.

What about circumstances in which the agency and the overseer have divergent policy preferences ($s \neq 0$)? There are several cases to consider. Suppose first that the agency and the overseer are both zealous, but the agency is more zealous than the overseer ($\mu > s > 0$). In this case, the overseer will prefer a positive enactment cost, as conventional decision-cost theory would predict. But, the optimal enactment cost will be *greater* than s: The endogeneity of expertise leads the overseer to prefer more substantial enactment costs than would be optimal if agency expertise were exogenous because, as Proposition 1 teaches us, a higher k will induce the agency to increase expertise (but this is so only as long as $\mu > k$). Similarly, if both the agency and the overseer are skeptical, but the agency is more skeptical than the overseer ($\mu < s < 0$), then the overseer will prefer an enactment subsidy that is larger (i.e., a k^* that is more negative) than what conventional decision cost theory would predict.

The next case to consider is one in which the agency is zealous, but the overseer is skeptical ($s > \mu > 0$). In this case, the overseer will prefer a positive enactment cost, but a cost that is *smaller* than what would be needed to align the agency's policy preferences with those of the overseer. In other words, the overseer would prefer an enactment cost that appears insufficiently large if the endogeneity of agency expertise is ignored. In this case, as Proposition 1 indicates, reducing k will increase agency expertise (as long as $k > \mu$). Likewise, in the case where the agency is skeptical and the overseer is zealous ($s < \mu < 0$), the overseer prefers an enactment subsidy, but one that is too small to bring the policy preferences of the agency and overseer into alignment.

Finally, suppose that the agency and the overseer are both zealous, but the overseer is more zealous than the agency ($\mu > 0 > s$). If agency expertise were exogenous, the overseer

Preferences of Agency (A) and Overseer (O)	Optimal Enactment Cost/Subsidy with Exogenous *Expertise*	Optimal Enactment Cost/Subsidy with Endogenous *Expertise*
A and O are equally zealous $(\mu > s = 0)$	None $(k^* = 0)$	Cost $(k^* > 0)$
A and O are equally skeptical $(\mu < s = 0)$	None $(k^* = 0)$	Subsidy $(k^* < 0)$
A and O are both zealous, but A is more zealous $(\mu > s > 0)$	Cost equal to s $(k^* = s)$	Cost *larger* than s $(k^* > s)$
A is zealous, but O is skeptical $(s > \mu > 0)$	Cost equal to s $(k^* = s)$	Cost *smaller* than s $(k^* < s)$
A and O are both skeptical, but O is more skeptical $(s > 0 > \mu)$	Cost equal to s $(k^* = s)$	Cost *or* subsidy possible $(k^* < s)$
A and O are both skeptical, but A is more skeptical $(\mu < s < 0)$	Subsidy equal to $|s|$ $(k^* = s)$	Subsidy *larger* than $|s|$ $(k^* < s)$
A is skeptical, but O is zealous $(s < \mu < 0)$	Subsidy equal to $|s|$ $(k^* = s)$	Subsidy *smaller* than $|s|$ $(k^* > s)$
A and O are both zealous, but O is more zealous $(\mu > 0 > s)$	Subsidy equal to $|s|$ $(k^* = s)$	Cost *or* subsidy possible $(k^* > s)$

Figure 1: Comparison of Overseer's Optimal Enactment Costs: Exogenous v. Endogenous Agency Expertise

would prefer an enactment subsidy (in particular, a subsidy $k^* = s < 0$). But if agency expertise is endogenous, the overseer prefers a higher k. Accordingly, we can no longer be certain even of the sign on k^*. It is possible that in this case the overseer would prefer an enactment cost rather than an enactment subsidy, even though the overseer is more zealous than the agency. A similar logic applies to the case where the agency and the overseer are both skeptical, but the overseer is more skeptical than the agency $(s > 0 > \mu)$. If agency expertise were exogenous, the overseer would prefer an enactment cost $k^* = s > 0$, but when expertise is endogenous the preferred enactment cost will be smaller than s, and may even be negative.

These comparative statics results are summarized in Figure 1.

4 Extensions

4.1 Multiple Regulatory Options

The preceding analysis assumed, for simplicity, that the agency has a binary choice between enacting a particular regulatory policy and retaining the status quo. That framework is relatively easy to analyze and explain, and so is useful in conveying the intuition of the model's main results. The assumption of a binary choice between a specific new policy and the status quo may also capture the reality of many types of agency decisions. However, this assumption is open to the criticism that agencies often choose from a larger menu of policy options. The EPA may not necessarily have to decide between banning asbestos and retaining the status quo; it might instead be able to adopt alternative approaches, such as a partial ban or temporary moratorium, expanded use of warning labels, and the like. In other cases, the regulatory choice is most naturally thought of as continuous rather than discrete, as when the EPA selects a permissible exposure level, expressed in parts per million, for a given toxic substance. It is therefore worth asking how important the dichotomous choice restriction is to the model's substantive conclusions.

Though extending the model to incorporate multiple regulatory options introduces some additional complications, the basic qualitative results are unchanged: When expertise is endogenous, increasing the enactment cost associated with the option(s) that the uninformed agency would choose will increase agency expertise. In contrast, increasing the enactment cost associated with any other regulatory option will decrease agency expertise. Additionally, because the enactment cost affects both agency policy preferences and agency expertise, the overseer's optimal enactment cost schedule will have to balance these considerations. The optimal enactment costs will therefore differ from what one would expect to observe if expertise were exogenous.

To see this, assume that the agency, instead of choosing a policy $x \in \{0, 1\}$, chooses a

policy $x \in \mathbf{X}$, where $\mathbf{X}$ is a set that contains $n+1$ elements indexed by i.[15] Arbitrarily, we can designate 0 as the status quo policy, and $i = 1 \ldots n$ as the set of regulatory alternatives to the status quo. The payoff to the agency of adopting any given i is $y_i(b)$, while the payoff to the overseer is $y_i(b) - s_i$, where the set of s_i values captures the preference divergence between the agency and the overseer.[16] At the beginning of the game, the overseer commits to a schedule of k_i values such that the agency's final utility payoff is $y_i(b) - k_i - c(\pi)$. Otherwise, the model is identical to the earlier set-up.[17]

Designate $\mathbf{m}$ as the subset of i values that maximize $\int (y_i(b) - k_i) f(b) db$ for any given distribution F and schedule of k_i values. In other words, $\mathbf{m}$ is the set of policies from which the agency would choose if it remains uninformed.[18] If the agency observes b, it will choose whichever i maximizes $y_i(b) - k_i$.

As before, the relevant questions are, first, how changes in the k_i values affect the agency's incentive to acquire information about b, and, second, what the overseer's optimal schedule of k_i values looks like. Although this multiple-option model is more complex, the main results of the earlier analysis do not change.

First, the agency's incentive to acquire expertise is strongest when the uninformed agency is least confident regarding its best course of action. This basic intuition is formalized in the following proposition, which is simply a slight modification and generalization of Proposition 1:

Proposition 3 *The agency's preferred level of expertise, π^*, is increasing in k_i if $i \in \mathbf{m}$ and decreasing in k_i if $i \notin \mathbf{m}$.*

Substantively, this means that increasing the enactment cost of the uninformed agency's

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[15]Although this is still a discrete-choice framework, one can approximate the continuous-choice case by making n arbitrarily large.

[16]Note that the s_i values are not constrained to be identical. As before, however, I make the simplifying assumptions that the s_i values are constant and common knowledge.

[17]Notice that the dichotomous choice model is simply a special case of this more general model, where $n = 1$, $y_1(b) = b$, and the values of $y_0(b)$, s_0, and k_0 are all normalized to zero.

[18]If $\mathbf{m}$ contains only one element, then that is the specific policy the uninformed agency would choose. If $\mathbf{m}$ contains more than one element, the agency could simply select one of these policies at random.

most preferred option(s), relative to the other options available, will increase agency expertise. These *relative* enactment costs may increase either because enactment cost $k_{i \in \mathbf{m}}$ increases or because some other enactment cost $k_{i \notin \mathbf{m}}$ decreases.[19] Agency expertise is maximized when the k_i values are such that all policy choices give the ignorant agency the same expected utility, i.e. when $\mathbf{m}$ contains every value of i. Qualitatively, we can say that in this case, as in the dichotomous case, the central insight is that using decision costs to make the agency more uncertain *ex ante* will increase the amount the agency invests in expertise.

What about the overseer's optimal schedule of enactment costs? As before, if agency expertise were exogenous, then the overseer would prefer a k_i schedule that aligns the agency's policy preferences with the overseer's. This can be done straightforwardly by setting $k_i = s_i$ for all i. But, if expertise is endogenous, then this k_i schedule will no longer be optimal, except in the special case where the values of $\int (y_i(b) - s_i) f(b) db$ are equal for all i. Rather, the overseer's optimal k_i for each i must be selected to balance both the effect of k_i on the agency's ultimate choice of policy (which pulls k_i in the direction of s_i) and the effect of k_i on agency expertise (which pulls k_i in the direction indicated by Proposition 3).[20]

Because the binary discrete-choice case is easier to describe and analyze, most of the remaining discussion will focus on this case. This extension, however, has shown that the model's intuition and main results also hold, with appropriate modifications, in the multiple-option case.

4.2   Overseer Bears Equal or Higher Research Costs

The basic model assumed that $\alpha < 1$, on the logic that the agency would place a greater weight on the costs associated with acquiring expertise than would the overseer. This as-

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[19]Of course, changes in the relative enactment costs of different options will change the i's that are in set $\mathbf{m}$. One obvious ramification of this is that if there is more than one policy in $\mathbf{m}$, then increasing the enactment costs for only a subset of these policies will *not* increase agency expertise, because those policies would no longer in $\mathbf{m}$. Expertise will increase only if the enactment costs of *all* policies in $\mathbf{m}$ increase together, such that all these policies remain in $\mathbf{m}$.

[20]Because fully characterizing the optimal k_i schedule in the multiple-option case would involve significant complexity without significant additional insights, I omit a formal proposition and proof.

sumption seems plausible in most circumstances, for two reasons. First, at least some of the cost of agency effort, from the agency's perspective, is forgone slack. Slack—in the form of leisure or perks—is valuable to the agency but not to the overseer. Second, even if some of the costs of research effort are opportunity costs—e.g., the diversion of resources away from other agency tasks—the agency may view these opportunity costs as more substantial than the overseer does. This would follow if agencies tend to value their own projects and missions more highly than outsiders do.

Nonetheless, there may be circumstances when the significance of agency research costs to the overseer is equal or greater to the significance of those costs to the agency. That is, it may be possible that $\alpha \geq 1$. Suppose, for example, that increasing agency research on the effects of a new proposed regulation diverts agency resources away from enforcement of existing regulations. Suppose further that the current agency head cares a great deal about the success or failure of the proposed regulation, perhaps because of the impact on her future career. In this case, the agency head may place less (relative) value on the enforcement of existing regulations than does the overseer. Research costs, in the form of forgone enforcement, may be a bigger concern to the overseer than to the agency in this case, which could justify an $\alpha \geq 1$.

The predictions of the model regarding the overseer's optimal enactment cost change substantially if $\alpha = 1$ or $\alpha > 1$, as established by the following two propositions.

Proposition 4 *When $\alpha = 1$, $k^* = s$.*

That is, when the overseer and the agency value research costs equally, the overseer behaves as if expertise were exogenous. Proposition 4 underscores the important fact that the effect of endogenous expertise on the overseer's optimal enactment costs depends crucially on the assumption that the overseer does not internalize all the agency's research costs. If the overseer and the agency place the same relative weight on research costs, then the overseer's optimal enactment cost will reflect only the interest in aligning agency preferences, not any interest in altering the agency's investment in expertise. So, in the case where $\alpha = 1$, even

though the agency's expertise may be endogenous, the overseer behaves in exactly the same way it would if expertise were exogenous.

Proposition 5 *When $\alpha > 1$, k^* lies outside of the range between s and μ. That is:*

- $s = \mu \Rightarrow k^* \neq s = \mu$

- $s > \mu \Rightarrow k^* > s \text{ or } k^* < \mu$

- $s < \mu \Rightarrow k^* < s \text{ or } k^* > \mu$

Proposition 5 may appear counterintuitive or difficult to interpret. The basic qualitative result is that, for the case where $\alpha > 1$, the prediction of Proposition 2 is inverted. Instead of expecting to find k^* *inside* the range between s and μ, we should expect to find k^* somewhere *outside* that range. This result arises from the fact that the overseer is concerned that, left to its own devices, the agency will invest too much in acquiring expertise. In contrast to the basic model, where the overseer had an incentive to make the agency *less* certain *ex ante* in order to increase research investment, here the overseer has an incentive to make the agency *more* certain *ex ante* in order to reduce research investment.

The overseer can make the agency more certain by increasing the distance between k and μ. So, if the overseer thinks that the agency is spending too much time thinking about new regulations at the expense of enforcing existing regulations, it can make adopting new regulations either very costly or very attractive. Either strategy reduces the amount the agency will invest in research; which strategy is superior, from the overseer's perspective, depends on the other parameter values. As in the basic model, though, the overseer must balance its interest in altering the agency's expertise investment against the overseer's interest in compensating for the agency's divergent policy preferences.

Though these results are interesting and may have some applicability in certain situations, as a substantive matter the assumption that $\alpha < 1$ appears more plausible than the assumptions that $\alpha = 1$ or that $\alpha > 1$. So, while the extension discussed here highlights

potentially interesting complications of the model's main predictions under these alternative assumptions, the following discussion of substantive implications focuses on the results of the basic model, in which $0 \leq \alpha < 1$.

5 Implications

The formal analysis demonstrates that the predictions regarding overseer preferences, and the influence of enactment costs on agency behavior and regulatory outcomes, may be quite different when agency expertise is endogenous than when it is exogenous. This central insight, and the model's more specific predictions, may have implications for ongoing debates about regulatory oversight and related issues in institutional design and public law.

5.1 Administrative Law and Procedure

Consider the implications of the foregoing analysis for three of the most widely discussed and controversial mechanisms of bureaucratic oversight: "hard look" judicial review of agency decisions, regulatory review by the Office of Management and Budget (OMB), and legislative use of "structure-and-process" control mechanisms.

Judicial Review Under §706 of the Administrative Procedure Act (APA), federal courts are empowered to "hold unlawful and set aside agency action, findings, and conclusions found to be arbitrary, capricious, [or] an abuse of discretion." Courts have interpreted the "arbitrary and capricious" standard to require that an agency demonstrate that it has "examine[d] the relevant data and articulate[d] a satisfactory explanation for its action, including a rational connection between the facts found and the choice made." (State Farm v. Motor Vehicles Manufacturers' Association [463 U.S. 29 (1983)]). This approach is typically referred to as "hard look" judicial review.

Scholars dispute whether hard look review is effective in providing courts with useful information or filtering out unreasonable agency decisions (McGarity 1992; Seidenfeld 1997).

One clear effect of hard look review, though, is to make certain actions—usually decisions to alter the status quo[21]—more costly. Critics charge that this leads to the "ossification" of agency rulemaking, deterring socially desirable regulation (McGarity 1992; Pierce 1995). Defenders of hard look review typically argue that the ossification problem is overstated and outweighed by the benefits of hard look review (Jordan 2000; Seidenfeld 1997). Others have suggested an upside to ossification: The costs associated with hard look review may ensure that agencies only pursue policies with sufficiently large benefits (Stephenson 2006).

In the language of the model, hard look review imposes enactment costs on decisions to change the status quo. Courts can manipulate these costs by subjecting certain kinds of agency decisions to greater or lesser scrutiny under the hard look standard. Though in theory the standard is supposed to apply evenhandedly, in practice many observers would agree that "whether the court will dig deeply or bow cursorily depends . . . on whether the judge agrees with the result of the administrative decision" (Rodgers 1981). Social scientists have formalized this intuition and shown how courts can induce agencies to pursue policies that more closely track the courts' regulatory preferences by manipulating agency decision costs in this way (Tiller 1998; Stephenson 2006). Empirical evidence on judicial decision-making, though hardly conclusive, generally supports the view that judges practice "selective deference" in applying the hard look standard (Revesz 1997; Tiller 1998). Furthermore, Congress may also influence the stringency of hard look review. For instance, while most agency rulemakings are governed by the APA's default "arbitrary and capricious" standard, under some statutes, such as the Occupational Safety and Health Act, certain rules must satisfy the more stringent "substantial evidence" standard.

How might our understanding of hard look review change if we consider the possibility that agency expertise might be endogenous? First, the prediction that courts or legislatures will try to use the stringency of hard look review to bring agency policy preferences into

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[21]This is not necessarily the same as the decision to impose new regulatory requirements. For example, in *State Farm*, the leading Supreme Court case on hard look review, the agency action under review was a decision to eliminate a regulatory requirement that the agency had adopted in an earlier proceeding.

line their own must be qualified along the lines indicated by Proposition 2 and illustrated in Figure 1. While agency expertise may not be valuable to courts in and of itself, higher levels of agency expertise increase the judiciary's utility indirectly if agency and judicial preferences are positively correlated. The court's interest in increasing the agency's expertise will cause the court's optimal level of stringency to diverge from what one would predict if the court's only concern were influencing the agency's policy preferences.

Second, the model suggests a mechanism by which hard look judicial review might affect agency expertise that is different from the mechanisms discussed in the existing literature. Proponents of aggressive hard look review have argued that it increases agency expertise because agencies must demonstrate such expertise in order to survive judicial scrutiny (Seidenfeld 1997; Sunstein 1984). Critics, on the other hand, have asserted that hard look review reduces agency expertise because it causes agencies to divert resources away from activities that enhance expertise, such as technical research, and toward those that do not, such as lawyer-dominated *post hoc* record building (Pierce 1995; Shapiro 1988). The model developed here does not engage these competing claims directly, because it does not incorporate the possibility that enactment costs may be a function of the agency's expertise or information.[22] Nonetheless, because the model demonstrates that enactment costs *qua* costs can affect agency expertise, it has implications for this debate.

Suppose, for example, that neither the critics nor the defenders of hard look review are correct in their arguments as to how hard look review affects agency expertise. That is, suppose that the amount the agency invests in expertise neither increases nor decreases the cost to the agency of producing a record sufficient to survive judicial review. Does this mean that the stringency of such review will have no effect on agency expertise? The model

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[22]This assumption is made not for substantive reasons, but rather to simplify the exposition. A useful extension of the model might incorporate the possibility that enactment costs are affected by investment in expertise (i.e., that k is a function of π) or that enactment costs are a function of the agency's private information (i.e., that k is a function of σ). Intuitively, it appears likely that, compared to the baseline model developed in this paper, the agency's expertise would be higher if enactment costs are negatively correlated with the agency's expertise or the accuracy of its private information, and lower if if enactment costs are positively correlated with these things, but that the other results of the model would be qualitatively the same. However, I defer full consideration of this possibility to future research.

indicates that the answer is no. If the ignorant agency would be inclined to regulate, then more stringent hard look review will increase agency expertise even if courts are not able to distinguish between informed and uninformed agencies. On the other hand, if the ignorant agency would retain the status quo, then more stringent hard look review will decrease agency expertise, even if devoting resources to defending regulation in court does not itself erode the agency's technical capabilities.

We can push the point further. Suppose that the hard look defenders are correct that it is easier for an agency to survive judicial review if the agency really knows what it is talking about. Even so, hard look review may still entail enactment costs that are independent of the agency's expertise. If this is correct, then in the case where the ignorant agency would regulate, hard look review has two countervailing effects on agency expertise. On one hand, investment in research makes it easier to survive judicial review, which increases the agency's incentive to acquire expertise. On the other hand, though, the enactment costs associated with hard look review will decrease the agency's incentive to acquire expertise. Without more specific information, it is impossible to say which of these effects will predominate, and arguments that consider only one of these effects may be incomplete and misleading.

Alternatively, suppose the critics are correct that the activities an agency must engage in to survive hard look review not only do not increase agency expertise, but divert resources from activities that do. Even under this assumption, it is not necessarily the case that more stringent hard look review reduces agency expertise. If an ignorant agency would be wiling to regulate, and if hard look review increases enactment costs, then the model shows that more stringent review can increase the agency's incentive to acquire expertise. This effect may or may not be stronger than the decrease in the agency's expertise created by the shift of resources from technical research to lawyer-dominated record building.

OMB Review Courts are not the only oversight body that may subject agency regulations to a "hard look." Under executive orders promulgated by Presidents Reagan and Clinton, agencies must submit proposals for major federal regulation to OMB's Office of Informa-

tion and Regulatory Affairs (OIRA) for review and consultation. Though OIRA cannot formally veto a regulatory proposal, OIRA review can significantly delay or derail regulatory initiatives. Defenders of OIRA oversight argue that it improves the quality of regulation, correcting for agency tunnel vision, overzealousness, or other failings (DeMuth and Ginsburg 1986; Seidenfeld 2001). Critics have argued that OIRA's ability to impose delays and to require additional justification for regulatory proposals creates a regulatory "black hole" that swallows up many worthwhile initiatives, often for political reasons but sometimes as an unintended effect of the overly cumbersome review process (McGarity 1992; Morrison 1986). While a great deal could be said about the pros and cons of OIRA review, for purposes of the present analysis the salient question is how it might affect an agency's incentives to invest in expertise. Like judicial review, OIRA review may sometimes be effective in identifying cases where the policymaking agency did or did not have relevant information, but it also imposes enactment costs. It is therefore sensible to ask how the existence of these costs might affect the agency's expertise, independent of the substantive efficacy of OIRA review.

Because the analogy between judicial review and OIRA review is so close, it is unnecessary to belabor the model's predictions for the effects of changes in the enactment costs associated with OIRA review.[23] It is worth briefly restating and highlighting two of these results, however. First, if an uninformed agency would be inclined to regulate, then the costs and delays associated with the OIRA process can improve agency expertise even if the review process does nothing directly to improve the quality of the regulation. As a result, OIRA may prefer to impose costs and delays even if it has exactly the same policy preferences as the agency. Indeed, OIRA may sometimes want to make the enactment of regulation costly even if OIRA is *more* enthusiastic about the proposed regulation than is the agency.

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[23]This is not to say that there are not important differences between OIRA review and judicial review. There are. OIRA review, for example, is supposed to be ongoing, rather than strictly *ex post*, though many observers have criticized the existing system precisely because OIRA gets involved too late in the process (Elliott 1994). OIRA also emphasizes cost-benefit analysis of regulation, and it may be better at observing whether an agency is or is not informed. While I acknowledge these differences, it is probably still the case that OIRA review also imposes simple *ex post* enactment costs of the sort I model, and the analysis in this section is restricted to considering the impact of those costs on agency expertise. In that sense, OIRA review and judicial review are similar.

Second, if an uninformed agency would not regulate, then OIRA review costs will reduce the agency's expertise. So, even if the defenders of OIRA review are correct that it improves agency expertise by forcing the agency to produce more high-quality studies of a proposed regulation's effects, the enactment costs that OIRA review imposes can sometimes generate a countervailing effect. Without more information, one cannot determine which of these effects will predominate, and hence one cannot determine whether more stringent OIRA review will meet its goal of increasing agency expertise.

"Structure-and-Process" Control of Agency Decision-Making The model developed here does not apply directly to many of the most widely discussed forms of legislative oversight of the bureaucracy, such as budgetary control (Carpenter 1996; Ting 2001) or the threat of statutory override (Cameron and Rosendorff 1993; Ferejohn and Shipan 1990). That said, the model may apply to a subset of so-called structure-and-process techniques for extending legislative influence over bureaucratic policymaking (McCubbins, Noll and Weingast 1987, 1989). While the structure-and-process category includes a wide variety of control mechanisms, certain of these mechanisms operate primarily by manipulating an agency's decision costs, making some courses of action relatively more or less costly by altering procedural requirements. Empirical research has suggested that these forms of structure-and-process control may be among the most effective and important. Spence (1999), for example, finds in the context of federal hydroelectric licensing decisions that "those procedures that were specifically tailored to increase the transaction costs of a particular decision . . . were more effective than more general, facially neutral procedures." The model directly applies to this form of legislative control over bureaucratic policy.

As noted earlier, most of the existing literature on structure-and-process control mechanisms assumes that Congress would prefer to impose decision costs that eliminate agency "bias" or "drift," aligning agency policy preferences with those of the legislature (Bendor, Taylor and Van Gaalen 1987; McCubbins, Noll and Weingast 1987, 1989; Spiller and Tiller 1997). To avoid repetition, I will not restate the model's main conclusions in this context, ex-

cept to point out that if the model captures something important about the impact of these mechanisms on Congress's utility, then congressional incentives regarding the appropriate design of structure-and-process mechanisms may differ systematically from the predictions of the conventional theory. If that is true, then the model both suggests new avenues for theoretical and empirical research on structure-and-process control, and also suggests that many of the existing empirical tests of the structure and process hypothesis may be misspecified.

5.2 Other Public Law Applications

Though the analysis so far has focused on delegation and oversight in the context of regulatory policymaking, the model's basic insight is relevant in other contexts in which a decision-maker can acquire expertise by engaging in costly effort, while a relatively uninformed overseer has the power to influence the decision-maker's choices by making certain decisions relatively more or less costly. In this section, I discuss how the model might apply in three other public law contexts: congressional and judicial oversight of executive decision-making on national security issues; magistrate screening of police search warrant applications; and judicial review of the constitutionality of legislative enactments.

National Security Debates involving the tension between the importance of executive branch expertise and the perceived need for judicial and legislative oversight have recently assumed particular salience in the context of national security. To what extent should executive decisions regarding national security—whether to undertake military action, employ coercive interrogation techniques, authorize wiretaps, and the like—be subject to procedural safeguards or other forms of congressional or judicial oversight? Many have argued that oversight of executive decisions is essential to preserving meaningful checks and balances and to preventing abuses of power (Cole 2003, 2004). Others have countered that because the executive has greater expertise and access to relevant information, and must often act quickly and decisively in times of war or emergency, burdensome procedures or intrusive oversight can endanger national security (Posner and Vermeule 2003, 2005; Sunstein 2005). This set

of questions obviously involves myriad political, legal, and moral concerns well beyond the scope of this paper. That said, the analysis presented here may shed light on one important aspect of this problem that has received comparatively little attention: the effect of burdensome oversight mechanisms on the executive's expertise regarding the national security implications of different courses of action.

As a stylized illustrative example, consider the question whether the executive may authorize the use of otherwise impermissible coercive interrogation techniques against suspected terrorists or terrorist sympathizers. Before the responsible official decides whether to authorize such tactics, she may attempt to acquire additional information about the extent of a particular suspect's likely knowledge of terrorist activities. This pre-interrogation investigation is costly, however, and it may or may not uncover additional useful information. How does the incentive to pursue pre-interrogation investigation change as the decision to use coercive techniques becomes more costly for the responsible executive official? This question is important because the cost of going ahead with the coercive interrogation (the "enactment cost" in the langauge of the model) may increase if external actors, such as Congress or the courts, impose more procedural or substantive requirements on the decision to employ coercion.

The model demonstrates that the impact of burdensome oversight on executive expertise depends on what the executive would do if attempts to acquire more pre-interrogation information are unsuccessful. If the responsible official would not use coercive interrogation if she fails to uncover additional information indicating that the suspect has information critical to national security, then procedural requirements that make coercive interrogation more costly to the executive will decrease pre-interrogation investigation. As a result, a rational overseer might prefer to refrain from imposing burdensome procedures, and might even prefer to make coercive interrogation a relatively more desirable option. This may be the case even if the overseer is even more strongly predisposed against coercive interrogation than is the executive.

On the other hand, though, consider the alternative case in which the responsible official would go ahead with a coercive interrogation absent additional concrete information about the suspect's likely knowledge of terrorist threats. In this case, increasing the procedural burdens associated with authorizing coercion will increase the official's investment in pre-interrogation investigation. This prediction implies that a legislative or judicial overseer might prefer to impose such burdens—even if the overseer and the executive official have *exactly* the same views on the circumstances under which coercive interrogation is justified. In other words, the case for some degree of burdensome procedural oversight does not depend on the belief that the executive has the wrong policy preferences, e.g. that it cares too little about civil liberties. In some circumstances, as the example above illustrates, burdensome oversight may be appropriate because the executive might otherwise invest too little in information, even though the executive has the right policy preferences.

Criminal Investigations The same basic argument applies to more garden-variety forms of criminal law enforcement as well. Consider, as another example consistent with the model, police applications for search warrants. Police officers are likely to be better informed, relative to the magistrate judges who review warrant applications, as to whether a search is justified. But, magistrates may lack the expertise to evaluate the information contained in warrant applications, and in practice warrant applications are rarely denied. Even if substantive review of warrant applications is minimal, however, the application process itself can affect police officers' behavior by making the acquisition of a warrant more costly to police, and this can screen out searches the police view as low value *ex ante* (Dripps 1986; Stephenson 2006; Stuntz 2002). If police officers' expertise—their probability of learning additional information about the likely benefits of a given search—is exogenous, then the rational thing for magistrate judges or legislatures to do is to set application costs (equivalent, in this case, to enactment costs) such that the preferences of the police are aligned with those of the relevant overseer. For example, if the legislature believes the police are too eager to search in marginal cases, the optimal solution would be to impose an application cost high enough

to eliminate this pro-search bias.

But officers usually can learn more about the likely value of a particular search only by investing scarce resources in pre-search investigation. If this is so, then the resources the police will devote to such investigations will be influenced by the costs associated with applying for the warrant. If the police, absent additional information, would prefer to search, then increasing warrant application costs will induce police to do more pre-application investigation. On the other hand, when the police would forgo a given search unless they learn more definitive information, increasing warrant application costs will reduce pre-application investigation. Even if the legislature thinks that the police are applying exactly the right standard to determine when they should search, the legislature may still want to make warrant applications costly if the police are often inclined to search even when their pre-search investigation turns up little information. Conversely, the fact that the legislature is generally more skeptical than the police about the value of searches does not necessarily justify the imposition of significant warrant application costs.

Judicial Review of Legislative Enactments The focus so far has been on decisions made by the executive branch, as this is the public policy context in which the asymmetric information problem is most frequently discussed. That said, there is a potentially analogous set of arguments with respect to judicial review of legislative decisions, particularly in constitutional cases. Though we often think of such cases as involving only pure questions of law, the inquiry into whether a particular legislative enactment violates a constitutional provision often involves a disputed empirical claim or prediction. For example, deciding whether an exercise of the eminent domain power in the service of economic development satisfies the Public Use Clause may turn on an empirical judgment as to the likely economic benefits of the proposed taking (Kelo v. City of New London [125 S.Ct. 2655 (2005)]). Similarly, deciding whether a restriction on speech serves a legitimate state interest may entail an assessment of the government's claims regarding the likely consequences of permitting the speech in question (Turner Broadcasting v. FCC [512 U.S. 622 (1994)]). Also, the decision

whether a given federal law is a legitimate exercise of Congress's power under Section Five of the Fourteenth Amendment turns, as a matter of Supreme Court case law, on the "congruence and proportionality" between the Congressional mandate and the constitutional harm it seeks to redress (City of Boerne v. Flores [521 U.S. 507 (1997)]). This inquiry necessarily involves a factual assessment of both the existing state of the world and the likely impact of the challenged statute (cf. Nevada Dep't of Human Resources v. Hibbs [538 U.S. 721 (2003)]).

The question therefore arises: How deferentially or aggressively courts should scrutinize legislative findings (or predictions) of constitutionally significant facts? The answer varies by doctrinal area, but at least in some cases the Supreme Court has used rhetoric quite similar to what one observes in the administrative context. Although the Supreme Court has emphasized that the legislature has greater expertise on these issues, in at least a few cases the Court has suggested that it will look closely at the record to make sure that Congress gave adequate consideration to the relevant factual questions and made satisfactory findings (Turner Broadcasting v. FCC [512 U.S. 622 (1994)], University of Alabama v. Garrett [531 U.S. 356 (2001)]). This approach, in the view of some observers, suggests an emerging form of "hard look" review for legislative enactments (Bryant and Simone 2001; Frickey and Smith 2002). One effect of such review in this context, as in the administrative context, would be to raise the relative costs to Congress of enacting particular kinds of statutes (Stephenson 2006).

If something like hard look review of legislative enactments does indeed exist, or if reviewing courts have at their disposal other means by which they can alter the relative costs to Congress of different courses of action, for example through clear statement rules or other techniques of statutory interpretation (Eskridge and Frickey 1992), then the analysis developed here may offer some insights into how these mechanisms influence legislative acquisition of relevant factual information. If legislative expertise, like agency expertise, is endogenous, then assessments of both the level of legislative expertise and of optimal enactment costs

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from the judiciary's perspective must take this fact into account.

6 Conclusion

This paper has developed a formal model to investigate two questions. First, how does a decision-maker's incentive to acquire expertise changes as the enactment cost associated with adopting a new policy change? Second, given this effect, what enactment cost would an uninformed overseer consider optimal?

The model demonstrates that the answer to the first question depends on what the decision-maker would do if it remains uninformed. The incentive to acquire expertise is strongest when the uninformed decision-maker is least sure of its best course of action. Therefore, when an uninformed decision-maker would retain the status quo, increases in enactment costs will decrease expertise, but when an uninformed decision-maker would adopt the new policy, increases in enactment costs will increase expertise.

On the second question, the model shows that the overseer's optimal choice of enactment cost must balance two interests: On one hand, the overseer would like to align the decision-maker's policy preferences with its own, but on the other hand, the overseer would like to increase the agency's incentive to acquire expertise. These interests generally compete, which leads to predictions that can be quite different from what one would predict if the decision-maker's expertise were assumed to be exogenous.

These conclusions have applications to an array of important problems in public law and institutional design. Most obviously, they imply that the study of various forms of bureaucratic oversight must take into account the impact these oversight mechanisms may have on agency expertise. The analysis may also apply to debates over executive power in times of national emergency, legislative and judicial oversight of criminal investigations, and constitutional review of legislation.

The model developed here, of course, is stylized and incomplete. The basic framework

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might be usefully extended to incorporate, for example, the overseer's commitment problem, multiple agencies or overseers, or the possibility that enactment costs might correlate with expertise or information. Work along these and related lines may enrich our understanding of the complex interplay between the policymaking process and the acquisition of policy-relevant information.

Appendix

Proof of Proposition 1

When the agency must choose x at Step 3, research costs c are sunk, so the agency will choose $x = 1$ if and only if $E(b|\sigma) - k > 0$. Therefore, the agency will choose $x = 1$ if (a) the agency observes $\sigma = b > k$, or (b) if the agency observes $\sigma = \emptyset$ and $\mu > k$.

Consider first the case where $\mu < k$. In this case:

$$\frac{d|\mu - k|}{dk} > 0 \tag{1}$$

The agency will choose $x = 1$ if and only if the agency observes $\sigma = b > k$. Therefore, the agency's expected utility at Step 2 is:

$$\begin{aligned}
E(U_A|\mu < k) &= \pi Pr(b > k)[E(b|b > k) - k] - c(\pi) \\
&= \pi \left(\int_k^\infty bf(b)\, db - (1 - F(k))k \right) - c(\pi)
\end{aligned} \tag{2}$$

At Step 2, the agency chooses π^* to solve:

$$\frac{d}{d\pi} E(U_A|\mu < k) = \int_k^\infty bf(b)\, db - (1 - F(k))k - c'(\pi) = 0 \tag{3}$$

By the implicit function theorem, the effect of changes in the enactment cost k on the

agency's preferred level of expertise π^* is:

$$\frac{d\pi^*}{dk} = -\frac{\frac{d}{dk}(\int_k^\infty bf(b)\,db - (1-F(k))k - c'(\pi^*))}{\frac{d}{d\pi^*}(\int_k^\infty bf(b)\,db - (1-F(k))k - c'(\pi^*))} = -\frac{1-F(k)}{c''(\pi^*)} < 0 \tag{4}$$

From equations 1 and 4 it follows immediately that:

$$\frac{d\pi^*}{d|\mu - k|} < 0 \text{ when } \mu < k \tag{5}$$

Next, consider the case where $\mu > k$. In this case:

$$\frac{d|\mu - k|}{dk} < 0 \tag{6}$$

In this case, the agency will choose $x = 1$ if and only if it observes either $\sigma = b > k$ or $\sigma = \emptyset$. Therefore, the agency's expected utility at Step 2 is:

$$
\begin{aligned}
E(U_A|\mu > k) &= \pi Pr(b > k)[E(b|b > k) - k] + (1-\pi)(\mu - k) - c(\pi) \\
&= \pi\left(\int_k^\infty bf(b)\,db - (1-F(k))k\right) + (1-\pi)(\mu - k) - c(\pi)
\end{aligned}
\tag{7}
$$

At Step 2, the agency chooses π^* to solve:

$$\frac{d}{d\pi}E(U_A|\mu > k) = \int_k^\infty bf(b)\,db - (1-F(k))k - (\mu - k) - c'(\pi) \tag{8}$$

By the implicit function theorem, the effect of changes in the enactment cost k on the agency's preferred level of expertise π^* is:

$$\frac{d\pi^*}{dk} = -\frac{\frac{d}{dk}(\int_k^\infty bf(b)db - (1-F(k))k - (\mu - k) - c'(\pi^*))}{\frac{d}{d\pi^*}(\int_k^\infty bf(b)db - (1-F(k))k - (\mu - k) - c'(\pi^*))} = \frac{F(k)}{c''(\pi^*)} > 0 \tag{9}$$

From equations 6 and 9 it follows immediately that:

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$$\frac{d\pi^*}{d|\mu - k|} < 0 \text{ when } \mu > k \tag{10}$$

Equations 5 and 10 are sufficient to establish the proposition for all $k \neq \mu$. All that remains is to show that the agency's expected utility function is continuous at $k = \mu$. This can be shown by noting that at the point where $k = \mu$, the expressions in equations 2 and 7 are equal. The value of π^* at $k = \mu$ solves:

$$\left(\int_\mu^\infty bf(b)db - (1 - F(\mu))\mu \right) = c'(\pi) \tag{11}$$

From equations 4 and 9, we know that this π^* must be the maximum.

Proof of Proposition 2

First, consider the case where $s = \mu$. In this case, $k = s = \mu$ both maximizes the agency's expertise (because $k = \mu$) and minimizes the distance between the agency's policy preferences and the overseer's policy preferences (because $k = s$). Because, holding other factors constant, the overseer's utility is increasing in agency expertise and decreasing in the distance between k and s, it follows immediately that:

$$s = \mu \Rightarrow k^* = s = \mu \tag{12}$$

Next, consider the case where $s > \mu$. First suppose, consistent with the proposition, that $\mu < k^*$. In this case, the ignorant agency would not regulate, so at Step 1 of the game the overseer must have maximized:

$$E(U_O|\mu < k) = \pi^* \left(\int_k^\infty bf(b)\, db \ - (1 - F(k))s \right) - \alpha c(\pi) \tag{13}$$

In this case, because $\mu < k^*$, we know from equation 3 in the proof of Proposition 1 that $c'(\pi^*) = \int_k^\infty bf(b)\, db - (1 - F(k))k$. Therefore, the overseer's optimal k^* must solve:

$$\frac{d\pi^*}{dk}(1 - F(k))\left(\frac{\int_k^\infty bf(b)\,db}{1 - F(k)}(1 - \alpha) + \alpha k - s\right) = \pi^* f(k)(k - s) \tag{14}$$

Because $\mu < k^*$, $\frac{d\pi^*}{dk} < 0$ (see equation 4 in the proof of Proposition 1). The values of π^*, $f(k^*)$, and $1 - F(k)$ are all positive. Finally, $\frac{\int_k^\infty bf(b)\,db}{1 - F(k)} = E(b|b > k) > k$ and $1 > \alpha \geq 0$, so $\frac{\int_k^\infty bf(b)\,db}{1 - F(k)}(1 - \alpha) + \alpha k - s > k - s$. From this it follows that the equality in equation 14 can be satisfied only by a $k^* < s$.

Now suppose that, inconsistent with the proposition, $s > \mu$ but $\mu > k^*$. In this case, the ignorant agency would regulate, so in order to select this k^* the overseer at Step 1 of the game must have maximized:

$$E(U_O|\mu > k) = \pi^*\left(\int_k^\infty bf(b)\,db - (1 - F(k))s\right) + (1 - \pi^*)(\mu - s) - \alpha c(\pi) \tag{15}$$

Because in this case $\mu > k^*$, we know from equation 8 that $c'(\pi^*) = -\int_{-\infty}^k bf(b)\,db + F(k)k$. Therefore, the overseer's optimal k^* must solve:

$$-\frac{d\pi^*}{dk}F(k)\left(\frac{\int_{-\infty}^k bf(b)\,db}{F(k)}(1 - \alpha) + \alpha k - s\right) = \pi^* f(k)(k - s) \tag{16}$$

Because $\mu > k^*$, $\frac{d\pi^*}{dk} > 0$ (see equation 9 in the proof of Proposition 1). The values of π^*, $f(k^*)$, and $F(k)$ are all positive. Finally, $\frac{\int_{-\infty}^k bf(b)\,db}{F(k)} = E(b|b < k) < k$ and $1 > \alpha \geq 0$, so $\frac{\int_{-\infty}^k bf(b)\,db}{F(k)}(1 - \alpha) + \alpha k - s < k - s$. This means that the equality in equation 16 can only be satisfied by a $k^* > s$. But this would contradict the assumption that $s > \mu > k^*$. It follows that:

$$s > \mu \Rightarrow s > k^* \geq \mu \tag{17}$$

Next, consider the case where $s < \mu$. First suppose, consistent with the proposition, that $\mu > k^*$. In this case, the ignorant agency would regulate, so this k^* must satisfy equation

16, which implies that $\mu > k^* > s$, consistent with the proposition. Now suppose, contrary to the proposition, that $\mu < k^*$. Because the ignorant agency would not regulate in this case, this k^* must satisfy equation 14. But that implies that $k^* < s$, which contradicts the assumption that $s < \mu < k^*$. Therefore:

$$\mu > s \Rightarrow \mu \geq k^* > s \tag{18}$$

Equations 12, 17, and 18 are sufficient to establish the proposition.

Proof of Proposition 3

If the agency is uninformed, it will select (according to some arbitrarily chosen selection device) some $i \in \mathbf{m}$. Designate the i chosen by the ignorant agency as j. The uninformed agency will receive expected utility $\int y_j(b)f(b)db - k_j$. If the agency is informed, it will select the i that maximizes $y_i(b) - k_i$. Therefore, the agency's expected utility at Step 2, when it chooses π, is:

$$EU_A = \pi \left(\int \max_i \left(y_i(b) - k_i \right) f(b)db - \left(\int y_j(b)f(b)db - k_j \right) \right) + \int y_j(b)f(b)db - k_j - c(\pi) \tag{19}$$

It follows that:

$$\frac{d}{d\pi}EU_A = \int \max_i \left(y_i(b) - k_i \right) f(b)db - \left(\int y_j(b)f(b)db - k_j \right) - c'(\pi) \tag{20}$$

So, the agency's optimal π, denoted π^*, will solve:

$$\int \max_i \left(y_i(b) - k_i \right) f(b)db - \left(\int y_j(b)f(b)db - k_j \right) = c'(\pi) \tag{21}$$

The left-hand side of equation 21 is decreasing in all $k_{i \notin \mathbf{m}}$, but increasing in k_j. Because $c'(\pi) > 0$, this means π^* is increasing in $k_{j \in \mathbf{m}}$ but decreasing in $k_{i \notin \mathbf{m}}$.

Note that this result is premised on the condition that $j \in \mathbf{m}$; otherwise, j would never be selected by the ignorant agency. Therefore, $\frac{d}{d\pi}EU_A$ is increasing in k_j only if the other values of $k_{i \in \mathbf{m}}$ increase simultaneously, such that it remains true that $j \in \mathbf{m}$.

Proof of Proposition 4

In this case where $\mu < k^*$, the optimal k^* must satisfy the equality in equation 14 in Proposition 2. When $\alpha = 1$, that equality simplifies to:

$$\frac{d\pi^*}{dk}(1 - F(k))(k - s) = \pi^* f(k)(k - s) \tag{22}$$

This equality can be satisfied only when $k = s$.

In the case where $\mu > k^*$, the optimal k^* must satisfy the equality in equation 16 in Proposition 2. When $\alpha = 1$, that equality simplifies to:

$$-\frac{d\pi^*}{dk}F(k)(k - s) = \pi^* f(k)(k - s) \tag{23}$$

This equality can also be satisfied only when $k = s$.

Proof of Proposition 5

In the case where $\mu < k^*$, the overseer's optimal k^* must satisfy the equality in equation 14 in the proof of Proposition 2. When $\alpha > 1$, $\frac{\int_k^\infty b f(b)\, db}{1 - F(k)}(1 - \alpha) + \alpha k - s < k - s$. From this it follows that the equality in equation 14 can be satisfied only by a $k^* > s$.

In the case where $\mu > k^*$, the overseer's optimal k^* must satisfy the equality in equation 16 in the proof of Proposition 2. When $\alpha > 1$, $\frac{\int_{-\infty}^k b f(b)\, db}{F(k)}(1 - \alpha) + \alpha k - s > k - s$. This means that the equality in equation 16 can only be satisfied by a $k^* < s$.

This suffices to establish that k^* is outside of the range between μ and s. There will be two candidate k^* values, one of which satisfies equation 14, the other of which satisfies equation 16. The overseer's optimal k^* will be the greater of these two values.

■

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