

A COSTLY SIGNALING THEORY OF “HARD LOOK” JUDICIAL REVIEW

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American public law entrusts judges with considerable power to review the decisions of other government actors. While judicial review sometimes involves only abstract questions of law, more often it entails implicit or explicit evaluation of a government decision-maker’s empirical or predictive judgments. Yet most judges are generalist lawyers with minimal experience in scientific, economic, or policy analysis. The government actors whose decisions are reviewed, on the other hand, are often thought to have considerable expertise in such matters. This creates a dilemma for reviewing courts and raises a more general puzzle regarding the design of American public law institutions. The dilemma for courts is that judges do not want to abdicate their responsibility or their power to constrain other government officials, but they are reluctant to second-guess the choices of more expert decision-makers, especially when complex or technical issues are involved. The institutional design puzzle is how one might account for pervasive review of expert decisions by non-expert courts, and whether mechanisms have emerged to address the difficulties inherent in this sort of arrangement.

One judicial response to the dilemma just described is to require that the government provide a satisfactory explanation for its proposed action, often in the form of a written record or statement. Proponents of this approach, which is sometimes referred to as “hard look” review,¹ contend that judicial scrutiny of government explanations can reconcile the perceived need for expert decision-making and the perceived need for a judicial check. This proposed reconciliation, however, is problematic. The same lack of expertise that makes it hard for a generalist court to evaluate a government decision on the merits also makes it hard for the court to assess the coherence, accuracy, and methodological soundness of the government’s explanation for its action. Critics of hard look review have also raised serious questions about whether the kind of lawyerly rationality demanded by reviewing courts has any particularly strong connection to

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¹ The term “hard look” review was coined by Judge Harold Leventhal of the D.C. Circuit. See *Pikes Peak Broadcasting Co. v. FCC*, 422 F.2d 671, 682 (D.C. Cir. 1969); *Greater Boston Television Corp. v. FCC*, 444 F.2d 841, 851 (D.C. Cir. 1970). As originally formulated by Judge Leventhal, the term “hard look” review referred to the idea that reviewing courts are supposed to ensure that the agency has taken a “hard look” at salient aspects of the decision problem. Over time, however, the phrase has come to connote the idea that courts are supposed to take a “hard look” at the agency’s decision process. See *National Lime Assoc. v. EPA*, 627 F.2d 416, 451 n. 126 (D.C. Cir. 1980).

substantively rational policy making. Therefore, in those cases where it is difficult or impossible for courts to assess the substance of the government's explanation for its decision, it is not always clear what hard look review accomplishes, and some have suggested that it amounts to little more than meaningless theater.

The thesis of this Article is that judicially-imposed explanation requirements can help reviewing courts overcome their comparative informational disadvantage for reasons that are independent of the (in)ability of courts to understand or verify the substantive content of the justifications advanced by government decision-makers. The argument is based on two key assumptions. The first is that the expected benefit of a proposed policy from the reviewing court's perspective is positively correlated with the benefit of that policy to the government. The second assumption is that the court can use the quality of the government's explanation – where “quality” as used here is a shorthand for what one might think of as the more superficial aspects of quality (polish, thoroughness, detail, complexity, raw length) – as a rough proxy for the costs the government incurred in producing this explanation. If these assumptions hold, then the court can reason that the expert government decision-maker's willingness to “burn money” by investing time and energy to produce a high-quality explanation signals that the government believes the benefits of the proposed policy are high; because the preferences of the court and the government are positively correlated in expectation, the fact that the government places a high value on the policy in question means the policy is more likely to be acceptable from the court's perspective. Therefore, judicial evaluation of the quality of the government's explanation ameliorates the court's informational disadvantage, even when the court is incapable of assessing the methodological soundness or analytical coherence of the content of this explanation.²

² This argument is similar to the hypothesis advanced in the economics literature that the primary function of much corporate advertising is not to convey factual information about a product, but rather to signal a firm's willingness to spend money on advertising. See Paul Milgrom & John Roberts, *Price and Advertising Signals of Product Quality*, 94 J. POL. ECON. 796 (1986); Phillip Nelson, *Information and Consumer Behavior*, 78 J. POL. ECON. 311 (1970); Phillip Nelson, *Advertising as Information*, 81 J. POL. ECON. 729 (1974). In many cases, a high level of spending on advertising can only be recouped if customers purchase the product repeatedly. Therefore, spending on advertising signals the firm's confidence that consumers who purchase the product once will become repeat customers. Other formal models use a similar “burning money” argument in different contexts. See David Austen-Smith & Jeffrey S. Banks, *Cheap Talk and Burned Money*, 91 J. ECON. THEORY 1 (2000); B. Douglas Bernheim & Lee Redding, *Optimal Money Burning: Theory and Application to Corporate Dividend Policy*, 10 J. ECON. & MGMT STRATEGY 463 (2001); Hans Gersbach, *The Money-Burning Refinement: With an Application to a Political Signaling Game*, 33 INT'L J. GAME THEORY 67 (2004); Edward M. Iacobucci, *Toward a Signaling Explanation of the Private Choice of Corporate Law*, 6 AM. L. & ECON. REV. 319 (2004). Some legal scholars have suggested applications of this type of model that are similar to the argument developed in this Article. See Eric Posner, *Controlling Agencies with Cost-Benefit Analysis: A Positive Political Theory Perspective*, 68 U. CHI. L. REV. 1137, 1160-61 (2001) (suggesting that an expensive but uninformative cost-benefit analysis may be a way for a regulating agency to signal to the reviewing President that proposed regulation has a high value); Jason Scott Johnston, *A Game Theoretic Analysis of Alternative Institutions for Regulatory Cost-Benefit Analysis*, 150 U. PENN. L. REV. 1343, 1369 (2002) (suggesting that lobbying by regulatory targets can signal their compliance costs); *id.* at 1377 (suggesting that a requirement that agencies conduct costly regulatory analyses screens out low-value regulations); Emerson H. Tiller, *Resource-Based Strategies in Law and Positive Political Theory: Cost-Benefit Analysis and the Like*, 150

This hypothesis provides an alternative perspective on the institutional relationship between generalist reviewing courts and expert government decision-makers. While signaling may not be the sole or even the primary function of judicially-imposed explanation requirements, understanding hard look review in signaling terms may help explain some of the more puzzling aspects of this sort of review and suggest additional positive hypotheses about how hard look review operates in practice. More generally, this Article suggests the importance of paying more attention to subtle and indirect institutional mechanisms that the American legal system has developed to mitigate informational asymmetries and to preserve meaningful checks and balances. Costly signaling through the quality of the government's formal explanation and justification for its decisions may be one such mechanism. There are almost certainly others, and identifying and analyzing them is important to understanding the structure of American public law institutions. This Article develops the costly signaling explanation for hard look review, using judicial review of administrative agency regulations as a paradigm case. Part I explains the basic logic of the theory, derives behavioral predictions, and considers important objections. Part II extends the analysis to incorporate the possibility that government actors may not always have better information than the courts. Part III considers potential applications of the theory to aspects of constitutional law and criminal procedure. The Article also includes an Appendix that models formally the strategic interactions that are discussed qualitatively in Parts I and II.

I. THE COSTLY SIGNALING THEORY OF HARD LOOK REVIEW

A. *Hard Look Review of Agency Regulations*

The costly signaling theory of hard look review has applications to a range of public law contexts in which generalist courts review the decisions of expert government decision-makers. To sharpen the discussion and clarify the logic of the argument, it is helpful to focus on what may be the paradigm case of generalist judicial review of expert government decision-making: judicial review of agency regulations under §706 of the Administrative Procedure Act (APA) and/or the more specific review provisions contained in particular statutes. The delegation of substantial quasi-legislative power to administrative agencies is often justified in terms of agencies' superior expertise and insulation from the undesirable effects of legislative politics.³ Precisely these characteristics of administrative agencies, however, raise the specter of arbitrary rule by unelected technocrats.⁴ That fear may be exaggerated, as agencies are subject to some

U. PENN. L. REV. 1453, 1459 (2002) (noting that the “essence of [hard look review] is to attack the reasoning process of the regulator and force it to spend more of its resources (whether through more extensive studies or more detailed reasoning of policy choices) to achieve its desired policy objective”).

³ See JAMES M. LANDIS, *THE ADMINISTRATIVE PROCESS* (1938); David B. Spence & Frank Cross, *A Public Choice Case for the Administrative State*, 89 GEO. L.J. 97 (2000).

⁴ See THEODORE S. LOWI, *THE END OF LIBERALISM* (2d ed. 1979); DAVID SCHOENBROD, *POWER WITHOUT RESPONSIBILITY* (1993).

degree of political control by both the President and Congress.⁵ Nonetheless, concerns about unchecked administrative governance have given rise to a system in which, as Louis Jaffe famously insisted, judicial review of administrative action “is the necessary condition, psychologically if not logically, of a system of administrative power which purports to be legitimate, or legally valid.”⁶

The tension between the judiciary’s interest in constraining the exercise of administrative power and its awareness of the limits of its institutional competence is apparent in the leading cases on the appropriate standard of review to apply when courts inquire, pursuant to the APA, whether an agency’s decision is “arbitrary, capricious, or an abuse of discretion.”⁷ Reviewing courts could have interpreted their mandate to strike down “arbitrary” agency action as a license to evaluate agency regulations on the merits, but doing so would have raised problems not only of institutional legitimacy but of institutional competence. Courts also might have interpreted the arbitrary and capricious standard as authorizing reversal only of those agency actions so obviously lunatic that no reasonable person could have adopted them. This, though, would render trivial any judicial check on agency policy-making. The courts have instead charted a different course, shifting the emphasis of review under §706 and analogous provisions away from a substantive assessment of the government’s decision and toward an evaluation of the government’s explanation of the reasoning and analysis underlying that decision.⁸ So, while the Supreme Court has instructed that a reviewing court must not “substitute its judgment for that of the agency,”⁹ it has also instructed that the reviewing court conduct a “searching and careful” inquiry into “whether the [agency’s] decision was based on a consideration of the relevant factors and whether there has been a clear error of

⁵ On presidential control of the administration, see, e.g., Elena Kagan, *Presidential Administration*, 114 HARV. L. REV. 2245 (2001); Terry M. Moe & Scott A. Wilson, *Presidents and the Politics of Structure*, 57 L. & CONTEMP. PROBS. 1 (1994); Terry M. Moe, *An Assessment of the Positive Theory of ‘Congressional Dominance’*, 12 LEG. STUD. Q. 475 (1987). On congressional oversight, see, e.g., JOEL D. ABERBACH, *KEEPING A WATCHFUL EYE* (1990); Mathew D. McCubbins, Roger G. Noll & Barry R. Weingast, *Structure and Process, Politics and Policy: Administrative Arrangements and the Political Control of Agencies*, 75 VA. L. REV. 481 (1989); Mathew D. McCubbins & Thomas Schwartz, *Congressional Oversight Overlooked: Police Patrols vs. Fire Alarms*, 28 AM. J. POL. SCI. 165 (1984); Barry R. Weingast & Mark J. Moran, *Bureaucratic Discretion or Congressional Control? Regulatory Policymaking by the Federal Trade Commission*, 91 J. POL. ECON. 765 (1983).

⁶ LOUIS JAFFE, *JUDICIAL CONTROL OF ADMINISTRATIVE ACTION* 320 (1965).

⁷ 5 U.S.C. §706(2)(A).

⁸ See Stephen Breyer, *Judicial Review of Questions of Law and Policy*, 38 ADMIN. L. REV. 363, 383 (1986); Colin S. Diver, *Policymaking Paradigms in Administrative Law*, 95 HARV. L. REV. 393, 409-28 (1981); Jerry L. Mashaw & David L. Harfst, *Regulation and Legal Culture: The Case of Motor Vehicle Safety*, 4 YALE J. ON REG. 257, 276-79 (1987); Thomas O. McGarity, *The Courts and the Ossification of Rulemaking: A Response to Professor Seidenfeld*, 75 TEX. L. REV. 525, 527 (1997) [hereinafter *Ossification*]; Thomas O. McGarity, *Some Thoughts on “Deossifying” the Rulemaking Process*, 41 DUKE L.J. 1385, 1400, 1410-11 (1992) [hereinafter *Deossifying*]; Thomas O. Sargentich, *The Critique of Active Judicial Review of Administrative Agencies: A Reevaluation*, 49 ADMIN. L. REV. 599, 629 (1997); Martin Shapiro, *APA: Past, Present, Future*, 72 VA. L. REV. 447, 477 (1986); Sidney A. Shapiro & Richard E. Levy, *Heightened Scrutiny of the Fourth Branch: Separation of Powers and the Requirement of Adequate Reasons for Agency Decisions*, 1987 DUKE L.J. 387, 411-13, 419-25.

⁹ *Citizens to Preserve Overton Park, Inc. v. Volpe*, 401 U.S. 402, 416 (1971).

judgment.”¹⁰ To satisfy this requirement, the agency must 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.”¹¹ A similar type of approach – that is, an emphasis on the adequacy of the record and the quality of the agency’s explanation – is evident in judicial review of administrative action in other doctrinal contexts as well,¹² and may also occur in cases of non-judicial review of agency action, e.g. review by the Office of Management and Budget (OMB).¹³

Though there is considerable variation in how courts apply the hard look standard in practice, the general pattern involves a preliminary statement by the court that the judicial role is limited to assessing whether the agency acted reasonably, followed by some degree of judicial scrutiny, at the behest of the aggrieved parties, of the agency’s evidence and arguments in favor of its more controversial conclusions. More often than not, significant agency regulations survive hard look review,¹⁴ but in many of these cases the reviewing court reaches this conclusion only after an extended discussion and assessment of the agency’s defense of its action. In *Sierra Club v. Costle*, for example, the D.C. Circuit considered multiple challenges to an Environmental Protection Agency (EPA) rule establishing New Source Performance Standards for coal-fired power plants.¹⁵ The court upheld the rule, but only after issuing a 110-page opinion, approximately 45 pages of which were devoted specifically to considering EPA’s record evidence and arguments in favor of its approach.¹⁶ Judge Wald’s opinion for the court emphasized in conclusion that the court had “read the record with as hard a look as mortal judges can probably give its thousands of pages” and had “probed the agency’s rationale, studied its references ... [and] endeavored to understand them....”¹⁷ A similar approach is evident in *United*

¹⁰ *Overton Park*, 401 U.S., at 416.

¹¹ *Motor Vehicle Mfrs. Ass’n v. State Farm Mut. Auto. Ins. Co.*, 463 U.S. 29, 43 (1983) (quoting *Burlington Truck Lines v. United States*, 371 U.S. 156, 168 (1962)) (internal quotation marks omitted).

¹² For example, though hard look review normally refers to judicial inquiry into whether an agency’s action is arbitrary and capricious, courts sometimes engage in a functionally equivalent sort of review in the context of assessing whether the agency has provided a satisfactory “statement of [] basis and purpose,” 5 U.S.C. §553(c). See *United States v. Nova Scotia Food Products Corp.*, 568 F.2d 240, 252-53 (1977). Also, courts sometimes engage in this kind of review when deciding whether an agency’s decision is based on “substantial evidence.” See *infra* notes 18, 51.

¹³ One might argue that OMB review is dissimilar to judicial review because OMB’s reviewers are experts, if not in the scientific and substance-specific aspects of regulation, then at least in the techniques of cost-benefit analysis. Though there may be some truth to this, there is reason to suspect that OMB review faces at least some of the same difficulties as reviewing courts. OMB has a relatively small staff, especially given the size and difficulty of its mandate, and the agencies it reviews have considerable advantages in terms of staff and resources. See Thomas O. McGarity, *Regulatory Analysis and Regulatory Reform*, 65 TEX. L. REV. 1243, 1276-66 (1987). For applications of a related set of arguments specifically in the context of presidential review of administrative action, see Posner, *supra* note 2, at 1160-61.

¹⁴ See William S. Jordan, III, *Ossification Revisited: Does Arbitrary and Capricious Review Significantly Interfere with Agency Ability to Achieve Regulatory Goals Through Informal Rulemaking?*, 94 NW. L. REV. 393, 395-98 (2000); Patricia M. Wald, *Judicial Review in Mid-Passage: The Uneasy Partnership Between Courts and Agencies Plays On*, 32 Tulsa L.J. 221, 233 n.70 (1996).

¹⁵ 657 F.2d 298 (D.C. Cir. 1981).

¹⁶ *Sierra Club*, 657 F.2d at 322-39, 347-51, 360-73, 377-83.

¹⁷ *Sierra Club*, 657 F.2d at 410.

Steelworkers v. Marshall, in which the D.C. Circuit upheld the conclusion of the Occupational Safety and Health Administration (OSHA) that a permissible exposure limit (PEL) for lead of 50 micrograms per cubic meter was reasonably necessary to prevent a significant and material risk to human health.¹⁸ The court explained that its obligation was to “examine the sequence of reasoning that led OSHA” to adopt this specific PEL¹⁹ and to ensure that OSHA’s factual conclusions were “supported by substantial evidence.”²⁰ After noting that OSHA had provided “extremely detailed summaries and explanations of the evidence”²¹ and providing an extended 16 page discussion of the disputes related to this evidence, the court held that OSHA’s finding was adequately supported.²² In these and other cases, reviewing courts have upheld agency action under some variant of the hard look approach, but only after the agency has provided a lengthy discussion and analysis of the key issues.

In a few high-profile cases, the court conducting hard look review has found an agency’s explanation deficient. In these cases, the court often indicates what the agency would need to do – usually more or more elaborate research or analysis – in order to satisfy the hard look standard. In one well-known example, *Corrosion Proof Fittings v. EPA*, the Fifth Circuit vacated an EPA rule banning the manufacture and distribution of asbestos products.²³ The court held that EPA had failed to meet its burden under the Toxic Substances Control Act of demonstrating that a ban was the “least burdensome” way to prevent an “unreasonable risk of injury to health or the environment.”²⁴ The Fifth

¹⁸ 647 F.2d 1189, 1244-63 (D.C. Cir. 1980). The court reviewed OSHA’s decision under a “substantial evidence” standard than the arbitrary and capricious standard of review in §706(A)(2) of the APA because the Occupational Safety and Health Act specifically provides that the OSHA’s determinations “shall be conclusive if supported by substantial evidence in the record as a whole,” 29 U.S.C. §655(f). This standard, like the arbitrary and capricious standard, has been treated by courts as calling for a “hard look” at the agency’s decision. See, e.g., *Building & Constr. Trades Dep’t v. Brock*, 838 F.2d 1258, 1266 (D.C. Cir. 1988) (stating that the role of a court reviewing an OSHA regulation under the §655(f) standard is “not to decide what assumptions or findings we would make were we in the Secretary’s position,” but instead to “scrutinize the record to ensure that the Secretary has made his findings of fact on the basis of substantial evidence and has provided a reasoned explanation for his policy assumptions and conclusions”; see also *United Steelworkers*, 647 F.2d at 1207. Some courts have argued that the §655(f) standard, though deferential, calls for a “harder look” than typical arbitrary and capricious review. See *AFL-CIO v. OSHA*, 965 F.2d 962, 970 (11th Cir. 1992); *Asbestos Info. Ass’n v. OSHA*, 727 F.2d 415, 421 (5th Cir. 1984). For purposes of the analysis in this Article, there is no meaningful difference between the standard of review mandated by the APA and the substantial evidence standard mandated by the Occupational Safety and Health Act, given the similarity of the judicial approach in both doctrinal contexts.

¹⁹ *United Steelworkers*, 647 F.2d at 1244-45.

²⁰ *Id.* at 1253.

²¹ *Id.*

²² *Id.* at 1248-63. Although the *United Steelworkers* court upheld most aspects of OSHA’s lead rule, including the selection of the PEL, the court did find that there was not sufficient evidence in the record to support OSHA’s determination that the standard was technically and economically feasible for certain industries. *Id.* at 1278-1308. OSHA addressed this problem in regulations announced in subsequent rulemaking proceedings, most but not all of which were upheld on hard look review. See *Amer. Iron & Steel Inst. v. OSHA*, 939 F.2d 975 (D.C. Cir. 1991).

²³ 947 F.2d 1201 (5th Cir. 1991).

²⁴ *Id.* at 1214-29. Like the Occupational Safety and Health Act, the Toxic Substances Control Act (TSCA) imposes a substantial evidence standard of review in lieu of the otherwise applicable “arbitrary and

Circuit not only found that EPA had failed adequately to consider alternatives, but it also expressed “concern[s] about some of the methodology employed by EPA” and indicated that, if EPA wanted to re-enact its asbestos ban, it would need to provide a more extended discussion of factors like appropriate discounting, substitute products, unquantified benefits, and exposure estimates.²⁵ More generally, the court described the EPA’s consideration of the economic costs of its proposed regulation as “cavalier” and its consideration of undesirable side effects as “ cursory.”²⁶ In another widely-discussed case, *AFL-CIO v. OSHA*, the Eleventh Circuit invalidated an OSHA rule that attempted to set PELs for 428 workplace air contaminants.²⁷ The Eleventh Circuit held that OSHA had failed to fulfill its responsibility “to quantify or explain, at least to some reasonable degree, the risk posed by *each* toxic substance regulated.”²⁸ For most of these substances, the court complained, OSHA had merely “cited a few studies and then established a PEL without explaining why the studies mandated the particular PEL chosen.”²⁹ Though the court acknowledged that OSHA’s resource constraints made it impossible for the agency to “go[] through a detailed analysis for each of the 428 different substances regulated,” the court insisted that this sort of analysis was required by the statute.³⁰

Defenders of this sort of hard look review, including the courts that carry it out, argue that it ensures the supposedly expert agency really has based its decision on a reasoned analysis of relevant information.³¹ Sometimes this claim is framed in terms of the efficacy of hard look review in correcting specific decision-making biases and

capricious” standard contained in the APA. 15 U.S.C. §2618(c)(1)(B)(i). *See also Corrosion Proof Fittings*, 947 F.2d at 1213-14 (noting that the TSCA’s substantial evidence standard is more stringent than the APA’s arbitrary and capricious standard). That said, the basic analytical framework applied under the TSCA’s substantial evidence standard parallels the hard look approach used for review under APA §706. *See id.* at 1214 (stating that agency must “coherently explain why it has exercised its discretion in a given matter and must offer a rational connection between the facts found and the choice made”) (citations and quotation marks omitted)).

²⁵ *Corrosion Proof Fittings*, 947 F.2d at 1218-22.

²⁶ *Id.* at 1223-24.

²⁷ 965 F.2d 962 (11th Cir. 1992).

²⁸ *Id.* at 975 (emphasis in original).

²⁹ *Id.* at 976.

³⁰ *Id.* at 987.

³¹ *See* Ronald M. Levin, *Judicial Review and the Uncertain Appeal of Certainty on Appeal*, 44 DUKE L.J. 1081, 1100 (1995); William F. Pedersen, Jr., *Formal Records and Informal Rulemaking*, 85 YALE L.J. 38, 59-60 (1975); Sargentich, *supra* note 8, at 631; Mark Seidenfeld, *Demystifying Deossification: Rethinking Recent Proposals to Modify Judicial Review of Notice and Comment Rulemaking*, 75 TEX. L. REV. 483, 514, 521 (1997); Sidney A. Shapiro & Richard E. Levy, *Judicial Incentives and Indeterminacy in Substantive Review of Administrative Decisions*, 44 DUKE L.J. 1051, 1077 (1995); Shapiro & Levy, *supra* note 8, at 430; Cass Sunstein, *In Defense of the Hard Look: Judicial Activism and Administrative Law*, 7 HARV. J. L. & PUB. POL’Y 51, 53 (1984) [hereinafter Sunstein, *Defense*]; Cass Sunstein, *On the Costs and Benefits of Aggressive Judicial Review of Agency Action*, 1989 DUKE L.J. 522, 527-29 (hereinafter *Costs and Benefits*); Patricia M. Wald, *Judicial Review of Complex Administrative Agency Decisions*, 462 ANNALS AM. ACAD. POL. & SOC. SCI. 72, 77 (1982).

pathologies to which agencies are thought to be vulnerable.³² Sometimes the claim is framed as a more general argument that hard look review encourages agencies to engage in a superior (e.g., more comprehensively rational, more deliberative) decision-making process.³³ So, for example, although Professor Cass Sunstein observed that the Fifth Circuit’s aggressive evaluation of the EPA’s cost-benefit analysis in *Corrosion Proof Fittings* “went far beyond what the statute unambiguously invited”³⁴ and erred in some respects,³⁵ Professor Sunstein nonetheless concluded that the *Corrosion Proof Fittings* approach was desirable in that it prevented EPA from basing a regulation on unjustified assumptions.³⁶ More generally, proponents of hard look review claim that the approach taken by the D.C. Circuit in cases like *Sierra Club* and *United Steelworkers* – adopting a deferential posture but requiring the agency to supply a detailed and well-reasoned analysis of the scientific basis for its regulation – has a positive effect on regulatory quality. The argument presumes – sometimes implicitly, sometimes explicitly – that the hard look review of the agency’s record of decision and statement of basis and purpose provides a reviewing court with valuable information as to the likely quality of the agency’s decision, even if the court is ill-equipped to evaluate the details of the agency’s

³² One such argument is the claim that hard look review can counteract the ability of narrow interest groups to exert undue influence on regulatory agencies to extract special favors at public expense. See Jonathan R. Macey, *Separated Powers and Positive Political Theory: The Tug of War Over Administrative Agencies*, 80 GEO. L. J. 671, 675 (1992); Sargentich, *supra* note 8, at 631-32; Shapiro & Levy, *supra* note 8, at 412-13; Cass Sunstein, *Constitutionalism After the New Deal*, 101 HARV. L. REV. 421, 469 (1987); Cass Sunstein, *Interest Groups in American Public Law*, 38 STAN. L. REV. 29, 63 (1985) [hereinafter *Interest Groups*]. A related argument is that hard look review helps ensure input from a broader base of agency staff members, with diverse professional backgrounds; absent hard look review, regulations may reflect the more parochial views of a particular subgroup within the agency. See Pedersen, *supra* note 31, at 59-60; Seidenfeld, *supra* note 31, at 506-10. A third argument in this family is that experts are vulnerable to particular cognitive biases, such as overconfidence and tunnel vision, that hard look review by lay judges can mitigate. See Jeffrey J. Rachlinski & Cynthia R. Farina, *Cognitive Psychology and Optimal Government Design*, 87 CORNELL L. REV. 549, 588-89, 596-97, 600 (2002); Mark Seidenfeld, *Cognitive Loafing, Social Conformity, and Judicial Review of Agency Rulemaking*, 87 CORNELL L. REV. 486, 496-99, 509-10, 547-48 (2002). But see William N. Eskridge & John Ferejohn, *Structuring Lawmaking To Reduce Cognitive Bias: A Critical View*, 87 CORNELL L. REV. 616, 628-29, 630-31 (2002)

³³ On comprehensive rationality – also sometimes referred to as “synoptic” decision-making – see Diver, *supra* note 8, at 409-21; Sunstein, *Interest Groups*, *supra* note 32, at 64. On the role of judicial review in promoting deliberation, see Jim Rossi, *Redeeming Judicial Review: The Hard Look Doctrine and Federal Regulatory Efforts to Restructure the Electric Utility Industry*, 1994 WIS. L. REV. 764, 811, 818-20; Mark Seidenfeld, *A Civic Republican Justification for the Bureaucratic State*, 105 HARV. L. REV. 1511, 1570 (1992); Sunstein, *Interest Groups*, *supra* note 32, at 61-63.

³⁴ Cass Sunstein, *Cost-Benefit Default Principles*, 99 MICH. L. REV. 1651, 1682 (2001).

³⁵ *Id.* at 1714 (criticizing the Fifth Circuit’s analysis of discount rates).

³⁶ *Id.* at 1711. See also Cass R. Sunstein, *Legislative Forward: Congress, Constitutional Moments, and the Cost-Benefit State*, 48 STAN. L. REV. 247, 294 & n.235 (1996) (stating that judicial review should be available to “police administrative decisions for reasonableness” and citing *Corrosion Proof Fittings*); Sunstein, *Defense*, *supra* note 31, at 53 (noting, in an apparent reference to *Corrosion Proof Fittings* and other cases, that “[s]ome courts, notably the United States Court of Appeals for the Fifth Circuit, have used the hard look approach to ensure that regulatory controls are well-founded in the facts and in statutory policy”).

scientific, economic, social, and political analyses.³⁷ The fact that the agency was able to supply the court with an explanation that appears reasonable to generalist judges, along with sufficient references to record evidence, is presumed to be both necessary and sufficient for a reviewing court to conclude that the regulation is justified.

Critics of hard look review disagree. They argue, first, that the actual process of government decision-making often bears little resemblance to the formalized statement of reasons offered in an administrative record. Agency staffers, particularly agency lawyers, will do their best to generate a record and explanation of reasons adequate to satisfy a reviewing court. This record-generation activity, however, may have little connection to the actual decision-making process.³⁸ This problem is compounded by the complaint that the same lack of expertise that prevents judges from evaluating the substantive merit of an agency's decision also impedes their ability to assess whether the agency's proffered explanation is sensible. As Professor Martin Shapiro puts it, "Courts cannot take a hard look at materials they cannot understand nor be partners to technocrats in a realm in which only technocrats speak the language."³⁹ Professor Thomas McGarity agrees, observing that "judges do not always have a good sense for what matters and what does not in a complex rulemaking initiative."⁴⁰ Indeed, while Professor Sunstein uses the *Corrosion Proof Fittings* opinion as an illustration of the salutary effects of hard look review, Professor McGarity's assessment is much different: "The three judges on the panel," he charges, "had no experience with the difficulties encountered in administering a technically complex regulatory program, and they lacked the expertise in the scientific

³⁷ A related argument is that hard look review forces the government to present its analysis and conclusions in a form that the courts, and the general public, can understand – if not perfectly, then at least well enough to assess the reasonableness of the government's decision. See Rossi, *supra* note 33, at 820-22; Patricia M. Wald, *Judicial Review in the Time of Cholera*, 49 ADMIN. L. REV. 659, 665-66 (1997).

³⁸ Martin Shapiro puts the point bluntly: "[I]nstead of telling the truth, agencies can lie; this is mostly what they do these days. They can dress each of their guestimates about the facts ... in enormous, multilayered costumes of technocratic rationality. They can weave shrouds of data and analysis designed to proclaim the scientific rationality of every choice they have made." MARTIN SHAPIRO, WHO GUARDS THE GUARDIANS? JUDICIAL CONTROL OF ADMINISTRATION 151-52 (1988). Agencies accomplish this by "hir[ing] more lawyers and giv[ing] them more of a role in producing decisions that will withstand court scrutiny." *Id.* at 154. See also Frank B. Cross, *Pragmatic Pathologies of Judicial Review of Administrative Rulemaking*, 78 N.C. L. REV. 1013, 1046 (2000); Mashaw & Harfst, *supra* note 8, at 276, 296 & n. 98; McGarity, *supra* note 13, at 1328; McGarity, *Deossifying*, *supra* note 8, at 1412; Richard J. Pierce, Jr., *Seven Ways to Deossify Agency Rulemaking*, 47 ADMIN. L. REV. 59, 67-68, 81-82 (1995) [hereinafter *Seven Ways*]; Richard J. Pierce, Jr., *The Unintended Effects of Judicial Review of Agency Rules: How Federal Courts Have Contributed to the Electricity Crisis of the 1990s*, 43 ADMIN. L. REV. 7, 27 (1991) [hereinafter *Unintended Effects*]; Shapiro, *supra* note 8, at 490; Tiller, *supra* note 2, at 1459. Even some hard look proponents concede that this happens sometimes, though they argue these cases are exceptional. See Seidenfeld, *supra* note 31, at 520; Seidenfeld, *supra* note 32, at 514-15.

³⁹ See Martin Shapiro, *Administrative Discretion: The Next Stage*, 92 YALE L.J. 1487, 1507 (1983). See also Breyer, *supra* note 8, at 388-90; Cross, *supra* note 38, at 1054-55; Mashaw & Harfst, *supra* note 8, at 277; McGarity, *supra* note 13, at 1328-29; McGarity, *Deossifying*, *supra* note 8, at 1452; Pierce, *Seven Ways*, *supra* note 38, at 69-70; William H. Rodgers, Jr., *Judicial Review of Risk Assessments: The Role of Decision Theory in Unscrambling the Benzene Decision*, 11 ENV'T L. 301, 309 (1981); Shapiro, *supra* note 8, at 467; SHAPIRO, *supra* note 38, at 155.

⁴⁰ McGarity, *Ossification*, *supra* note 8, at 550.

and other analytical methodologies necessary to perform the function that Congress had delegated to EPA. The judges, in short, lacked the breadth and depth of expertise necessary to support such confident assertions about how the agency should go about its assigned business. And they almost certainly got it wrong.”⁴¹ Professor McGarity’s assessment of the Eleventh Circuit’s opinion in *AFL-CIO* is similar: A panel of inexperienced judges imposed expensive and unjustified analytical and evidentiary requirements on an agency that had acted both lawfully and reasonably.⁴²

In short, the critics claim that the sorts of things that judges look for in hard look review do not actually have much relationship to the substantive effects of the regulation under review. If the critics are right about this, then hard look review may fail to serve its intended purpose. Furthermore, many critics contend that aggressive hard look review is worse than pointless. Even if in most cases clever lawyers and other agency staffers can construct a satisfactory post hoc rationalization for whatever decision the agency reached, this exercise consumes substantial agency resources. Therefore, argue critics of hard look review, judicially-imposed explanatory requirements make government action more expensive and therefore make it harder for expert agencies to carry out their assigned tasks.⁴³ It may at first seem odd to imagine that the requirement that an administrative agency supply a plausible explanation for its decision would entail more than trivial costs—at least if the agency had done its job properly. But many scholars who have studied the practice of hard look review have concluded that the task of “assimilating the record and drafting the preambles to proposed and final rules” requires a “Herculean effort” and “may well be the most time-consuming aspect of informal rulemaking.”⁴⁴ Sometimes, these costs derive from the fact that the reviewing court demands that the agency conduct additional studies. In *AFL-CIO*, for example, the Eleventh Circuit made clear that OSHA would have to provide detailed additional evidence on hundreds of chemicals, even though the informational benefit of this additional research may have been marginal.⁴⁵ Even when the court requests additional analysis and explanation rather than additional evidence, the burdens on the agency can be significant in light of the fact that “these additional analytical requirements invite abuse by regulates who hire

⁴¹ *Id.*, at 547.

⁴² *Id.*, at 550-52.

⁴³ See John S. Applegate, *Worst Things First: Risk, Information, and Regulatory Structure in Toxic Substances Control*, 9 YALE J. ON REG. 277, 286-87 (1992); STEPHEN BREYER, *BREAKING THE VICIOUS CIRCLE* 58 (1993); Breyer, *supra* note 8, at 383, 391-93; Cross, *supra* note 38, at 1020-24; Frank B. Cross, *Shattering the Fragile Case for Judicial Review of Rulemaking*, 85 VA. L. REV. 1243, 1280-81 (1999); Mashaw & Harfst, *supra* note 8, at 284-89, 294, 297-98; McGarity, *Ossification*, *supra* note 8, at 535-36; McGarity, *Deossifying*, *supra* note 8, at 1391, 1400-01, 1412-20; Richard J. Pierce, Jr., *Judicial Review of Agency Actions in a Period of Diminishing Agency Resources*, 49 ADMIN. L. REV. 61, 71 (1997); Pierce, *Seven Ways*, *supra* note 38, at 67; Pierce, *Unintended Effects*, *supra* note 38, at 27; SHAPIRO, *supra* note 38, at 152; Sidney A. Shapiro, *Substantive Reform, Judicial Review, and Agency Resources: OSHA as a Case Study*, 49 ADMIN. L. REV. 645, 652-54 (1997); JAMES Q. WILSON, *BUREAUCRACY* 283 (1989). *But see* Rossi, *supra* note 33, at 808-11 (suggesting that impediments to agency policymaking created by hard look review have the beneficial effect of encouraging groups to seek comprehensive legislative solutions).

⁴⁴ McGarity, *Deossifying*, *supra* note 8, at 1401. See also Richard J. Pierce, Jr., *Unruly Judicial Review of Rulemaking*, NAT. RESOURCES & ENV'T, Fall 1990, at 23, 23.

⁴⁵ See McGarity, *Ossification*, *supra* note 8, at 550-52.

consultants and lawyers to pick apart the agencies' preambles and background documents and launch blunderbuss attacks on every detail of the legal and technical bases for the agencies' rules.... [T]he agencies cannot afford to allow any of the multifaceted attacks to go unanswered for fear that courts will remand...."⁴⁶ Moreover, critics charge that hard look review also may give judges an excuse to strike down policies they dislike on substantive grounds.⁴⁷ Again, Professor McGarity puts the claim succinctly: "To advocate hard look review in the context of the courts' prescriptive substantive review function is really to advocate greater discretion on the part of judges to substitute their views of appropriate statutory policies and analytical methodologies for those of the agency. In the hands of unsympathetic judges like the author of the *Corrosion Proof Fittings* opinion, this is a license to destroy regulatory programs."⁴⁸ For these reasons, critics argue that hard look review imposes substantial costs on agencies and provides few legitimate benefits to reviewing courts.

The polar positions just described are something of a caricature. Most scholars involved in the debates over the merits of hard look review articulate more nuanced views of the effects hard look review and about the proper balance between competing values at stake in defining the appropriate standard of review under §706 and analogous statutory provisions.⁴⁹ That said, it remains the case that most participants in these debates can be divided between those who think hard look review is helpful to courts and not too costly for agencies⁵⁰ and those who think that hard look review conveys little useful information to courts but imposes substantial costs on agencies that distort their policy choices. Understanding hard look review in costly signaling terms suggests a different perspective on this debate. Let us assume, for purposes of developing the signaling argument, that the critics are correct that judges generally cannot assess the merits of an expert agency's explanation for its decision, and that agency staffers can usually prepare a plausible-sounding post hoc rationale for whatever decision the agency has made. Let us also assume that the critics are correct that preparing such a record for judicial review can be quite expensive for the agency. It is precisely this latter characteristic of hard look

⁴⁶ McGarity, *Deossifying*, *supra* note 8, at 1400.

⁴⁷ McGarity, *Ossification*, *supra* note 8, at 539, 549; Richard J. Pierce, Jr., *Legislative Reform of Judicial Review of Agency Actions*, 44 DUKE L.J. 1110, 1110-11, 1120 (1995); Pierce, *Unintended Effects*, *supra* note 38, at 28; Rodgers, *supra* note 39, at 302.

⁴⁸ McGarity, *Ossification*, *supra* note 8, at 549.

⁴⁹ For example, Professor McGarity, one of the most ardent critics of hard look review as currently practiced, acknowledges that hard look review does reduce the potential for agencies to act irrationally, *see* McGarity, *Deossifying*, *supra* note 8, at 1451-52, while Professor Seidenfeld, generally a defender of hard look review, acknowledges its potential problems, *see* Seidenfeld, *supra* note 31, at 489, 520; Seidenfeld, *supra* note 32, at 514-15. Professor Sunstein has attempted to analyze and weigh the costs and the benefits of hard look review, as well as other forms of judicial review of agency action. *See* Sunstein, *Costs and Benefits*, *supra* note 31.

⁵⁰ The claim that hard look review is "not too costly" can actually be disaggregated into two separate claims. First, some commentators suggest that the "reasoned decision-making" requirement of hard look review is not that hard for agencies to meet. *See, e.g.,* Peter L. Strauss, *The Rulemaking Continuum*, 41 DUKE L.J. 1463, 1470-71 (1992); Wald, *supra* note 37, at 666. Second, commentators have also argued that, in those cases where meeting the demands of hard look review may be quite costly, those costs may be justified by the benefits that this standard of review confers. *See, e.g.,* Strauss, *supra*, at 1471.

review that may make it more useful to reviewing courts than most hard look critics or proponents appreciate. Because the provision of a high-quality explanation is costly to the agency – consuming time, money, and staff that could have been devoted to other things – the quality of the agency’s defense of its regulatory decision provides a signal of the benefits the agency expects to receive if the court upholds the regulation. The quality of the agency’s explanation therefore provides valuable information to the court even if the court cannot understand or verify any of the agency’s substantive analysis. The result, in many cases, will be what looks like hard look review: judicial demand for, and agency supply of, elaborate explanations and justifications for agency regulations. The information content of these explanations, however, may often be contained in the (expensive) style rather than the (incomprehensible) substance.

B. *The Logic of Costly Signaling*

To illustrate the logic of the theory in greater detail, consider a stylized hypothetical example in which OSHA is considering whether to set a restrictive exposure limit for a previously unregulated workplace pollutant.⁵¹ If OSHA declines to adopt the regulation, the courts will not have any occasion to evaluate OSHA’s decision.⁵² If OSHA does adopt the regulation, affected industry groups will sue, in which case a federal court will have to rule on whether OSHA’s decision to impose the regulation was supported by substantial evidence.⁵³ The reviewing court has two problems. The first is an *asymmetric information* problem: OSHA is likely to know much more than the court about the actual effect of the regulation, so it is difficult for the court to assess the accuracy of OSHA’s claims regarding the net benefits of the regulation. The second

⁵¹ OSHA regulations are frequent targets of a version of hard look judicial review. See, e.g., *American Textile Mfrs. Institute v. Donovan*, 452 U.S. 490 (1981); *Industrial Union Dep’t, AFL-CIO v. American Petroleum Institute*, 448 U.S. 607 (1980); *Color Pigments Mfrs. Ass’n, Inc. v. OSHA*, 16 F.3d 1157 (11th Cir. 1994); *American Dental Ass’n v. Martin*, 984 F.2d 823 (7th Cir. 1993); *AFL-CIO v. OSHA*, 965 F.2d 962 (11th Cir. 1992); *American Iron & Steel Institute v. OSHA*, 939 F.2d 975 (D.C. Cir. 1991); *Building & Construction Trades Dept., AFL-CIO v. Brock*, 838 F.2d 1258 (D.C. Cir. 1988); *Public Citizen Health Research Group v. Tyson*, 796 F.2d 1479 (D.C. Cir. 1986); *Forging Industry Ass’n v. Secretary of Labor*, 773 F.2d 1436 (4th Cir. 1985); *ARASCO, Inc. v. OSHA*, 746 F.2d 483 (1984).

⁵² This assumption neglects the possibility that interested parties can sue to compel OSHA to adopt a rule. So-called “action-forcing” suits are permitted under the APA, 5 U.S.C. §551(13) (defining “agency action” as including “failure to act”); §706(1) (empowering reviewing courts to compel agency action “unlawfully withheld or unreasonably delayed”). However, judicial review of agency decisions not to initiate rulemaking is “extremely limited and highly deferential,” *Nat’l Customs Brokers & Forwarders Ass’n of America v. United States*, 883 F.2d 93, 96 (D.C. Cir. 1989); see also *WWHT, Inc. v. FCC*, 656 F.2d 807, 818 (D.C. Cir. 1981), and some courts have described review of agency refusal to initiate rulemaking as involving a degree of deference “so broad as to make the process akin to non-reviewability,” *Cellnet Comm., Inc. v. FCC*, 965 F.2d 1106, 1111 (D.C. Cir. 1992). There are, however, exceptions to this general principle, including some in the OSHA context I use as the basis for my stylized hypothetical example. See, e.g. *Public Citizen Health Research Group v. Chao*, 314 F.3d 143, 151-59 (3d Cir. 2002); *Public Citizen Health Research Group v. Tyson*, 796 F.2d 1479, 1505-07 (D.C. Cir. 1986).

⁵³ As noted earlier, the standard of review under the Occupational Safety and Health Act is “substantial evidence” rather than “arbitrary and capricious,” but this difference is not important for purposes of the analysis in this Article. See *supra* note 18.

problem is a *divergent preferences* problem: OSHA and the court may disagree on the conditions under which enacting this regulation would be rational. Suppose, for instance, that the regulation would impose \$100 million in annual costs on the national economy. OSHA might be willing to adopt this regulation if it saved at least five lives per year (consistent with a statistical life valuation of \$20 million), but the court might view the regulation as rational only if it would save at least ten lives per year (consistent with a statistical life valuation of \$10 million). As a formal doctrinal matter, it may be that the reviewing court is not supposed to evaluate an OSHA decision in this sort of cost-benefit framework.⁵⁴ Be that as it may, the assumption here is that judges have policy preferences, those preferences can be described in cost-benefit terms, and these preferences influence judicial assessments of whether an agency decision is adequately justified.

Let us refer proposed regulation's impact on salient outcome variables as the *payoff* of the regulation.⁵⁵ In the OSHA hypothetical, we might imagine that the payoff is the annual number of deaths the regulation will prevent.⁵⁶ A smart layperson like a federal judge can get a rough sense, from readily available and easy-to-interpret sources, of the probability that the payoff is large, small, or somewhere in between.⁵⁷ From this, the judge will make an estimate of the true payoff, though this estimate is likely to be highly uncertain. Call this estimate the *expected payoff*.⁵⁸ In contrast to the court, the agency has specialized expertise. For simplicity, assume that the agency's expertise allows it to learn the true payoff (the number of lives the regulation will save) with certainty before deciding whether to regulate.⁵⁹ This assumption exaggerates the extent of agency

⁵⁴ See *American Textile Mfrs. Institute*, 452 U.S. at 490 at 507-22.

⁵⁵ In the formal model described, the *payoff* is the b parameter. See Appendix, *infra*.

⁵⁶ Of course, the impact of any real regulation will include other factors, including economic cost, distributional impact, and so forth. To simplify the discussion, we can assume that these other effects are known with certainty. This assumption is unrealistic but benign. The analysis would be the same if, for example, both the number of lives saved and the economic costs were unknown. In that case, the unknown quantity of interest could be characterized as the ratio of cost-per-life saved. The same approach could be used to incorporate an arbitrarily large number of benefits and costs, as long as all these variables can be expressed in reduced form as a level of utility to both the agency and the court.

⁵⁷ In the formal model, the payoff is drawn from a probability distribution with cumulative distribution function F . See Appendix, *infra*. Though the subsequent numerical examples use a simple uniform distribution, the argument does not depend on that type of distribution, as the Appendix demonstrates.

⁵⁸ In the formal model, the *expected payoff* is the μ parameter. See Appendix, *infra*. Note that in the model μ is defined not as $E(b)$, but as $E(b-k(b))$, where $k(b)$ is an "ignorance penalty" that reflects the fact that uninformed agencies may regulate less efficiently than informed agencies. See Part II.B, *infra*. In the simple version of the analysis discussed here, however, we assume that there is no ignorance penalty (i.e., $k(b)=0$ for all b), so in this case $\mu=E(b)$.

⁵⁹ In the formal model, the parameter $\theta \in \{0,1\}$ captures whether or not the agency is informed, and the parameter p is the probability that the agency is informed (i.e., that $\theta=1$). The situation described in the main text, in which the agency is always informed, corresponds to the special case where $p=1$. See Appendix, *infra*.

expertise, but it simplifies and clarifies the exposition of both the asymmetric information problem and how hard look review might mitigate that problem.⁶⁰

To incorporate the divergent preferences problem, assume that both the court and the agency have a *rationality threshold*;⁶¹ each decision-maker views regulation as rational only if the payoff exceeds the decision-maker's rationality threshold. Another way to think about this is to imagine that a decision-maker's utility from regulation is equal to the regulation's payoff minus the decision-maker's rationality threshold. The preference divergence between the agency and the court is thus captured by the difference in their rationality thresholds.⁶²

If the court's rationality threshold is below the agency's – that is, if the agency tends to be more skeptical than the court of the type of regulation under consideration – then the court's best strategy will be to uphold the agency's decision to regulate, because any regulation that is good enough for the agency would also be good enough for the court. In these cases, we would expect consistent patterns of judicial deference to agency decisions, with only cursory scrutiny of the agencies' explanations for those decisions. Agencies, anticipating such mild scrutiny, will not invest substantial resources in preparing elaborate records. But what if the court's rationality threshold is higher than the agency's? In this case, there are at least some regulations that the agency would prefer to enact that the court, if fully informed, would view as irrational. In this case, how does the court decide whether to uphold an agency regulation?

At the moment the court must decide whether or not to uphold the agency's regulation, the court has acquired two additional valuable pieces of information that help it make this decision. First, the simple fact that the agency has regulated signals that the payoff exceeds the agency's rationality threshold. This can sometimes be sufficient to persuade a court to uphold a regulation that the court would have invalidated if the court had to pass on the regulation in the first instance. This suggests an instrumental account

⁶⁰ Part II, *infra*, explores an extension in which the agency may not learn the true payoff before deciding whether to regulate.

⁶¹ In the formal model, the agency's *rationality threshold* is normalized to 0 and the court's rationality threshold is the parameter $j+\varepsilon$, where j is a constant and ε is a random variable with mean 0. Because the court does not observe ε , the court's decision will be based on its expected rationality threshold, $E(j+\varepsilon)=j$. The textual references to the court's rationality threshold actually refer to this expected rationality threshold, j . See Appendix, *infra*.

⁶² The analysis assumes that the agency and the court know one another's rationality thresholds. This assumption may be problematic in some cases, but it may be justifiable when considering decision-makers who interact on a regular basis and know something about one another's political, philosophical, and professional backgrounds. Our ability to describe regulatory decision-makers using terms like "extremely conservative," "moderately liberal," etc. suggests an ability to estimate regulatory preferences on a continuum. An interesting direction for future research might be to take the basic framework for analysis laid out in this Article and incorporate mutual uncertainty about preferences, as has been done, for example, in the political science literature on elections and legislative behavior. See, e.g., Randall L. Calvert, *Robustness of the Multidimensional Voting Model: Candidate Motivations, Uncertainty, and Convergence*, 29 AM. J. POL. SCI. 69 (1985) (analyzing electoral models in which candidates may be uncertain about voter preferences); Richard D. McKelvey & Peter C. Ordeshook, *Information, Electoral Equilibria, and the Democratic Ideal*, 48 J. POL. 909 (1986) (analyzing electoral models in which voters may be uncertain about candidate preferences).

for judicial deference to agency expertise that is consistent with the strong assumption that judges are outcome-oriented.⁶³ Second, the court can use the quality of the agency's explanation for its decision to estimate the cost involved in providing this explanation, and the court can infer that the payoff of regulation must exceed the sum of the agency's rationality threshold and this explanation cost. The result is a pattern of behavior consistent with hard look review: Agencies anticipate and attempt to satisfy judicial demands for detailed explanations of policy choices, even though the reviewing courts are not competent to assess whether these explanations are correct.

1. The Decision to Regulate: An Instrumental Explanation of Deference Norms

Before examining how judicial assessment of the quality of an agency record can influence the court's decision whether to uphold an agency's regulation, consider first the case where the agency cannot or does not provide any additional explanation for its action. Even in this case, the agency's decision to regulate can convince an otherwise skeptical court to uphold a regulation. Imagine a regulation with an expected payoff below the court's rationality threshold. If the court were asked to consider this regulation in the first instance, it would reject it. But if the same regulation is enacted by an informed agency, the court can infer that the true payoff is greater than the agency's rationality threshold. Otherwise, the agency's decision to regulate would be irrational.⁶⁴ This additional information enables the court to adjust upward its estimate of the payoff. This adjusted payoff estimate may exceed the court's rationality threshold even if the ex ante expected payoff did not. If so, the court will uphold a regulation enacted by an informed agency that the court would otherwise have viewed as irrational.

To illustrate in the context of the OSHA example, suppose that a proposed regulation will save some number of lives between zero and 20, with any number in that range equally likely. The court's expected payoff is therefore 10 lives. Assume that the court's rationality threshold is 12 lives, while OSHA's is six lives. The expected payoff is below the court's rationality threshold, meaning that the court initially views this regulation as irrational. But, if OSHA enacts the regulation, the court can rule out the possibility that the regulation will save fewer than six lives. This means the true payoff must be between

⁶³ To be clear, I do not mean to endorse the proposition that judges are concerned primarily about policy outcomes, a hypothesis about which there is substantial empirical controversy. That said, there is considerable empirical evidence that judges are at least influenced (perhaps subconsciously) by policy considerations. Furthermore, it is useful to show how patterns of judicial behavior thought to be inconsistent with outcome-oriented judging, such as deference to other branches of government, can be shown to arise as instrumentally rational behavior even when one makes the strong assumption that judges are concerned exclusively about outcomes rather than legal process or role constraints. Cf. Ethan Bueno de Mesquita & Matthew C. Stephenson, *Informative Precedent and Intrajudicial Communication*, 96 AMER. POL. SCI. REV. 755 (2002) (showing how the norm of stare decisis can arise even in a model that makes the strong assumption that judges are purely outcome-oriented).

⁶⁴ If the payoff is less than the agency's rationality threshold, then if the agency succeeds in getting the regulation past the courts, the agency would suffer a net loss. If the regulation is struck down, then the agency is no better off than it would have been if it decided not to regulate in the first place. In this situation, I assume that the agency would choose not to regulate.

six and 20. Because any payoff in this range is equally likely, the court's updated estimate of the true payoff of the regulation is 13. This is above the court's rationality threshold, so the court would uphold the regulation.⁶⁵

This pattern of judicial behavior – upholding a regulation enacted by an informed agency that the court would otherwise oppose – might be characterized as reluctance by a reviewing court to “substitute its judgment for that of the agency.”⁶⁶ It is important to stress, however, that this judicial “deference” is not indicative of judicial reluctance to focus on outcomes rather than process, or to decide cases according to the judges' own views of sound policy. A judge may have an incentive to describe a decision to uphold an agency's regulation in terms of respect, restraint, and the like. The above analysis suggests that judicial deference to agency expertise may also be a rational, instrumental response to the asymmetric information problem in circumstances where the court's preferences are positively but imperfectly correlated with those of the agency.

2. *The Quality of the Record: A Costly Signaling Explanation of Hard Look Review*

Hard look review calls for courts to engage in “searching and careful” scrutiny of the agency record for evidence of “consideration of the relevant factors,” “examin[ation of] the relevant data,” and “articulat[ion of] a satisfactory explanation” for the agency's action.⁶⁷ This approach is exemplified both by cases like *Sierra Club* and *United Steelworkers*, in which the reviewing court upholds an agency's conclusion only after extensive scrutiny of the rulemaking record, as well as cases like *Corrosion Proof Fittings* and *AFL-CIO*, in which the reviewing court vacates and remands for further analysis and evidentiary support. What does this sort of hard look review accomplish? One possibility, of course, is that it facilitates the court's efforts to learn what the agency knows about the true payoff of the regulation, or at least to verify, by scrutinizing the agency's supporting evidence and analysis, that the agency's conclusion that the regulation is substantially justified. This may be the case in some circumstances, though critics of hard look review have presented reasons for doubt. Another possibility is that is that judicial scrutiny of the record is an elaborate charade in which courts find justifications for making the decisions they would have made anyway. This more cynical hypothesis may also hold true in some instances, though it is hard to believe that judges would be so cavalier given their lack of relevant expertise.

This Article advances another possibility: the quality of the agency's explanation and justification for its decision – a variable I will refer to as *record quality* – can act as a costly signal to the court of the agency's information about the true payoff.⁶⁸ That is,

⁶⁵ This is not to say that the court knows with certainty that the regulation is a good idea from the court's perspective. It may be, for example, that the true payoff in this example was seven lives.

⁶⁶ *Motor Vehicle Mfrs. Ass'n v. State Farm Mut. Auto. Ins. Co.*, 463 U.S. 29, 43 (1983).

⁶⁷ See *Overton Park*, 401 U.S., at 416; *State Farm*, 463 U.S., at 43.

⁶⁸ In the formal model, *record quality* is parameter s , and the cost to the agency of generating record quality is given by parameter x . See Appendix, *infra*. It is worth noting that the analysis assumes that the agency's selection of record quality does not change the payoff, i.e. the choice of s does not change b . While this is a reasonable assumption in most cases, there may be circumstances in which this assumption

when the reviewing court scrutinizes an the evidence and analysis marshaled by an agency in support of a proposed rule, the court may not be learning anything about the accuracy of the agency's conclusions nor observing a substantively reliable indicator of reasoned decision-making, but the court may nonetheless be learning something about the agency's willingness to invest resources into providing the kind of detailed record and lawyerly analysis that courts consider in hard look review. If so, and if the benefit of a given regulation to the agency is positively correlated with the expected benefit of that regulation to the court, then a record of sufficient quality can induce a court to uphold a regulation it would otherwise oppose, because the expensive record demonstrates that the agency places a sufficiently high value on the proposed regulation. The agency, in turn, will factor the costs of providing a sufficiently high-quality record into its decision whether or not to promulgate a regulation in the first place.

To demonstrate how the signaling argument works, and to differentiate it from other hypotheses regarding the function of hard look review, let us make the strong assumption that the judiciary is institutionally incapable of comprehending anything in the administrative record, and that the type of "reasoned decision-making" the courts can discern in agency explanations has no inherent substantive link to the quality of the agency's actual decision-making process. This assumption may strike some as too strong. Indeed, I do not believe that a court's evaluation of the substantive content of an agency's explanation is wholly unrelated to the actual quality of the agency's decision process. Nonetheless, making this strong assumption is useful for two reasons. First, it allows analytic isolation of the role that an explanation's cost, as distinct from its content, plays in influencing judicial review of agency decisions under the hard look approach. This Article argues that an explanation's cost can have an informative function that is independent of the explanation's content. It is helpful, in demonstrating this point, to assume that the explanation's content is totally useless, even if this assumption is empirically incorrect. Second, as noted above, many administrative law scholars—including several of the most influential figures in the field—have taken positions that, while not quite as extreme as the assumption I make in this Article, are in fact quite close.⁶⁹ That said, the assumption that judges are entirely incapable of assessing anything the agency says on the merits is clearly an exaggeration, and in response to this concern I later ~~related this assumption~~⁷⁰ ~~to the~~ ~~signaling theory~~ ~~assumes~~ ~~further~~ ~~that~~ ~~even~~ ~~if~~ ~~the~~ ~~type~~ ~~of~~ ~~evidence~~ ~~and~~ ~~analysis~~ ~~the~~ ~~courts~~ ~~demand~~ ~~in~~ ~~hard~~ ~~look~~ ~~review~~ ~~is~~ ~~neither~~ ~~verifiable~~ ~~by~~ ~~the~~ ~~court~~ ~~nor~~ ~~inherently~~ ~~indicative~~ ~~of~~ ~~high-quality~~ ~~agency~~ ~~decision-making~~, ~~providing~~ ~~this~~ ~~type~~ ~~of~~ ~~record~~ ~~is~~ ~~costly~~ ~~to~~ ~~the~~ ~~agency~~. Furthermore, the theory requires that this costly

does not hold. For example, suppose that generating a high quality record entails unavoidable delay, and the regulation's benefits cannot be realized without rapid action. In this case, the regulatory payoff might be negatively correlated with record quality. Or, suppose that the record-generation activity (as distinct from the fact of being informed) actually increases the quality of the regulation. In this case, the regulatory payoff might be positively correlated with record quality. Though the formal analysis does not capture either of these possibilities directly, this is not a significant problem. The basic analysis holds as long as the court can use the quality of the record to adjust its expectation of the payoff, and this updated expectation is positively correlated with record quality.

⁶⁹ See *supra* notes 38-47.

⁷⁰ See *infra* TAN 107.

effort be observable by the reviewing court. This assumption is based on the notion that, even when a judge is not able to differentiate sound analysis from skillful spinning, the agency's record will contain indications of the time and effort that went into preparing it. So, for example, the D.C. Circuit could conclude in *United Steelworkers* that OSHA's analysis of the PEL for lead was based on "voluminous"⁷¹ and "extremely detailed"⁷² evidence and "careful" measurement,⁷³ that OSHA had explained this evidence "convincingly,"⁷⁴ and that even though some of the key issues involved were "technically complex ... combining esoteric medical principles with highly theoretical mathematical analyses,"⁷⁵ nonetheless OSHA had provided adequate support for its conclusions on these points.⁷⁶ Though terms like "convincing" and "careful" do imply some assessment of the merits, the thrust of the discussion suggests that the court is responding to the overall quality of the presentation of the arguments rather than the ultimate correctness of those arguments. Similarly, the D.C. Circuit in *Sierra Club* frankly admitted the limits of its institutional competence to evaluate the substance of the record, and instead described its job as "prob[ing] the agency's rationales" and "stud[ying] its references," while generally giving the agency the benefit of the doubt on tough substantive questions.⁷⁷ Reviewing courts in these and other cases appears to have an easier time figuring out whether the agency provided a resource intensive explanation than figuring out whether this explanation is defensible on the merits.

Because the agency is rational, it would not pursue a regulation that is not worth the cost of protecting from judicial reversal. The court can therefore update its estimate of the payoff based on the agency's investment in record quality, and the court will uphold an agency action that is accompanied by a sufficiently high-quality record for the court to infer that the expected payoff is above the court's rationality threshold. The basic dynamic can be illustrated with a variation on the OSHA hypothetical. Assume, as before, that OSHA is contemplating a regulation that will save some number of lives between zero and 20. Any number in that range equally likely *ex ante*, so the expected payoff is 10. OSHA's rationality threshold is 12, but the court's rationality threshold is 18. If the agency regulates, the court can rule out the possibility that the true payoff is 12 or less. This, however, is not enough for the court to view regulation as rational: If the true payoff is between 12 and 20, the expected payoff is 16, which is still below the court's rationality threshold. But now suppose that OSHA regulates and provides the court with a detailed record explaining the decision. The court cannot assess the accuracy of the analysis in this record, but it can tell that the effort that OSHA put into compiling it was the utility equivalent, to OSHA, of saving four additional statistical

⁷¹ *United Steelworkers v. Marshall*, 647 F.2d 1189, 1248 (1980).

⁷² *Id.* at 1253.

⁷³ *Id.* at 1248.

⁷⁴ *Id.* at 1252.

⁷⁵ *Id.* at 1259.

⁷⁶ *Id.* at 1263.

⁷⁷ *Sierra Club v. Costle*, 657 F.2d 298, 410 (D.C. Cir. 1981).

lives.⁷⁸ The court can infer from this that the payoff must be at least 16 lives. Because any payoff between 16 and 20 is equally likely, the court's updated estimate of the payoff is 18, which is just high enough that the court would uphold the regulation.

The idea that an agency can place regulatory goals, like the prevention of deaths, and the resource costs associated with defending legislation on the same scale might initially seem problematic. This assumption, however, is exactly the same assumption that critics of hard look make when they posit that the costs associated with judicial review deter agencies from making certain rules, and it derives from a couple of reasonable considerations. First, the agency's private interest in achieving regulatory goals may diverge from the public interest in achieving those goals. Indeed, it is likely to do so, given that agencies, even altruistic or politically responsive agencies, are unlikely to internalize the full benefits of efficient regulation, while the resource costs of providing high-quality regulation are concentrated in the agency. Second, since agency resources are finite, devoting more resources to defending any particular regulation means fewer resources are available for pursuing other activities that the agency decision-makers or their political overseers consider valuable.

In a nutshell, the costly signaling theory of hard look judicial review postulates that when courts scrutinize agency records they are drawing inferences about the costs the agency incurred in generating the record; that these cost estimates are useful to the court because they indicate how valuable the regulation is to the agency; and that this information is helpful to the reviewing courts because judicial preferences and agency preferences, though divergent, are positively correlated in expectation. As a result, a court will uphold an agency action accompanied by a sufficiently high-quality record that the court would not uphold if the record were shoddier, even if the content of the record is not in itself particularly informative.

C. Behavioral Implications and Predictions

As a positive descriptive matter, the costly signaling theory provides an account of the practice of hard look review that does not depend on the optimistic assumption that judges can assess the merits of complex agency records nor on the cynical assumption that scrutiny of a decision-making record is a meaningless charade. This perspective further suggests a possible reconciliation of seemingly conflicting descriptive claims about hard look review. For example, many critics of hard look review claim both that elaborate agency explanations are not very informative to courts and that producing these explanations is expensive to agencies. These claims are in some tension. If judges do not learn much from agency records, and instead make uninformed decisions based on their own views of the merits, why do agencies bother to spend substantial resources on impressive looking records? A hostile court can always find some explanatory deficiency, and a sympathetic court can always deem a cursory record sufficient. While

⁷⁸ Several scholars have noted that the resource cost to agencies of developing a record sufficient to survive hard look review. See Pierce, *supra* note 43, at 71; Tiller, *supra* note 2, at 1459. See also sources cited note 43, *supra*.

there might be many ways to resolve this tension, understanding agency records in signaling terms offers a straightforward resolution: Agency explanations are persuasive *because* they are costly.

Similarly, the signaling theory provides a more satisfying account for the casual observation that uninformed judges do appear to look carefully at agency records, and aggrieved litigants do their best to point out flaws, inconsistencies, and omissions in those records. Critics have argued persuasively that agency records often do not reflect actual decision-making processes and that courts are ill-equipped to evaluate either the records or the litigant critiques. If the benefits of hard look review are understood in terms of its efficacy in identifying flawed agency reasoning, the critics' objections have substantial bite. But if judicial scrutiny of the record is understood as an effort by judges to ascertain how much effort the agency devoted to preparing a defense of a regulation, it is not necessarily undermined by the claim that agency records do not reflect the actual decision-making process or by the claim that courts cannot understand them.

The signaling theory also provides an alternative perspective on the claim that aggressive hard look review leads to the "ossification" of agency rulemaking because of the decision costs it imposes on agencies. Critics of hard look review often portray ossification as the unintended consequence of aggressive review by well-meaning but shortsighted judges.⁷⁹ But if the generation of a record is a form of costly signaling, then ossification, understood as the deterrence of rulemaking in cases where the agency views the judicially-imposed explanation costs as greater than the rule's expected net benefits, may be precisely what hard look review is supposed to accomplish.⁸⁰ Courts cannot assess regulatory benefits directly, so they establish a type of review under which it is too expensive for agencies to enact regulations that have low value to the agency and negative expected value to the courts. Ossification, on this view, need not be the result of an individual or collective failure of judicial rationality or foresight. Instead, ossification may be the pejorative name assigned to the effective screening out by judges of regulations that are sufficiently low-value that they would be considered irrational, and therefore unlawful, by a fully informed reviewing court.

The costly signaling argument also provides a fuller theoretical account for the common claim that "whether the court will dig deeply or bow cursorily depends ... on whether the judge agrees with the result of the administrative decision."⁸¹ When the agency is more skeptical of the type of regulation at issue than the court is, the agency need not make any substantial investment in record quality. Even in cases where the court is somewhat more skeptical of regulation than the agency, the simple fact that the informed agency decided to regulate is sometimes enough to convince the court that the

⁷⁹ See, e.g. Mashaw & Harfst, *supra* note 8; Pierce, *Unintended Effects*, *supra* note 38.

⁸⁰ One important complication, not pursued further here, is that the agency may respond to the costs of hard look review by making policy in other ways that are more difficult for the courts to police. See Mashaw & Harfst, *supra* note 8; James T. Hamilton & Christopher H. Schroeder, *Strategic Regulators and the Choice of Rulemaking Procedures: The Selection of Formal vs. Informal Rules in Regulating Hazardous Waste*, 57 L. & CONTEMPORARY PROBS. 111 (1994).

⁸¹ Rodgers, *supra* note 39, at 302.

expected benefit of regulation is positive.⁸² But, as the court becomes more skeptical than the agency of regulation – that is, as the court’s rationality threshold becomes higher relative to the agency’s – then the record quality required by the court to uphold regulation goes up.⁸³ The need to provide a higher quality record will, in turn, cause the agency not to regulate in some cases where it otherwise would have. Greater judicial skepticism of regulation therefore generally leads to better records, less agency action, and greater average expected benefits for the actions that the agency does undertake.

Greater judicial hostility toward a particular type of regulation, however, need not lead to any noticeable change in the rate at which courts strike down agency decisions. Indeed, if the agency and court are both perfectly rational and perfectly informed, no agency action would ever be struck down unless the agency for some reason wanted to be reversed. In the real world, courts do invalidate some agency actions, though recent studies suggest that courts rarely remand significant agency rules in a way that interferes substantially with the agency’s ability from achieving its main regulatory goals.⁸⁴ The existence of some number of reversals in the real world may be attributable to the fact that agencies are uncertain about the preferences of the reviewing court, or to imprecision in judicial estimates of the agency effort (in utility terms) that went into any given record. When information is incomplete, even perfectly rational agencies may adopt a strategy that results in some number of reversals. There is no necessary reason, however, for reversals to go up as the court becomes more hostile to regulation.

One other potentially interesting empirical implication of the costly signaling account is worth noting. It may that some agencies are better at producing high-quality records than other agencies are. If record quality is valuable insofar as it provides evidence of the cost incurred by the agency, then agencies capable of producing high quality records at lower marginal cost – for example, agencies with a large staffs of highly skilled lawyers and other professionals, or agencies with lower opportunity costs – will have to produce higher quality records to survive judicial review than will agencies that find producing high-quality records more difficult. This observation implies that agencies do not realize a long-term benefit from improvements in their capacity to generate high-quality records. As an agency becomes better at crafting high-quality records, it will have to produce an even more impressive record in order to signal to the court that it invested substantial resources in preparing that record.⁸⁵ The agency is advantaged by improvements in

⁸² See *supra* Part I.B.1.

⁸³ The formal version of this result is given in Remark 1. See Appendix, *infra*.

⁸⁴ See Jordan, *supra* note 14, at 395-98; Patricia M. Wald, *Regulation at Risk: Are Courts Part of the Solution or Most of the Problem?*, 67 S. CAL. L. REV. 621, 634-39 (1994). Because these studies only look at cases where a court remanded an agency regulation, they do not undermine the claim that the costs associated with judicial review may deter or delay agency action. See Jordan, *supra*, at 395 (acknowledging that his findings do not disprove the claim that “hard look review results in excessive data gathering, analysis, and long winded explanations, often of marginal points, all of which imposes unnecessary costs and delays upon the agencies’ regulatory programs”).

⁸⁵ This would be consistent with the view, apparently held by at least some judges, that less is expected of agencies that face severe resource limitations. See Pierce, *supra* note 43, at 74 (discussing Judge Easterbrook’s dissenting opinion in *Salameda v. INS*, 70 F.3d 447, 452-53 (7th Cir. 1995)). Other judges

capacity to generate record quality only until the court realizes that the agency's capacity has improved; such improvements will not produce any sustained increase in the agency's ability to get regulation upheld by the courts, even though the quality of the records the agency produces will improve.⁸⁶ This hypothesis contrasts with what one would expect if high-quality records are useful because they communicate substantive information to the reviewing court. If that were the case, then greater capacity to generate high-quality records would mean that the agency can reduce its spending on record quality without altering the quality of the end product.

D. Objections

The costly signaling argument advanced in this Article is neither universally applicable nor exclusive of other possible functions of hard look review. For instance, though the preceding analysis isolated the signaling function of hard look review by assuming courts could not learn anything useful from the content of agency records, it is possible – indeed, it is likely – that agency records may sometimes convey some accurate substantive information about a regulation's likely impact. Even with this caveat, though, the costly signaling account of hard look review is subject to at least three serious objections. The first is that the argument's two key assumptions – that there is a positive correlation between the expected benefit of regulation to the court and the benefit of regulation to the agency, and that the court can use record quality as a signal of the agency's willingness to incur costs – are substantively implausible. The second objection is that the costly signaling account is inconsistent with how judges and agency personnel understand and describe the function and effect of hard look review. The third objection is that the costly signaling argument does not explain why the agency would signal to the court by preparing a high quality record rather than by incurring costs in some other way. While these criticisms are well-taken, they do not undermine the theoretical or empirical plausibility of appropriately modest versions of the theory.

1. Plausibility of the assumptions

As noted at the outset, the costly signaling explanation for hard look review has purchase only when the expected benefit of regulation to the court is positively correlated with the benefit of regulation to the agency, and when the court can use record quality to make reasonably accurate inferences about agency expenditures on record preparation. Both of these assumptions might be attacked on substantive grounds.

Consider first the assumption that the expected benefit of a policy to the reviewing court is positively correlated with the benefit of the policy to the agency. This

reject that suggestion, *see Salameda*, 70 F.3d, at 449, though something like this consideration might still affect judges' assessments of agency explanations tacitly or subconsciously.

⁸⁶ An additional implication of this is that agencies have an incentive to try to convince courts that they face serious institutional difficulties in providing the courts with high-quality records for review. The more it appears that an agency is afflicted with serious staff, budget, and other limitations, the less the agency needs to provide in terms of record quality in order to survive judicial review.

assumption is important because the costly signaling argument is built around the idea that the more the agency cares about enacting a regulation, the more likely it is that the court, if fully informed, would be willing to uphold it. As demonstrated above, this condition does not require that the government and the court have identical preferences; indeed, if preferences are identical, signaling is unnecessary. The positive correlation assumption is valid as long as the government and the court share the same basic objectives (e.g., safety, security, productivity, efficiency, equity) even if they disagree intensely on the relative importance of these values and about how they should be traded off when they conflict. That sort of disagreement is captured in the difference between the respective rationality thresholds of the agency and the court. But what if the agency cares about advancing policy goals that the court deems irrelevant, or vice versa? Suppose, for example, that the phenomenon of agency “capture” by regulated entities leads an agency to value certain goals – say, the protection of incumbent firms from entry – that the courts do not think are valid considerations when deciding whether a regulation is rational.⁸⁷ If one believes that this or similar phenomena are widespread, does that mean that the costly signaling argument is generally inapplicable?

The answer is yes in extreme cases but otherwise no. If the agency cares exclusively about factors deemed irrelevant by the court, then the positive correlation assumption would not hold and the agency could not influence the court’s decision by spending resources on record quality. But if one assumes, more plausibly, that the agency shares at least some goals with the court, then the positive correlation assumption will hold even if the agency also cares about objectives the court deems irrelevant. In cases where the court and the agency have the same information about the factor the court deems irrelevant, then the divergence between the court’s goals and the agency’s goals is captured by the difference in their rationality thresholds. Even if the agency is better informed about this factor, then the positive correlation assumption will continue to hold: Though the agency’s interest in other goals introduces more “noise” into the signal it sends to the reviewing court, it remains the case that the expected payoff to the court is higher if the payoff to the agency is higher.⁸⁸ There is no guarantee, of course, that a high payoff to the agency means a high payoff to the court. It may be that the high payoff to the agency is exclusively or primarily due to factors the court views as irrelevant. But all that the signaling argument requires is that, in expectation, a high payoff to the agency is more likely to mean a high payoff to the court.

A simple variant on the OSHA example may help illustrate this point. Suppose that the court cares only about lives saved, but that OSHA cares about two things: the number of statistical lives the regulation will save and the political benefits from adopting the regulation that are independent of its life-saving effects. This latter benefit might arise, for example, because the regulation might have some symbolic value to the agency or its political principals, or because regulatory burdens will fall disproportionately on the

⁸⁷ See William A. Niskanen, *Bureaucracy and Representative Government* (1971); George J. Stigler, *The Theory of Economic Regulation*, 5 *BELL J. ECON. & MGMT. SCI.* 3 (1971). *But see* Steven P. Croley, *Public Interested Regulation*, 28 *FLA. ST. U. L. REV.* 7 (2000).

⁸⁸ This result is captured in the formal model through the inclusion of the ε parameter in the court’s utility function. *See* Appendix, *infra*.

current administration's political opponents. The court cares about lives saved but not about these other political considerations. In this example, let us assume that the number of lives the regulation will save is equally likely *ex ante* to be any number between zero and 20, and the political benefit of the regulation to the agency will have some value that can be expressed, in life-equivalent terms, as some number between zero and 20, with any value in this range equally likely *ex ante*. Thus, the expected payoff of the regulation to OSHA is 20, but the expected payoff of the regulation to the court is 10. Now suppose further that OSHA's rationality threshold is 10; that the court's rationality threshold is 15; and that OSHA but not the court becomes informed as to both the number of lives saved and the political value of the regulation. If OSHA regulates without investing anything in record quality, the court can infer that the payoff of the regulation to OSHA was between 10 and 40. The court's estimate of the expected payoff of the regulation to OSHA is therefore 25. The court knows that the both the number of lives saved and the political benefits are between 5 and 20, and each has an expected value of 12.5. Because the *ex post* expected number of lives saved (12.5) is below the court's rationality threshold (15), the court would not uphold the regulation.

But suppose that OSHA in this example regulates and spends the utility equivalent of 10 statistical lives on record quality. In this case, the court can conclude that the payoff to OSHA was at least 20, so the court can infer that the expected payoff of the regulation to OSHA is 30. That means the expected payoff to the court, *i.e.* the expected number of lives saved, is 15. This is equal to the court's rationality threshold, so the court would be willing to uphold the regulation. Of course, the court does not know for certain that the regulation will actually save 15 lives. In fact, it is possible that OSHA learned that the regulation would save zero lives but would confer a political benefit worth 20 lives to the agency. If that turns out to be the case, then the court's payoff would be zero, well below its rationality threshold of 10. Nonetheless, the court's *expected* payoff is 15, so it would rationally uphold the regulation. More generally, in this example the agency's payoff is positively correlated with the court's expected payoff, so the court will be willing to uphold an agency regulation if the agency spends enough on record quality, even in a case where the court knows that the agency is also motivated by concerns that the court would view as irrelevant.

Then costly signaling theory's second key assumption is that courts can make relatively good estimates of the cost, in utility terms, that the government invested in producing an explanation for its decision. This assumption is vulnerable to two substantive attacks. First, some might argue that the cost to an administrative agency of producing an impressive record is so trivial that it can never function as an effective signal. That claim runs counter to the widespread belief that satisfactory compliance with judicially-imposed explanatory requirements entails substantial costs⁸⁹ This is ultimately an empirical dispute, and its resolution is beyond the scope of the present Article. The second point of vulnerability for this assumption concerns the plausibility of the notion that judges can infer the cost incurred by the agency from the quality of the record. The

⁸⁹ See *supra* sources cited note 43. This belief, however, is not universally accepted. See *supra* note 50.

idea that judges can infer the exact cost incurred by the agency is, of course, absurd. But the argument does not require such extreme precision. It is reasonable to suppose that a judge can tell the difference between a record that was the product of thousands of hours of work by dozens of skilled personnel and one that was slapped together in a couple of days by some interns, even if the judge acquires no better understanding of the technical or factual bases for decision from the former type of record than from the latter. It is likewise reasonable to suppose that judges recognize, intuitively if not consciously, that it is expensive for government decision-makers to produce impressive-looking records. That said, the efficiency of record quality as a signal degrades as judges' ability to draw inferences about the costs associated with record quality worsens.

To be clear, the plausibility of the costly signaling explanation for hard look review, as with any positive theory of this type, depends on the plausibility of the underlying assumptions. If the fact that an administrative agency cares intensely about enacting a particular regulation does not cause a court to adjust upward the court's estimate of the regulation's benefits, then the agency cannot improve its chances of surviving judicial review by employing a signaling mechanism of the sort discussed in this Article. Similarly, if the court cannot draw inferences about the costs the agency incurred from the quality of the record, then record quality cannot function as a useful signal. The necessary assumptions, however, are less demanding and more empirically plausible than they may initially appear.

2. *Inconsistency with insider accounts*

Judges and administrators do not explain the function and effect of hard look review in signaling terms. That is not to say there are no explicit judicial statements consistent with the theory's premises. The pages of the Federal Reporter are replete with candid recognitions of the asymmetric information problem.⁹⁰ Judges have also sometimes indicated, at least indirectly, that they recognize that the production of records and other forms of explanation taxes agency resources.⁹¹ And courts do occasionally make explicit

⁹⁰ See, e.g., *Sierra Club v. Costle*, 657 F.2d 298, 410 (D.C. Cir. 1981) ("We are not engineers, computer modelers, economists or statisticians, although many of the documents in this record require such expertise—and more."); *International Harvester Co. v. Ruckelshaus*, 478 F.2d 615, 650-51 (Bazelon, C.J., concurring in the result) ("Socrates said that wisdom is the recognition of how much one does not know. I may be wise if that is wisdom, because I recognize that I do not know enough ... to decide whether or not the government's approach ... was statistically valid").

⁹¹ For example, in *United States v. Ottati & Goss, Inc.*, 900 F.2d 429, 444-45 (1st Cir. 1990), then-Judge Breyer, in the process of chastising EPA's approach to a case involving a hazardous waste cleanup, asked, "[H]as the government taken account of the fact that preparing briefs and then asking an appeals court to work through such a [complex] maze [of record materials], in the face of a forty or fifty thousand page record, takes considerable time that its lawyers might devote to other cases ... and has it consciously decided that determination of this primarily site-, case-, and fact-specific appeal is significant to warrant such calls upon public resources?" Judge Breyer's opinion implies that the answer in that case was no; the court appears to believe the agency has acted irrationally. More generally, however, the language in *Ottati & Goss* is revealing insofar as it suggests that in other instances an agency's willingness to devote "considerable time" and "public resources" to a given controversial action may indeed indicate that the

reference to the size or detail of the agency's record in a way that suggests this may have influenced the court's views on whether the agency acted rationally. For example, in *Baltimore Gas & Electric Co. v. Natural Resources Defense Council*, the Supreme Court observed, in support of its decision upholding a Nuclear Regulator Commission rule related to the environmental impact of nuclear power, that the "sheer volume of proceedings before the Commission is impressive and that "the Commission's Statement of conclusions announcing the ... [challenged] rule shows that it has digested this mass of material...."⁹² Nonetheless, judicial opinions generally do not explain decisions in hard look cases in terms of the cost to the agency of preparing the record presented to the court for review. Agency officials, to the extent that they offer any explanation for the factors that influence preparation of a record, also do not generally characterize their actions in terms of impressing judges with how much the record cost to produce in order to signal how much the agency values the regulation.

While the costly signaling hypothesis would doubtless be stronger if it found support in the explanations and accounts given by judges and administrators, the fact that these

agency considers the action "significant enough." The latter type of reasoning would correspond closely to the costly signaling theory, even if the situation and reasoning in *Ottati & Goss* itself does not.

⁹² 462 U.S. 87, 98-99 & n.11. See also, e.g., *City of Shoreacres v. Waterworth*, 420 F.3d 440, 446 n.3 (5th Cir. 2005) (upholding decision by the Army Corps of Engineers that certain waters were not wetlands subject to Corps jurisdiction, emphasizing that the agency "developed an extensive administrative record in making its decision"); *Sierra Club v. Slater*, 120 F.3d 623, 633 (6th Cir. 1997) (concluding that the "plaintiffs have simply failed to present anything that would justify a conclusion by this court that the agency decision [not to prepare a supplemental environmental impact statement] was arbitrary and capricious" and supporting this conclusion by quoting the district court's statement that "[t]he record contains several hundred pages of government documents addressing specifically the question of whether a supplemental EIS is necessary.... For each of the plaintiff's claims, there are at least ten pages, and in most cases twenty to thirty pages, of detailed scientific study by neutral professionals and explanation of why Defendants made the substantive decisions they did"); *American Dental Ass'n v. Martin*, 984 F.2d 823, 824, (7th Cir. 1993) (observing at the outset that a workplace safety rule adopted by OSHA was "[p]romulgated after a protracted notice-and-comment rulemaking proceeding" and that "the rule and its supporting reasons occupy 178 densely packed pages in the *Federal Register*," and upholding the rule on the grounds that the reviewing court's duty "is merely to patrol the boundaries of reasonableness"); *Lepage v. Yeutter*, 917 F.2d 741, 745 (2d Cir. 1990) (holding that it was "entirely appropriate" for the Secretary of Agriculture to redefine a statutory term in the Food Stamp Act, and observing that the new "definition was based upon an extensive rulemaking record"); *Public Citizen Health Research Group v. Tyson*, 796 F.2d 1479, 1503 (D.C. Cir. 1986) (rejecting a challenge to an OSHA regulation and finding that the agency "surveyed all of [the] evidence exhaustively," had "considered the shortcomings of each submission and responded where possible," and in general had "completed the difficult task of regulating occupational exposure to carcinogens with a thorough and professional approach"); *Carsten v. Nuclear Regulatory Comm'n*, 742 F.2d 1546, 1551 (D.C. Cir. 1984) (concluding that the "voluminous record persuasively evidences the care with which the NRC discharged its statutory duties"); *Nat'l Soft Drink Ass'n v. Block*, 721 F.2d 1348, 1353-54 (D.C. Cir. 1983) (declaring that a "careful review of the voluminous record leaves us with the conclusion that the Secretary [of Agriculture] adequately considered the relevant information" and that the appellant "failed to demonstrate that the action of the Secretary ... was arbitrary, capricious, an abuse of discretion or otherwise contrary to law"); *Lead Industries Ass'n, Inc. v. EPA*, 647 F.2d 1130, 1184 (D.C. Cir. 1980) (stating that the "national ambient air quality standards for lead were the culmination of a process of rigorous scientific and public review"; that the EPA and participants in the rulemaking proceeding "deserve to be commended for the diligence with which they approached the task of coming to grips with these difficult issues"; and that the EPA's decisions are "adequately explained and amply supported by evidence in the record").

individuals do not describe hard look review as a signaling mechanism is not necessarily strong empirical evidence that the hypothesis is incorrect, for two reasons. First, even if judges and administrators understood their behavior in signaling terms, there would be powerful reasons to be less than candid about this. Judges are likely to prefer to portray their decisions as driven by considerations of judicial modesty or deference, or as based on a close analysis of agency reasoning. Administrators likewise have little incentive to describe the materials they submit to courts as expensive indications of commitment with little connection to the actual decision-making process, even if that were the main function of these materials. Second, and more importantly, it is not necessary that judges and administrators subjectively understand record production and hard look review in signaling terms. Just as an illiterate street vendor intuitively understands the concept of marginal cost, and the average used car buyer intuitively understands adverse selection, judges may have an intuitive sense that impressive looking records demonstrate serious commitment, and judges may also have a general, perhaps subconscious intuition that they ought to give more latitude to agencies that have demonstrated serious commitment than to those that have not. Meanwhile, agencies may have a general understanding that to get something by a skeptical reviewing court they have to do more to demonstrate serious commitment than they would if the court were more sympathetic to the type of regulation in question. The institution of hard look review was probably not designed to serve a costly signaling function, but if judges and administrators have the sort of intuitions just described, then hard look review may end up serving that function.

Ultimately, the question whether the costly signaling theory captures something important about the underlying causes of court or agency behavior ultimately turns on the theory's ability to provide a parsimonious account for a diverse set of empirical observations and to generate additional hypotheses that perform well in comparative empirical tests against rivals. This Article has suggested some ways in which the costly signaling theory of hard look review may account for aspects of the practice of hard look review that might otherwise appear anomalous or difficult to reconcile. The Article also suggests additional hypotheses that are in principle testable, though conducting such tests is beyond this Article's scope. These sorts of empirical tests will prove more important than the self-reporting of judges and administrators in establishing whether the costly signaling theory has any validity.

3. The unexplained choice of signaling mechanism

Another important objection to the idea that record quality functions as a costly signal is the failure of the argument to account for the agency's choice of signaling mechanism. If all that the agency is doing, when it compiles a high-quality record, is "burning money" in order to demonstrate the value it places on the proposed regulation, why does the agency signal through record quality rather than something else? The inability to account for the choice of signal mechanism is a limitation shared by many signaling

models.⁹³ Some scholars have advanced explanations as to why individuals or institutions would signal through particular types of behavior, even when more straightforward types of signals – including literal money burning – appear available.⁹⁴ These attempts, however, have not been entirely satisfactory. Although a full consideration of this issue is beyond the scope of this Article, there are several possible answers to this concern.

One possibility is that courts are better at assessing record quality and its associated costs than they are at assessing the costs associated with other possible signals.⁹⁵ Perhaps judges, due to their experience as lawyers and their regular evaluation of briefs, motions, and other written arguments, are fairly good at figuring out what it takes to produce a quality argument of this sort. If so, provision of a high-quality record may be a relatively efficient way for agencies to signal. One problem with this explanation is that courts must be able to figure out the subjective cost incurred by the agency whose decision is under review, and it is harder to tell a convincing story why courts would be particularly adept at making those sorts of judgments. Still, the question is not whether record quality is an ideal signal, but whether it is better than other available options, and it is at least conceivable that in some contexts record quality is one of the best available alternatives.

Another possibility is that even if other signaling mechanisms are possible and potentially more effective, judicial review of agency record quality was already built into, or at least compatible with, the system of judicial review of administrative action that had evolved over time under the APA. The legal and political actors who influenced the evolution of that system may never have consciously intended for the agency record quality to function as a costly signal, nor did they consider other mechanisms that might provide an equivalent or superior signaling function. Nonetheless, the system that emerged provides opportunities for agencies to signal to the court through record quality, even if no one consciously developed the system with that function in mind.⁹⁶ In that sense, the objection that judges and administrators do not consciously think about hard

⁹³ See Bernheim & Redding, *supra* note 2, at 464-65; Milgrom & Roberts, *supra* note 2, at 799-800; ERIC POSNER, LAW AND SOCIAL NORMS 155 (2000); Richard McAdams, *Signaling Discount Rates: Law, Norms, and Economic Methodology*, 110 YALE L.J. 625, 640 (2001).

⁹⁴ See, e.g., Bernheim & Redding, *supra* note 2, at 465-75; B. Douglas Bernheim, *Tax Policy and the Dividend Puzzle*, 22 RAND J. ECON. 455, 465-67 (1991); POSNER, *supra* note 93 at 155.

⁹⁵ This argument is analogous to the claim that the optimal type of “money burning” signal is one where the observer of the signal knows the true costs of the signal to the sender; a signal is less effective if it is more costly to some types of sender than to others, if the observer cannot tell the difference. See Bernheim & Redding, *supra* note 2, at 465-75; see also Bernheim, *supra* note 93, at 465-67. Similarly, Eric Posner suggests that the reason certain social behaviors are used as costly signals of individual discount rates, but other costly behaviors are not, is that people are better at assessing the costs associated with familiar actions and so are better at interpreting the signals that they send. POSNER, *supra* note 93, at 155. *But see* Kristin Madison, *Government, Signaling, and Social Norms*, 2001 U. ILL. L. REV. 867, 878 & n. 41 (pointing out that even unfamiliar actions, such as literally burning money, can have a more transparent cost structure than other more familiar behaviors).

⁹⁶ Cf. POSNER, *supra* note 93 at 155 (suggesting that signaling behaviors become entrenched if they have functioned effectively in the past, even if the signaling behavior is chosen arbitrarily as an initial matter).

look review in costly signaling terms may provide a partial answer to the objection that other more efficient signaling mechanisms might be available.

A related possibility is that agency records may perform both a signaling function and some other function. Most obviously, it may be the case that the agency record actually does provide the court with some useful substantive information, or at least has the potential to do so in some instances. Or, if we make the assumption, discussed below, that the quality of the record may also help the reviewing court to distinguish between expert agencies and ignorant agencies, then expert agencies would always prefer to signal using record quality, and ignorant agencies would mimic this behavior to avoid giving themselves away.⁹⁷

Finally, the fact that record quality may function as a signaling mechanism does not mean that agencies never use other mechanisms, either in addition to or instead of high-quality records. For example, an agency may signal the value it places on a particular regulation by investing a great deal of political capital in publicizing and promoting the regulation. If this or some other sort of agency behavior is both costly to the agency and observable by the reviewing court, then the agency might signal this way, instead of or in addition to signaling through record quality. A richer account of the relationship between regulating agencies and reviewing courts might incorporate, and explain the interactions and relative importance of, multiple signaling mechanisms.

II. EXTENSION: IMPERFECT AGENCY EXPERTISE

The preceding analysis assumed that the agency is always better-informed than the court about the true payoff of regulation. This assumption, though useful in demonstrating the basic intuition of the argument, is probably too strong. Here I consider one way in which this assumption might be relaxed: Instead of assuming that the agency always knows the true payoff before deciding whether to regulate, let us assume that there is some probability that the agency will become informed, but there is also some probability that it will learn nothing.⁹⁸ I will use the term *expertise* to refer to the probability that the agency is informed.⁹⁹

⁹⁷ See *infra* TAN 106-107.

⁹⁸ Another possible approach would allow the agency's information about the true payoff to vary continuously rather than dichotomously. One way to do this might be to suppose that the agency observes a noisy signal about the payoff, and the noise associated with this signal is inversely correlated with the agency's expertise. The dichotomous case is easier both analytically and expositionally, so I defer to future research an extension that allows an agency's information about the true payoff to vary on a continuum.

⁹⁹ In the formal model, the agency's *expertise* is the p parameter, which is the ex ante probability that $\theta=1$. It is important to emphasize the difference between the ex ante probability of becoming informed and the ex post fact of being informed. In ordinary conversation, the word "expert" is often used to describe either or both of these characteristics. For example, when we say an engineer is an expert on accident reconstruction, we mean that she is likely to be able to determine the causes of a particular accident, not that she necessarily will succeed in doing so. But when we say a scientist is an expert on Einstein's theory of relativity, we usually mean that she actually knows it, not that she's likely to know it. I am using "expertise" in the former sense. This reflects the fact that we say, for example, that OSHA has specialized

Incorporating the possibility that the agency may be uninformed introduces three features not present in the original analysis. First, the court will use the agency's decision to regulate and the quality of the record to draw inferences from about whether the agency is informed. This leads to hypotheses regarding how the behavior of the agency and court change as the agency's expertise changes. Second, it may be that uninformed agencies regulate less efficiently or effectively than informed agencies. Third, uninformed agencies may face higher marginal costs of producing high-quality records. Introducing this possibility is one way to capture the idea that courts have some ability to evaluate the substance of agency records while preserving the idea that sufficient effort by the agency can obscure analytical flaws.

A. *Optimal Record Quality With Imperfect Agency Expertise*

1. *Court inferences about agency information*

If an agency learns the true payoff sometimes but not always, then the agency's decision to regulate and its spending on record quality will provide the court with additional information about whether the agency is informed, as well as information about what the agency learned if it was informed. In some cases, the simple fact that the agency regulated signals that the agency is informed. This is easiest to see in an extreme case. Return to the OSHA example. Assume that the expected payoff is 10 and that OSHA's rationality threshold is 12. Assume further that OSHA's expertise is minimal but not nonexistent: the probability that OSHA learns the payoff before deciding whether to regulate is 5%. In the 95% of cases where OSHA remains uninformed, it would not regulate because the expected payoff is below OSHA's rationality threshold. The only circumstances in which OSHA would regulate is when OSHA both becomes informed and learns that the true payoff is 12 or more. The court can therefore infer from the fact that OSHA regulated that both of these circumstances existed, no matter how unlikely this was *ex ante*.

In other cases, the fact that the agency regulated may reduce the court's estimate of the probability that the agency is informed. Consider a version of the OSHA hypothetical in which the expected payoff is 10, OSHA's rationality threshold is eight, and its probability of learning the true payoff is 50%. If OSHA remains uninformed, it would nonetheless prefer to regulate because the expected payoff is above OSHA's rationality threshold. If OSHA becomes informed, it prefers to regulate if but only if the payoff is eight or more. Therefore, if OSHA regulates, the court cannot rule out the possibility that OSHA was uninformed (a 50% probability *ex ante*), nor can the court rule out the possibility that OSHA was informed and observed a payoff of eight or more (a 30% probability *ex ante*). The court can, however, rule out the possibility that OSHA was informed and observed a payoff below eight (a 20% probability *ex ante*). From this, the court can adjust its estimate of the probability that OSHA was informed from 50% to 37.5%.¹⁰⁰

expertise in workplace safety, we usually mean that OSHA is more likely than other decision-makers to analyze a workplace safety issue correctly, not that it knows the answers to all questions on this topic.

The agency can also use spending on record quality to signal to the court that it is informed. Suppose in the OSHA example that the expected payoff is 10, OSHA's rationality threshold is eight, and OSHA's ex ante probability of becoming informed is 50%. If OSHA regulates and spends nothing on record quality, the court's ex post estimate of the probability that the agency is informed is 37.5%. But suppose OSHA regulates and spends an amount on record quality that is just greater, in utility terms, than the benefit to OSHA of saving two additional lives. The court can now infer that OSHA was definitely informed, because otherwise OSHA's decision to regulate and produce a record of such quality would be irrational.

2. *The impact of expertise on record quality*

How does an agency's expertise—again, defined as the ex ante probability of becoming informed—affect the record quality demanded by courts and supplied by agencies? As before, the agency that chooses to regulate will spend the minimum amount necessary to protect its regulation from judicial reversal. If that amount is sufficiently high that an uninformed agency would never regulate, then variation in agency expertise has no effect on the quality of the records that regulating agencies produce. The reason is that if the court knows that only informed agencies will regulate, then the court's demand for record quality is unaffected by the ex ante probability that the agency would become informed. The frequency of regulation, however, would be affected by agency expertise, because uninformed agencies will pass on opportunities to enact regulation that an informed agency would recognize are worth the costs associated with the likelihood of spending on record quality necessary to survive judicial review is not enough to guarantee that only informed agencies regulate, then expertise does affect record quality. To see this, return to the OSHA hypothetical and imagine that the regulation is equally likely ex ante to save any number of lives between zero and 20 (which means the expected payoff is 10), OSHA has a 50% chance of becoming informed, OSHA's rationality threshold is six, and the court's rationality threshold is 11.5. If OSHA regulates and spends the utility equivalent of four lives on record quality, the court can infer with certainty that OSHA is informed, and the court's updated estimate of the expected payoff (15) is more than sufficient for the court to uphold the regulation. But OSHA does not need to spend so much. Suppose OSHA only spends the utility equivalent of two lives on record quality. This is not enough to guarantee that OSHA is informed; the ex post probability that it is informed in this example is 37.5%.¹⁰¹ The court calculates its updated expected payoff by multiplying the probability that OSHA was uninformed when it regulated (62.5%) by the expected payoff from

¹⁰⁰ By Bayes' Rule, the probability that OSHA is informed given that it regulated is equal to the probability that the agency would regulate if it is informed (60%), times the probability that it is informed (50%), divided by the sum of (1) the probability that the agency would regulate if it is informed (60%) times the probability it is informed (50%), and (2) the probability that the agency would regulate if it is uninformed (100%) times the probability it is uninformed (50%). $\frac{(0.6)(0.5)}{(0.6)(0.5)+1(0.5)} = \frac{0.6}{1.6} = 0.375$.

¹⁰¹ See *supra* note 100.

regulation by an uninformed agency (10), and adding this to the product of the probability that OSHA was informed when it regulated (37.5%) and the expected payoff of regulation if OSHA was informed (14).¹⁰² The court can therefore infer an expected payoff of $(0.375 \times 14) + (0.625 \times 10) = 11.5$. This is high enough for the court to uphold the regulation, even though the court cannot rule out the possibility that the agency was uninformed when it regulated. There is therefore no reason for the agency to spend more on record quality.

In this type of case, increasing agency expertise lowers the quality of the records that regulating agencies produce. The reason is that the higher the *ex ante* probability the agency is informed, the higher the court's *ex post* estimate of the probability that the agency actually was informed when it regulated. There is therefore less need for the agency to signal that, if it was informed, it must have observed a very high payoff. In other words, expert agencies do not need to do as much, in terms of elaborate and expensive justification, in order to get their regulations upheld by the courts, and for this reason more expert agencies can get away with providing lower-quality records.¹⁰³ This result is somewhat counterintuitive. One might have expected that, on average, more expert agencies would produce higher-quality records. This would indeed be the case if the quality of the record was a true reflection of the agency's understanding and analysis of the substantive issue. But if record quality is primarily a signal of intensity of preference, then it may be uncorrelated or negatively correlated with the agency's expertise. If uninformed agencies would not regulate, then expertise will be uncorrelated with record quality; if uninformed agencies would regulate, then greater agency expertise will translate into lower-quality records, all else equal. Operationalizing these prediction will likely prove challenging, but it is in principle the predictions are testable.

B. Information and Regulatory Efficiency

Sometimes the information an agency acquires in the course of its research not only helps it estimate the payoff more accurately, it also allows the agency to regulate more efficiently. For example, OSHA's research into the chemical properties of a potentially hazardous substance may lead the agency to tailor its regulations in a more appropriate way or to use more accurate methods for measuring compliance, with the end result that the regulation saves more lives at lower cost. This effect may be independent of the purely informational benefit OSHA obtains by acquiring more accurate information about a regulation's impact. To put the point another way, successful research may not only help the agency learn the payoff, it may also increase the payoff. One way to conceptualize this phenomenon and integrate it into the earlier analysis is to characterize the difference in the quality of regulation by an informed agency and regulation by an

¹⁰² Because OSHA's rationality threshold is six and the record quality entails a utility cost of two, the fact that OSHA regulated means that, if OSHA were informed, the true payoff that OSHA observed must have been between eight and 20. Because of the assumption that any payoff in this range is equally likely, the expected payoff of regulation conditional on OSHA being informed is 14.

¹⁰³ The formal version of this result is given in Remark 2. See Appendix, *infra*.

uninformed agency as an *ignorance penalty* associated with uninformed regulation.¹⁰⁴ Because the ignorance penalty lowers the expected payoff of uninformed regulation, its impact on record quality can be analyzed by considering how record quality would change as the expected payoff of uninformed regulation decreases.¹⁰⁵

First, lowering the expected payoff of uninformed regulation makes it less likely that the agency can get away with regulating when the court is unsure whether the agency is informed. The reason is that a lower expected payoff means the cost to the court of uninformed regulation is higher. If, despite this cost, the court would uphold regulation even when record quality is not high enough to ensure that the regulating agency is informed, then decreasing the expected payoff of uninformed regulation (i.e., increasing the ignorance penalty) will increase record quality: As the costs associated with uninformed regulation go up, the agency must compensate by signaling that the benefits associated with informed regulation have also gone up.

Next, consider the effect of the ignorance penalty on record quality in cases where only an informed agency would regulate. If the minimum amount the agency must spend on record quality is more than enough to signal that the agency is informed, changes in the ignorance penalty have no effect on record quality. This is because, if only informed agencies regulate, then the expected payoff of uninformed regulation does not affect the court's expected benefit from upholding regulation. But, if the minimum record quality necessary to survive judicial review is just enough to signal that the agency is informed, then increases in the ignorance penalty decrease record quality: If record quality must be just high enough that the uninformed agency would not regulate, any decrease in the benefit of uninformed regulation to the agency decreases the amount the agency needs to spend to signal that it is informed.

These observations imply no straightforward relationship between the ignorance penalty and the quality of the records that agencies produce. To predict the ignorance penalty's effect on record quality, one must know more about what exactly the agency must signal to satisfy the court. If the agency does not need to prove it is informed, increasing the ignorance penalty increases record quality. If the regulating agency needs to send a signal just strong enough to convince the court that it is informed, increasing the ignorance penalty decreases record quality. If the agency must provide the court with a record that goes beyond the minimum necessary to show that the agency is informed, changing the size of the ignorance penalty has no direct effect on record quality.

C. Information and Record Quality Costs

The assumption that agency staff can produce equally impressive-looking records regardless of whether the agency actually succeeded in acquiring valuable information may be plausible in some circumstances, but it is also possible that informed agencies have an easier time producing impressive records than uninformed agencies do. This

¹⁰⁴ In the formal model, the ignorance penalty is parameter $k(b)$. The μ parameter incorporates k directly because μ is defined as $E(b-k(b))$. See Appendix, *infra*.

¹⁰⁵ The formal versions of these results are given in Remark 4. See Appendix, *infra*.

possibility provides one way to relax the assumptions, made in the preliminary analysis, that courts are entirely incapable of assessing the content of an agency record on the merits.¹⁰⁶ We might suppose that courts, though unable to verify whether an agency's ultimate conclusions are true or not, have some limited ability to tell whether a record was produced by a truly expert agency or not. Uninformed agencies, however, might still be able to "fake it" – providing a record that looks good enough that the reviewing court is unable to spot the flaws – but doing so takes more time and effort than would be required if the agency were truly expert and could provide a more "honest" record. It may also be that at least some policy-relevant factual information, if discovered by the agency, could be included in the administrative record, even if the court is not able to understand the substance of the explanation. Thus, while both informed agencies and uninformed agencies may be able to produce records of similar quality, uninformed agencies may face higher marginal costs of record quality production. Call the difference between the marginal record quality costs for uninformed agencies and informed agencies the *ignorance tax*.¹⁰⁷

What effect does the ignorance tax have on record quality? As with the ignorance penalty, the answer is not straightforward. In cases where uninformed agencies would still regulate, increases in the ignorance tax have no direct effect on record quality. Such increases do, however, make it less likely that courts will be unsure whether a regulating agency is informed, because if the ignorance tax is high enough, it is no longer worth it to the uninformed agency to "fake it." In cases where the court demands and receives record quality beyond the minimum required to demonstrate that the agency is informed, then the ignorance tax again has no direct effect on record quality because in these cases only informed agencies regulate. The ignorance tax does, however, have a direct effect in cases where the record quality sufficient to satisfy the court is just high enough to signal that the agency is informed. In such cases, increasing the ignorance tax decreases record quality, because it takes less record quality for informed agencies to differentiate themselves from uninformed agencies.¹⁰⁸

Speaking more generally, when the relative cost to an uninformed agency of providing a high-quality record goes up, record quality may decline, because it takes less record quality to signal to the court that the agency is informed. This effect only occurs, however, when the need to signal that the agency is informed is the factor that determines

¹⁰⁶ See *supra* TAN 70.

¹⁰⁷ In the formal model, the *ignorance tax* is parameter t . See Appendix, *infra*. Note that if the ignorance tax is infinite, then only an informed agency can produce a quality record. This special case corresponds to a situation in which it is impossible for an uninformed agency to pass itself off as informed. One important limitation of the analysis here is that although the ignorance tax allows for the possibility that informed and uninformed agencies face different marginal record quality costs, all informed agencies continue to have the same record quality costs regardless of what they learn about the true value of the payoff. A possible extension of the model might allow quality costs to vary depending on the specific content of the signal sent by the agency to the court. One possibility would be a model in which the agency announces a specific observed value of the true payoff, and its record quality costs are a function of the difference between the true observed payoff and the announced observed payoff. This sort of set-up starts to approximate the situation in which the court can assess the content of an agency record on the merits.

¹⁰⁸ The formal versions of these results are given in Remark 3. See Appendix, *infra*.

record quality. When signaling to the court that the agency is informed is either unnecessary or insufficient for the court to uphold regulation, the fact that it is more costly for uninformed agencies to produce record quality does not have any direct effect on record quality. Therefore, while the ignorance tax is negatively correlated with equilibrium record quality in some circumstances, the scope and magnitude of this effect is bounded, and in many cases changes in the magnitude of the ignorance tax will have no observable effect on record quality or on agency or court behavior.

III. OTHER APPLICATIONS

The costly signaling perspective is particularly well-suited to hard look judicial review of agency regulations, but this dynamic may be at work in a variety of other public law contexts in which the primary government decision-maker is, or may be, better informed than the court about relevant aspects of the policy issue; the preferences of the court and the government are divergent but correlated; and the government actor that decides to implement a new policy can take some costly action that the court can observe. Consider two other possible applications, at opposite ends of the public law hierarchy: the Supreme Court's review of congressional findings in constitutional litigation, and a magistrate's review of a police officer's application for a search warrant.

A. *Constitutional Law: State Interest and Congressional Jurisdiction*

In certain areas of constitutional law, the Supreme Court has suggested that the constitutionality of legislative action may depend in part on the quality of the legislative record. Though these cases are still more the exception than the rule, and the Court denies that anything like administrative law style hard look review is appropriate in constitutional review of legislation, there are at least two contexts where the Supreme Court appears to have hinted at this approach. First, there are a handful of opinions, particularly in First Amendment cases, in which the Court has looked to the legislative record in order to determine whether the government had demonstrated a sufficiently strong state interest in enacting the challenged legislation. Second, the Court has evaluated the quality of the legislative record in several cases raising the question whether congressional legislation is authorized by Section Five of the Fourteenth Amendment. In both these contexts, the Court's inquiry into the quality of the legislative record has been seen either as an illegitimate excuse for outcome-oriented decision-making or as a means by which the Court might acquire additional substantive information to inform the Court's independent judgment. The costly signaling theory provides an alternative or supplementary perspective on these cases.

Suppose that Congress¹⁰⁹ is (or may be) relatively better-informed about factual questions that it deems relevant to the desirability of the legislation in question and that the Court considers relevant to the legislation's constitutionality. Congress, however, cannot communicate this information verifiably to the Court. Suppose further that the

¹⁰⁹ Though the text refers to Congress, the analysis would be the same for a state or local government.

preferences of the Court and Congress are positively correlated in expectation – legislation that Congress prefers more strongly is, on average, more likely to be deemed constitutional by the Court – but their preferences diverge: In some circumstances Congress would like to pass legislation that the Court, if fully informed, would find unconstitutional. Finally, suppose that the generation of a high quality legislative record is costly to Congress and that the Court knows this. If these conditions hold, then the quality of the legislative record may perform a signaling function in the constitutional law context similar to the signaling function of the administrative record in the APA context.

1. *Strength of the state interest*

In many cases, for example in much First Amendment litigation, the strength of the government interest in challenged legislation is a constitutionally relevant issue, and evaluating this interest entails a factual determination about the legislation’s likely impact. Consider, for example, the Supreme Court’s successive decisions in litigation over the “must carry” provisions of the 1992 Cable Television Consumer Protection and Competition Act, which required cable television providers to devote a certain number of their channels to local broadcast stations. In *Turner Broadcasting System, Inc. v. FCC (Turner I)*,¹¹⁰ the Court, applying an intermediate level of First Amendment scrutiny, asked whether the must-carry provisions were narrowly tailored to further a substantial governmental interest.¹¹¹ Although a majority of the Court accepted the legitimacy of at least some of the government’s proffered interests, which included preservation of broadcast diversity and fair competition, the Court was more skeptical about the claimed connection between the must-carry requirements and the achievement of these ends. Justice Kennedy’s plurality opinion noted that Congress as an institution “is far better equipped than the judiciary to ‘amass and evaluate the vast amounts of data’ bearing upon an issue as complex and dynamic” as this.¹¹² But, although the plurality insisted that “Congress is not obligated, when enacting its statutes, to make a record of the type that an administrative agency or court does to accommodate judicial review,”¹¹³ the Court reversed the district court’s grant of summary judgment in the government’s favor on the grounds that the record before the Court (which did not include the full legislative record) failed to establish that Congress could reasonably infer that the must-carry provisions were narrowly tailored to advance legitimate government interests.¹¹⁴ When the issue

¹¹⁰ 512 U.S. 622 (1994).

¹¹¹ *Id.* at 661-62.

¹¹² *Id.* at 665-66 (quoting *Walters v. National Assn. of Radiation Survivors*, 473 U.S. 305, 331 n.12 (1985)).

¹¹³ *Turner I*, 512 U.S., at 666.

¹¹⁴ *Id.* at 664-68. Justice Blackmun concurred, but emphasized that deference is ordinarily due to Congress’s predictive judgments, “particularly where ... that legislative body has compiled an extensive record in the course of reaching its judgment.” *Id.* at 669 (Blackmun, J., concurring). Justice Blackmun also observed that the record before the district court did not include the entire legislative record. *Id.* Justice Stevens concurred in part and concurred in the judgment, but thought that in light of the deference due Congress’s predictive judgments, the Court should have affirmed. *Id.* at 669, 671-74 (Stevens, J.,

reached the Court again in *Turner Broadcasting System, Inc. v. FCC (Turner II)*,¹¹⁵ however, the Court upheld the Act. This time, the Court had before it the full legislative record, including hearing testimony and statements by Senators and representatives. This record enabled the Court to conclude that there was indeed substantial evidence to support Congress's judgment that the must-carry provisions were related to an important government interest.¹¹⁶ Though the dissent argued that the legislative record did not in fact suffice to demonstrate the reasonability of Congress's judgment,¹¹⁷ the majority replied that the amount of detail demanded by the dissent was unwarranted.¹¹⁸

The Court's emphasis on the adequacy of the legislative record in *Turner I* and *Turner II* attracted scholarly attention.¹¹⁹ Despite the Court's protestations to the contrary, some suggested that the Court was treating Congress like an administrative agency, applying a kind of hard look review to the legislative record.¹²⁰ Furthermore, the Court appeared to use something like this approach in other First Amendment cases,¹²¹ and there have been hints of something similar in other constitutional contexts where the strength or legitimacy of the government's interest is at issue.¹²² The conventional

concurring in part and concurring in the judgment). Justices O'Connor, Scalia, Ginsburg, and Thomas would have reversed on the grounds that the must-carry provisions were content-based. *Id.*, at 674 (O'Connor, J., concurring in part and dissenting in part); 512 U.S. at 685 (Ginsburg, J., concurring in part and dissenting in part).

¹¹⁵ 520 U.S. 180 (1997).

¹¹⁶ *Id.* at 196-213. Justice Kennedy's opinion for the Court was joined in full by Chief Justice Rehnquist and Justices Stevens and Souter. Justice Breyer concurred in part, but he did not accept promotion of "fair competition" as a constitutionally legitimate legislative objective. *Id.* at 226-27 (Breyer, J., concurring in part).

¹¹⁷ *Turner II*, 520 U.S., at 237-49 (O'Connor, J., dissenting). Justices Scalia, Thomas, and Ginsburg joined Justice O'Connor's dissent.

¹¹⁸ *Turner II*, 520 U.S., at 213.

¹¹⁹ See A. Christopher Bryant & Timothy J. Simeone, *Remanding to Congress: The Supreme Court's New "On the Record" Constitutional Review of Federal Statutes*, 86 CORNELL L. REV. 328, 332-38 (2001).

¹²⁰ See *id.* at 338-39.

¹²¹ See *United States v. Playboy Entertainment Group, Inc.*, 529 U.S. 803, 822 (2000) (holding that the government failed to meet its burden of demonstrating a sufficiently weighty justification for the content-based "signal bleed" provision in the Telecommunications Act, observing that "[n]o support for the restriction can be found in the barren legislative record This is not to suggest that a 10,000-page record must be compiled in every case ... but the Government must present more than anecdote and supposition"); *Nixon v. Shrink Missouri Government PAC*, 528 U.S. 377, 391-92 (2000) (noting that although the Court has "never accepted mere conjecture as adequate to carry a First Amendment burden," the "quantum of empirical evidence needed to satisfy heightened judicial scrutiny of legislative judgments will vary up or down with the novelty and plausibility of the justification raised," and that the justification for the state campaign finance restriction at issue was adequately justified by the record); *Bartnicki v. Vopper*, 532 U.S. 514, 530-31 & n.17 (rejecting one of the Government's proffered justifications for a statutory prohibition on disclosing information obtained through an illegal wiretap, given that "there is no empirical evidence to support the assumption that the prohibition against disclosures reduces the number of illegal interceptions" and the "dearth of evidence in the legislative record to support [this] dry-up the-market theory").

¹²² For example, in the controversial Takings Clause decision in *Kelo v. City of New London*, ___ U.S. ___ (2005), Justice Stevens' majority opinion emphasized the extensive record evidence supporting the City of New London's assertion that the taking at issue in that case would serve a public purpose, ___ U.S., at ___, and Justice Kennedy's concurrence stressed this point as well, ___ U.S., at ___ (Kennedy, J., concurring).

understanding of the Court's focus on the legislative record in these cases is that the Court needs the legislature to provide enough information for the Court to evaluate the merit, or at least the plausibility, of the government's proffered justification.¹²³ Another more cynical view is that the Court uses the adequacy or inadequacy of the record as an excuse to reach the result that the Court prefers on substantive grounds.¹²⁴

The costly signaling theory provides another perspective on what the Court might accomplish by adopting a highly deferential posture toward legislative predictions or factual determinations only if they are supported by a sufficiently compelling legislative record. To illustrate using the issue presented in the *Turner* cases, suppose that the Court and Congress both dislike restrictions on speech (though perhaps for different reasons) but believe that broadcast diversity is an important and legitimate government interest. Suppose further, however, that the Court is relatively more concerned about speech and less concerned about broadcast diversity. There is factual uncertainty about the impact of the must-carry provisions on broadcast diversity, and Congress has better information about this than the Court. Because it is costly for legislators to produce a record to support the must-carry provisions – hearings, after all, take time that could be devoted to constituency service, campaigning, or other legislative activity¹²⁵ – the length and detail of the legislative record may indicate to the Court something about how much Congress cares about the must-carry provisions. This in turn conveys information to the Court regarding the likely impact of the regulation on broadcast diversity. The Court might therefore be willing to uphold a given statute only if it is accompanied by a sufficiently impressive legislative record, even if the Court does not actually learn anything from the record's substantive content.

2. *Legitimacy of prophylactic legislation*

The Court has sometimes looked to the quantity and quality of congressional findings in order to assess whether a statute falls within the scope of Congress's enumerated powers, particularly in cases addressing Congress's power under Section Five of the Fourteenth Amendment. As in the First Amendment cases, the Court generally denies that the quality of the legislative record plays an important role in decisions regarding the scope of Section Five.¹²⁶ In *City of Boerne v. Flores*,¹²⁷ which struck down the Religious

(observing that “[t]he city complied with elaborate procedural requirements that facilitate review of the record and inquiry into the city’s purposes”).

¹²³ Philip P. Frickey & Steven S. Smith, *Judicial Review, the Congressional Process, and the Federalism Cases: An Interdisciplinary Critique*, 111 YALE L.J. 1707, 1740 (2002); Harold J. Krent, *Turning Congress into an Agency: The Propriety of Requiring Legislative Findings*, 46 CASE W. RES. L. REV. 731, 736 (1996).

¹²⁴ See Frickey & Smith, *supra* note 123, at 1736-37.

¹²⁵ See Bryant & Simeone, *supra* note 119, at 384; Ruth Colker & James J. Brudney, *Dissing Congress*, 100 MICH. L. REV. 80, 120-21 (2001); Krent, *supra* note 123, at 736.

¹²⁶ For discussions of the Court's use of legislative record review in Section Five cases, see Bryant & Simeone, *supra* note 119, at 345-53; William W. Buzbee & Robert A. Schapiro, *Legislative Record Review*, 54 STAN. L. REV. 87, 111-18 (2001); Frickey & Smith, *supra* note 123, at 1722-24.

¹²⁷ 521 U.S. 507 (1997).

Freedom Restoration Act, the Court observed that the legislative record did not support the government's claim that the Act was necessary to prevent instances of constitutionally prohibited government burdens on religion¹²⁸ but insisted that the "lack of support in the legislative record" was not dispositive and that judicial deference to Congress is generally not "based on the state of the legislative record Congress compiles...."¹²⁹ In subsequent Section Five cases, however, the Court appeared to attach substantial importance to the quality of the legislative record. In several cases involving congressional attempts to invoke Section Five to abrogate state sovereign immunity, for example, the Court has invalidated statutory provisions on the grounds that the legislative record provided insufficient support for the claim that the challenged provision was appropriately tailored to remedying or preventing constitutional violations.¹³⁰ The Court has also relied heavily on the quality of the legislative record in post-*Boerne* decisions upholding congressional statutes abrogating state sovereign immunity pursuant to Section Five.¹³¹

¹²⁸ *Id.* at 530.

¹²⁹ *Id.* at 531.

¹³⁰ For example, in *Florida Prepaid Postsecondary Expense Board v. College Savings Bank*, 527 U.S. 627 (1999), the Court held that the Patent Remedy Act's abrogation of state sovereign immunity from infringement suits was not valid under Section Five, and much of the Court's reasoning focused on the inadequacy of the legislative record. Though the Court insisted that "lack of support in the legislative record is not determinative," *id.* at 646, it emphasized that "identifying the targeted constitutional wrong or evil is still a critical part of [the] §5 calculus," *id.*, and observed that in this case "the record offers at best scant support for Congress' conclusion that States were depriving patent owners of property without due process of law by pleading sovereign immunity in federal-court patent actions," *id.* In particular, the Court observed that "Congress came up with little evidence of infringing conduct on the part of the States," *id.* at 640, and that "Congress ... said nothing about the existence or adequacy of state remedies in the statute or in the Senate Report, and made only a few fleeting references to State remedies in the House Report," *id.* at 644. Another example is *Kimel v. Florida Board of Regents*, 528 U.S. 62 (2000), in which the Court had to decide whether the Age Discrimination in Employment Act was valid prophylactic legislation or an illegitimate attempt to redefine the scope of the constitutional prohibition on age discrimination. The Court declared that "[o]ne means by which we have made such a determination in the past is by examining the legislative record," *id.* at 88, and that in this case this legislative record "consists almost entirely of isolated sentences clipped from floor debates and legislative reports," *id.* at 89. The Court did, however, note that lack of support in the legislative record "is not determinative," *id.* at 91. A third Section Five/sovereign immunity case in which the Court focused on alleged deficiencies in the legislative record is *Board of Trustees of the University of Alabama v. Garrett*, 531 U.S. 356 (2001), a case involving the Americans with Disabilities Act (ADA). The Court held that the ADA's provision abrogating state sovereign immunity was invalid because the "legislative record of the ADA ... simply fails to show that Congress did in fact identify a pattern of irrational state discrimination in employment against the disabled." *Id.* at 368. Though Congress had made extensive findings with respect to employment discrimination against the disabled, the Court found these findings too "general" to conclude that there was a pattern of discrimination by states, *id.* at 369, and the Court also emphasized that, if Congress had understood the available evidence as establishing a pattern of state employment discrimination against the disabled, "one would expect some mention of that conclusion in the Act's legislative findings. There is none." *Id.* at 371.

¹³¹ For example, *Nevada Department of Human Resources v. Hibbs*, 538 U.S. 721 (2003), upheld a provision of the Family and Medical Leave Act (FMLA) that abrogated state sovereign immunity as a valid exercise of Congress's power under Section Five to enforce the constitutional prohibition on gender discrimination. The Court stressed that, "[a]ccording to evidence that was before Congress when it enacted the FMLA, States continue to rely on invalid gender stereotypes in the employment context, specifically in

Again, it is possible to explain the Court's emphasis on the legislative record in terms of the Court's acquisition of information from Congress about constitutionally relevant issues. This appears to be what the *Boerne* Court meant to suggest when it disclaimed any notion that its decision was based on inadequacies in the legislative record. This view was articulated even more clearly in the Commerce Clause cases *United States v. Lopez*¹³² and *United States v. Morrison*,¹³³ which emphasized that, "while Congress normally is not required to make formal findings as to the substantial burdens that an activity has on interstate commerce, the existence of such findings may enable [a court] to evaluate the legislative judgment that an activity ... substantially affects interstate commerce, even though no such substantial effect is visible to the naked eye."¹³⁴ It is also possible, here as elsewhere, that the Court's discussions of the legislative record are merely a way for the Court to justify reaching a preferred outcome. While I do not dispute the plausibility of either of these hypotheses, the costly signaling hypothesis suggests another possibility. It may be that both the Court and Congress think that prophylactic legislation pursuant to Section Five can be a good thing, but only if constitutional violations absent the legislation would be sufficiently widespread. Congress may have better information on this factual question than the Court, but the Court might have a higher standard than Congress for how prevalent constitutional violations must be in order for prophylactic legislation to be justifiable. If these conditions hold, and if legislative record quality is costly to legislators, then the Court's evaluation of the legislative record may be explicable, at least in part, in terms of the information it conveys about how serious Congress perceives the issue to be.¹³⁵

B. Criminal Procedure: The Warrant Requirement

the administration of leave benefits," *id.* at 730. The Court observed that the FMLA's legislative record included statistical evidence, testimony, and historical evidence of state practice, all of which supported the claim that the FMLA was valid prophylactic legislation. *Id.*, at 730-32. The Court similarly emphasized the quality of the legislative record in *Tennessee v. Lane*, 541 U.S. 509 (2004), which held that Title II of the ADA validly abrogated state sovereign immunity in cases implicating the fundamental right of access to the courts. The Court observed that the "sheer volume of evidence demonstrating the nature and extent of unconstitutional discrimination against persons with disabilities in the provision of public services" demonstrated the sufficiency of the record to support an exercise of Congress's prophylactic Section Five powers, *id.* at 528, and the Court noted further that "the record of constitutional violations in this case ... far exceeds the record in *Hibbs*," *id.* at 529.

¹³² 514 U.S. 549 (1995).

¹³³ 529 U.S. 598 (2000).

¹³⁴ *Morrison*, 529 U.S. at 612 (quoting *Lopez*, 514 U.S. at 562-63) (internal citations and quotation marks omitted). In the Fifth Circuit's opinion in *Lopez*, 2 F.3d 1342 (5th Cir. 1993), the court appeared to believe that the validity of a congressional exercise of the Commerce Clause power would turn, at least as a practical matter, on the existence of legislative findings that the activity regulated has a substantial effect on interstate commerce. *Id.*, at 1363-66. The Supreme Court's decisions in both *Lopez* and *Morrison* both appear to reject that notion, however.

¹³⁵ Harold Krent has made the similar argument that legislative record review may "represent[] a second-best solution to the problem of unconstrained legislative power" because the imposition of "additional transaction costs may force Congress to be more cautious and deliberate in fashioning legislation at the margins" of its constitutional authority. Krent, *supra* note 123, at 744.

Though the costly signaling dynamic finds few obvious applications in criminal law, there is at least one point in the criminal process where it may come into play: review by magistrate judges of police applications for search warrants. Criminal law scholars have noted that police applications for warrants are almost always approved,¹³⁶ and that searches pursuant to warrants have a very high success rate.¹³⁷ One explanation for this high success rate is that obtaining a warrant is costly to the police, and this cost acts as a screening device that makes police unlikely to apply for warrants unless they anticipate that the search is very likely to turn up valuable evidence. This may explain why warranted searches are usually successful despite the fact that the magistrate review of warrant applications so often appears cursory and deferential.¹³⁸ Furthermore, the high approval rate for warrant applications may also be explained, at least in part, by the cost to police of seeking a warrant. The reviewing magistrate is generally less well-informed, relative to the applicant police officer, as to whether the information proffered in the warrant application is sufficient for the magistrate to consider a search justified. It may also be the case that the preferences of the officer and the magistrate are positively correlated – both want to catch criminals and avoid harassment of the innocent – but the magistrate attaches greater relative weight to the latter goal than the officer does. If applying for a warrant is costly to the police, and the magistrate knows this, then the fact that the applicant officer went to the trouble of seeking the warrant enables the magistrate to update her assessment of the probability that the search is justified from the magistrate’s perspective, even if the magistrate learns nothing substantive from the information in the warrant application.

One comparative prediction that arises from this conjecture is that if the cost to the police of obtaining a warrant goes down – say, if the jurisdiction allows police to apply for warrants over the telephone¹³⁹ – then, all else equal, a magistrate’s propensity to grant a police officer’s warrant application will go down. This implies that some warrant applications that otherwise would have been granted will not be, though this will not necessarily result in a lower application approval rate if the police anticipate the change

¹³⁶ William J. Stuntz, *Local Policing After the Terror*, 111 YALE L.J. 2137, 2183 & n. 142 (2002); Silas J. Wasserstrom & Louis Michael Seidman, *The Fourth Amendment as Constitutional Theory*, 77 GEO. L.J. 19, 34 & n. 63 (1988).

¹³⁷ Donald Dripps, *Living with Leon*, 95 YALE L.J. 906, 925 (1986).

¹³⁸ *Id.* at 908 & n.119. Other scholars have discussed this argument, with varying degrees of sympathy. See, e.g., William J. Stuntz, *Warrants and Fourth Amendment Remedies*, 77 VA. L. REV. 881, 891-92 (1991) (noting the argument that the cost of warrants performs a screening function but also observing that this screening function could be more efficiently performed in other ways); David A. Sklansky, *Quasi-Affirmative Rights in Constitutional Procedure*, 88 VA. L. REV. 1229, 1246-47 n.50 (observing that the true value of warrants may lie in the fact that they impose costs on police applicants, but questioning whether the current system imposes the “optimum level of hassle”). Both Stuntz and Sklansky seem to accept Dripps’ positive claim that the high success rates of warranted searches may be explained by the fact that the cost of warrants screens out searches with low expected value. Their objections concern whether this screening could be achieved in some other, more socially desirable way (Stuntz’s objection), *cf. supra*. Part I.D.3, and whether the cost of obtaining a warrant has been set at a socially optimal level (Sklansky’s objections).

¹³⁹ Telephonic warrants are constitutionally permissible. Though some jurisdictions have introduced them, most have not. See Stuntz, *supra* note 138, at 892.

in standards and do not apply in the marginal cases. Alternatively, magistrates may respond by finding other ways to raise the costs of warrant applications, perhaps by introducing more serious questioning of police and requiring more explanation of the evidence supporting the application. If the latter approach is possible, it may end up being more efficient, insofar as it is easier for police and reviewing magistrates to calibrate the size of the signaling cost. The costly signaling perspective may therefore supplement existing functional explanations of the warrant requirement and provide a testable comparative hypothesis regarding the impact of lowering warrant application costs via the introduction of telephonic warrants.¹⁴⁰

CONCLUSION

Generalist judges with the responsibility to review decisions by other government actors are handicapped by the fact that these other actors – be they agencies, legislatures, or police officers – often have better access to decision-relevant information. The judiciary’s institutional limitations make this asymmetric information problem difficult to overcome. Even if judges demand and receive an explanation from the government agent whose decision is under review, judges may be limited in their ability to interpret or evaluate the information contained in such an explanation. But there may be other more subtle and indirect ways for courts to mitigate this asymmetric information problem. The fact that the government has chosen to act may itself be informative as to the government’s information about the likely impact of its action. Reviewing courts can also learn valuable information from the resources an expert government decision-maker invests in explaining and defending its decision. The costly signaling theory of hard look review posits that the government’s willingness to incur these additional costs allows the court to draw more accurate inferences about what, if anything, the government has learned about policy-relevant factual questions on which the court lacks information.

As a positive matter, the costly signaling theory provides an account of observed patterns of judicial and government behavior and implies several additional hypotheses. As a normative matter, what one thinks about the desirability of hard look review, if it does function as a signaling device, depends in large part on what one thinks about whether it is a good thing or a bad thing for policy to conform more closely to judicial preferences. If one believes that judicial values are closer to social values or some other normative benchmark, judicial use of record quality as a costly signal may be desirable. Moreover, the costly signaling argument suggests a response to those who would critique hard look review on the grounds that judges’ lack of expertise renders them incompetent to review decisions by other government actors.¹⁴¹ If, on the other hand, one thinks that

¹⁴⁰ Testing the latter hypothesis is complicated, however, by the fact that the decision whether to adopt a telephonic warrant application process is endogenous, and unobserved jurisdiction-specific variables are likely to influence both whether such a procedure is put in place and other aspects of the warrant application process.

¹⁴¹ There are, of course, other critiques of judicial competence that do not depend on informational asymmetries. For example, courts may suffer from cognitive or perceptual biases that lead to systematic errors, even if judges have the “right” preferences and all relevant information. *See* Rachlinski & Farina,

judicial policy preferences should not constrain decisions by other government actors, then one might take a more pessimistic view of devices like hard look review that judges can use to induce other government actors to hew more closely to the judges' values under the guise of more innocuous-seeming demands that the government demonstrate that its action is "reasonable" or "supportable."

Another aspect of the normative assessment of the costly signaling account of hard look review concerns the social costs associated with the resources the government sinks into preparing a record. It may be that these costs, though significant to the government, are socially unimportant. This might be the case if, for example, the resources the government diverts to record preparation would otherwise have been spent on activities that are trivial or wasteful from a social perspective, such as more leisure time or perks for government bureaucrats. On the other hand, if the resources devoted to record preparation are diverted from socially valuable activities – perhaps because these resources would otherwise be devoted to different regulatory activities, or perhaps because the necessary resources must be acquired through additional taxation – then the social inefficiency associated with reliance on record quality as a costly signal may be substantial. Article, I do not take a position on these normative questions. My main purpose here is not to argue that costly signaling through record quality is good or bad, but rather to identify it as a plausible account for many of the behavior patterns associated with hard look review. If the theory does capture some important positive aspect of hard look review, then this may well have important implications for related normative debates, but resolving these debates – and giving providing a bottom-line assessment of whether hard look review as currently practiced is good or bad – would require both a richer model that reintroduces complications this Article has deliberately simplified away and a resolution of debates over values on which this Article offers no specific guidance. This Article has argued that we should not necessarily assume, when courts review the explanations or justifications offered by government decision-makers, that the courts are either learning valuable information from the content of the explanations or that the exercise is a meaningless charade. While these are both possibilities, it is also possible that the court, perhaps unconsciously, is learning from its evaluation of the quality of the record something about how much the government cared about implementing this particular decision, and this in turn signals something to the court about the government's decision-relevant information. Though this Article has focused on judicial review of government decisions, the costly signaling dynamic may have applications to judicial review in other contexts as well. For example, appellate review of lower court decisions may sometimes involve evaluation of the effort that the lower court invested in defending its findings. Similarly, judicial review of certain types of private decisions, for example in corporate law and employment law, sometimes entails scrutiny of the reasons offered for those decisions. It is possible that the costly signaling argument provides some insight into the extent and nature of judicial review in these contexts as well. More

supra note 32, at 577-78; see also Cross, *supra* note 43 at 1315 -22 (describing structural and doctrinal biases of the litigation process). The thesis advanced in this Article does not engage such claims directly, just as it does not engage claims of cognitive bias on the agency side. See, e.g., Rachlinski & Farina, *supra* note 32, at 579-80; Seidenfeld, *supra* note 32.

generally, the costly signaling function of hard look review may be an illustrative example of how particular doctrines, practices, or behavior patterns serve functional ends but do so in ways that differ in important respects from the ways in which those doctrines and practices are conventionally understood and defended. This suggests a broader line of research into indirect mechanisms of communication between legislatures, agencies, courts, and other public or private parties.

APPENDIX

A. Model Assumptions

Assume there is a decision-maker A (e.g., an agency) that can be one of two types, $\theta \in \{1,0\}$. With probability $p \in [0,1]$, $\theta = 1$ (the agency is “informed”), and with probability $1-p$, $\theta = 0$ (the agency is “uninformed”). Parameter p can be thought of as a measure of the agency’s expertise. The agency must choose action $z_A \in \{0,1\}$, e.g., to maintain the status quo ($z_A = 0$) or to regulate ($z_A = 1$). If the agency chooses to regulate, it sends pays unobservable cost $x \geq 0$, which generates a public signal (e.g., a record of a particular quality), $s = \frac{x}{1+(1-\theta)t}$. Parameter $t \geq 0$, which is common

knowledge, captures the possibility that uninformed agencies may have higher marginal signaling costs than informed agencies. If the agency regulates, a reviewer C (e.g., a court) must choose action $z_C \in \{0,1\}$, e.g., to strike down the regulation ($z_C = 0$) or to uphold it ($z_C = 1$). The court knows p but does not observe whether the agency is informed. The final action is $z = z_A z_C$. If $z = 0$, the agency and the court receive status quo payoffs normalized to zero. If $z = 1$, the agency receives payoff $b - (1-\theta)k(b)$ and the court receives payoff $b - (1-\theta)k(b) - j + \varepsilon$. Parameter b , the “payoff” of regulation, is a random variable with distribution F . If but only if the agency is informed, it observes b before choosing whether to regulate. The court does not observe b , though it knows the distribution F . Function $k(b) \geq 0$, which is common knowledge, captures the fact that uninformed agencies may regulate less efficiently than informed agencies. Define parameter μ as the agency’s expected benefit from uninformed regulation (i.e., $E(b - k(b))$). Parameter j captures the systematic preference divergence between the agency and the court regarding the desirability of regulation: If $j > 0$, the court is more hostile to regulation than the agency; if $j < 0$, the court is more sympathetic to regulation than the agency. Finally, parameter ε is a random variable drawn from a distribution with mean 0. This parameter captures the possibility that the amount of preference divergence between the court and the agency may have a random component – for example, a particular regulation may have a higher than average benefit to the agency that does not accrue to the court (low ε) because this particular regulation will advance goals that the agency views as important but the court views as irrelevant.

The agency’s final utility, given the above, is $U_A = z[b - (1-\theta)k(b) - s(1+(1-\theta)t)]$. The court’s final utility is $U_C = z[b - (1-\theta)k(b) - j + \varepsilon]$. To resolve ties, I assume that if $E(U_A | z = 1) = E(U_A | z = 0) = 0$, then the agency chooses $z_A = 0$, and if $E(U_C | z = 1) = E(U_C | z = 0) = 0$, the court chooses $z_C = 1$.

To sum up, the model consists of the following steps:

- *Step 1:* Nature chooses θ from distribution $\left\{ \begin{array}{l} \Pr(\theta = 1) = p \\ \Pr(\theta = 0) = 1 - p \end{array} \right\}$, and chooses b from distribution F .
- *Step 2:* A observes θ . If $\theta = 1$, A also observes b .
- *Step 3:* A chooses $z_A = \{0,1\}$. If $z_A = 0$ the proceeds immediately to Step 7.
- *Step 4:* A chooses $x \geq 0$.
- *Step 5:* C observes s .
- *Step 6:* C chooses $z_C = \{0,1\}$
- *Step 7:* A receives utility $U_A = z[b - (1 - \theta)k(b) - s(1 + (1 - \theta)t)]$, and C receives utility $U_C = z[b - (1 - \theta)k(b) - j + \varepsilon]$.

B. Equilibrium Solution Concept

The preceding assumptions describe a signaling game in which the agency has private information (θ in all cases and b if $\theta = 1$) and can send a costly signal, s , to the court. The following analysis identifies pure strategy perfect Bayesian equilibria (PBE) of this game, subject to two equilibrium refinements.

First, I assume that if the court observes the agency make an out-of-equilibrium choice (in particular, if the agency regulates and selects an s value for which the court's equilibrium strategy calls for it to strike down the regulation) then the court assumes that the agency incorrectly believed the court would uphold the regulation, but that otherwise the agency is rational.

Second, I assume that the PBE selected will be the PBE in which (1) the agency either (a) chooses not to regulate or (b) chooses to regulate and selects the minimum s necessary to induce the court to uphold regulation; and (2) the court chooses to uphold regulation if but only if $E(U_C | s) \geq 0$. In other words, I focus on the equilibrium in which the agency never sends a signal more costly than necessary for the court to infer that the court's expected utility from upholding regulation is non-negative, and the court upholds regulation if but only if it expects this will give it non-negative utility. This is the least-cost separating PBE (LCS-PBE), so called because it is the separating equilibrium in which signal costs (x) are lowest.

C. Analysis

The LCS-PBE will be one of three possibilities, with the actual LCS-PBE dependent on the values of the parameters. In one type of equilibrium, the agency will regulate even if uninformed. Define s_1^* as the minimum s necessary for the court to uphold regulation in the case where, by assumption, an uninformed agency would choose to regulate. The condition that an uninformed agency would regulate, however, holds only if the signaling cost for an uninformed agency, $x = s_1^*(1+t)$, is less than the expected benefit of

uninformed regulation, μ . Therefore, the equilibrium signal sent by a regulating agency, denoted s^* , will be s_1^* if but only if $s_1^* < \frac{\mu}{1+t}$. If this condition does not hold, then the LCS-PBE will be one of two other possibilities. Define s_2^* as the minimum s necessary for the court to uphold regulation if an uninformed agency would not regulate. Again, the condition that an uninformed agency will not regulate is satisfied if but only if the equilibrium signal $s^* \geq \frac{\mu}{1+t}$. If $s_2^* \leq \frac{\mu}{1+t}$, then the agency induce the court to uphold regulation if it chooses $s = \frac{\mu}{1+t}$, because by assumption a signal of this quality suffices to demonstrate that the agency is informed. In the case where an agency must demonstrate that it is informed in order for the court to uphold regulation (i.e., $s_1^* \geq \frac{\mu}{1+t}$), but a signal minimally sufficient to establish that the agency is informed is enough for the court to uphold regulation (i.e., $s_2^* \leq \frac{\mu}{1+t}$), then the equilibrium signal sent by a regulating agency will be $s^* = \frac{\mu}{1+t}$. If, on the other hand, a signal equal to $\frac{\mu}{1+t}$ is insufficient for the court to uphold regulation (i.e., $s_2^* > \frac{\mu}{1+t}$), then the equilibrium signal sent by a regulating agency will be $s^* = s_2^*$. The following proposition demonstrates this result formally and characterizes s_1^* and s_2^* .

Proposition 1: The three possible LCS-PBEs of the game, and the mutually exclusive conditions that sustain each of them, are as follows:

(a) Define s_1^* as the minimum s that solves $\frac{p(1-F(s))E(b|b>s)+(1-p)\mu}{1-pF(s)} \geq j$. If

$s_1^* < \frac{\mu}{1+t}$, then the following strategy profiles comprise the LCS-PBE:

- A: Choose $z_A = 1$ and $s = s_1^*$ if $\theta = 0$ or if $\theta = 1$ and $b > s_1^*$ (note that if $\theta = 1$ the explanation cost to A is s_1^* and if $\theta = 0$ the explanation cost is $(1+t)s_1^*$); choose $z_A = 0$ otherwise;
- C: Choose $z_C = 1$ if $s \geq s_1^*$; choose $z_C = 0$ otherwise.

(b) Define s_2^* is the minimum s that solves $E(b|b>s) = j$. If $s_1^* > \frac{\mu}{1+t}$ and

$s_2^* \geq \frac{\mu}{1+t}$, then the following strategy profiles comprise the LCS-PBE:

- A: Choose $z_A = 1$ and $s = s_2^*$ if $\theta = 1$ and $b > s_2^*$; choose $z_A = 0$ otherwise;
 - C: Choose $z_C = 1$ if $s \geq s_2^*$; choose $z_C = 0$ otherwise.
- (c) If $s_1^* > \frac{\mu}{1+t}$ and $s_2^* < \frac{\mu}{1+t}$, then the following strategy profiles comprise the LCS-PBE:
- A: Choose $z_A = 1$ and $s = \frac{\mu}{1+t}$ if $\theta = 1$ and $b > \frac{\mu}{1+t}$; choose $z_A = 0$ otherwise;
 - C: Choose $z_C = 1$ if $s \geq \frac{\mu}{1+t}$; choose $z_C = 0$ otherwise.

Proof:

- (a) The strategy profiles described in Proposition 1(a) comprise the LCS-PBE given the specified conditions:
- Define q as C 's posterior estimate of the probability that $\Pr(\theta = 1 | z_A = 1)$. $E(U_C | z = 1) = qE(b | \theta = 1, z_A = 1) + (1 - q)\mu - j$. By Bayes' Rule, $q = \frac{\Pr(z_A = 1 | \theta = 1)\Pr(\theta = 1)}{\Pr(z_A = 1 | \theta = 1)\Pr(\theta = 1) + \Pr(z_A = 1 | \theta = 0)\Pr(\theta = 0)}$. By definition, $\Pr(\theta = 1) = p$ and $\Pr(\theta = 0) = 1 - p$. Given A 's equilibrium strategy, C can assume that $\Pr(z_A = 1 | \theta = 1) = \Pr(b > s_1^*) = 1 - F(s_1^*)$ and that $\Pr(z_A = 1 | \theta = 0) = 1$. Therefore, $q = \frac{p(1 - F(s_1^*))}{1 - pF(s_1^*)}$, so $E(U_C | z = 1) = \frac{p(1 - F(s_1^*))E(b | b > s_1^*) + (1 - p)\mu}{1 - pF(s_1^*)} - j$. This is non-negative if, but only if, $\frac{p(1 - F(s_1^*))E(b | b > s_1^*) + (1 - p)\mu}{1 - pF(s_1^*)} \geq j$. C therefore has no incentive to deviate from its equilibrium strategy.
 - If $\theta = 0$, then if A selects $z_A = 1$ and $x = (1 + t)s_1^*$ (resulting in signal $s = s_1^*$), C will select $z_C = 1$, and A 's expected utility will be $\mu - (1 + t)s_1^* > 0$. If, given that $\theta = 0$, A were to select a higher x , $(1 + t)s_1^* + \varepsilon$, A 's expected utility would be $\mu - (1 + t)s_1^* - \varepsilon < \mu - (1 + t)s_1^*$. If A were to select a lower x , $(1 + t)s_1^* - \varepsilon$, the signal sent would be $s = \frac{(1 + t)s_1^* - \varepsilon}{1 + t} < s_1^*$, so C would select $z_C = 0$ and A 's utility would be $-(1 + t)s_1^* + \varepsilon < 0$. Therefore, A has no incentive to deviate from its equilibrium strategy when $\theta = 0$.
 - If $\theta = 1$, then if A observes $b > s_1^*$ and chooses $z_A = 1$ and $s = s_1^*$, A 's expected utility is $b - s_1^* > 0$. For reasons parallel to those given above, A cannot improve

its payoff by choosing an s greater or less than s_1^* . Therefore, A has no incentive to deviate from its equilibrium strategy when $\theta = 1$ and $b > s_1^*$.

- If $\theta = 1$ and A observes $b \leq s_1^*$, then A 's net payoff cannot exceed 0. If A selects $z_A = 1$ and $s < s_1^*$, C will choose $z_C = 0$, giving A a final utility of $-s$. If A selects $z_A = 1$ and $s \geq s_1^*$, C will choose $z_C = 1$, giving A a final utility of $b - s_1^* \leq 0$. Therefore, A has no incentive to deviate from its equilibrium strategy when $\theta = 1$ and $b < s_1^*$.
- The above is sufficient to demonstrate not only that this PBE exists under the specified conditions, but that if it exists it is the LCS-PBE. Any similar candidate PBE in which the threshold value $s^* < s_1^*$ does not achieve separation, because it is irrational in such a case for C to choose $z_C = 1$ for any $s < s_1^*$. Any candidate equilibrium in which C chooses $z_C = 1$ only if it observes a signal $s^* > s_1^*$ by definition entails a higher signal cost than the equilibrium in which C chooses $z_C = 1$ if it observes a signal $s \geq s_1^*$, and so cannot be the LCS-PBE.

(b) The equilibrium described in Proposition 1(b) is the LCS-PBE given the specified conditions:

- Given A 's equilibrium strategy, C 's posterior probability estimate $\Pr(\theta = 1 | z_A = 1) = 1$. Therefore, $E(U_C | z = 1) = E(b | b > s_2^*) - j$, which is non-negative if but only if $E(b | b > s_2^*) > j$. C therefore has no incentive to deviate from its equilibrium strategy.
- If $\theta = 0$, then if A chooses $z_A = 1$ and any $x < (1+t)s_2^*$, C will observe $s < s_2^*$ and will select $z_C = 0$. A 's expected payoff will therefore be $-x \leq 0$. If A chooses $z_A = 1$ and any $x \geq (1+t)s_2^*$, C will observe $s \geq s_2^*$ and will select $z_C = 1$. This gives A expected payoff $\mu - (1+t)s_2^* \leq 0$. Therefore, A has no incentive to deviate from its equilibrium strategy when $\theta = 0$.
- If $\theta = 1$ and A observes $b \leq s_2^*$, A 's utility from choosing $z_A = 1$ is $-x \leq 0$ if $x < s_2^*$ and is $b - x \leq 0$ if $x \geq s_2^*$. Therefore, A has no incentive to deviate from its equilibrium strategy when $\theta = 1$ and $b \leq s_2^*$.
- If $\theta = 1$ and A observes $b > s_2^*$, then A 's payoff if it chooses $s = s_2^*$ is $b - s_2^* > 0$. If A chooses a lower s , $s_2^* - \varepsilon$, then in equilibrium C will choose $z_C = 0$, giving A utility $-s_2^* + \varepsilon \leq b - s_2^*$. If A chooses a higher s , $s_2^* + \varepsilon$, C will choose $z_C = 1$ and A 's payoff will be $b - s_2^* - \varepsilon < b - s_2^*$. Therefore, A has no incentive to deviate from its equilibrium strategy when $\theta = 1$ and $b > s_2^*$.

- The condition that $s_1^* > \frac{\mu}{1+t}$ means there is no PBE in which C will choose $z_C = 1$ if its posterior estimate of $\Pr(\theta = 1) < 1$. Therefore, in order for a PBE to exist when $s_1^* > \frac{\mu}{1+t}$, two requirements must be satisfied. First, it must be the case that C 's posterior estimate $\Pr(\theta = 1 | z_A = 1) = 1$. The minimum s that satisfies this requirement is $\max\left\{0, \frac{\mu}{1+t}\right\}$, because this s value implies an x sufficiently large to eliminate any positive expected value an uninformed A might otherwise obtain from $z = 1$. Second, it must be the case that C 's posterior expected value $E(b | z_A = 1) \geq j$. The minimum s that satisfies this condition is s_2^* by definition. Because both of these conditions must be satisfied for the candidate PBE to exist, only one of them will bind (except where $s_2^* = \max\left\{0, \frac{\mu}{1+t}\right\}$), and the binding condition determines which PBE is LCS. When $s_2^* > \frac{\mu}{1+t}$, only the second condition binds. Therefore, the PBE described in Proposition 1(b) is the LCS-PBE given the conditions specified.

(c) The equilibrium described in Proposition 1(c) is the LCS-PBE given the specified conditions:

- Because of A 's equilibrium strategy, C can infer that, if $z_A = 1$ and $s \geq \frac{\mu}{1+t}$, then $\theta = 1$ and $b > \frac{\mu}{1+t}$. Therefore, C 's expected payoff from choosing $z_C = 1$ is $E\left(b | b > \frac{\mu}{1+t}\right) - j$. Given (a) that by definition $E(b | b > s_2^*) \geq j$; (b) the condition that $\frac{\mu}{1+t} > s_2^*$; and (c) the fact that $\frac{dE(b | b > s)}{ds} \geq 0$, it follows that $E\left(b | b > \frac{\mu}{1+t}\right) > j$. Therefore, C has no incentive to deviate from its equilibrium strategy if $s \geq \frac{\mu}{1+t}$.
- If $\theta = 0$, then if A chooses $z_A = 1$ and any $x < \mu$, C will observe $s < \frac{\mu}{1+t}$ and will select $z_C = 0$. A 's expected payoff will therefore be $-x \leq 0$. If A chooses $z_A = 1$ and any $x \geq \mu$, C will observe $s \geq \frac{\mu}{1+t}$ and will select $z_C = 1$. This

gives A an expected payoff no greater than 0. Therefore, A has no incentive to deviate from its equilibrium strategy when $\theta = 0$.

- If $\theta = 1$ and A observes $b \leq \frac{\mu}{1+t}$, A 's utility from choosing $z_A = 1$ is $-x \leq 0$ if $x < \frac{\mu}{1+t}$ and is $b - x \leq 0$ if $x > \frac{\mu}{1+t}$. Therefore, A has no incentive to deviate from its equilibrium strategy when $\theta = 1$ and $b \leq \frac{\mu}{1+t}$.
- If $\theta = 1$ and $b > \frac{\mu}{1+t}$, A 's payoff from choosing its equilibrium strategy, $z_A = 1$ and $s = \frac{\mu}{1+t}$, is $b - \frac{\mu}{1+t} > 0$. If A were to choose a higher s , C will still choose $z_C = 1$ but A 's payoff will be lower; if A were to choose a lower s , C would choose $z_C = 0$ and A 's payoff would be no greater than 0. A therefore has no incentive to deviate from its equilibrium strategy when $\theta = 1$ and $b > \frac{\mu}{1+t}$.
- The difference between this case and that described in Proposition 1(b) is that in this case the binding condition is the requirement that C must be able to infer with probability 1 that $\theta = 1$. The minimum s which satisfies this condition is $s = \frac{\mu}{1+t}$. Because of the condition that $s_2^* < \frac{\mu}{1+t}$, $s = \frac{\mu}{1+t}$ is also sufficient to guarantee C a nonnegative expected utility if A chooses $z_A = 1$. Therefore, this equilibrium is the LCS-PBE under the specified conditions.

D. Comparative Statics

Recall that $s^* \in \left\{ s_1^*, s_2^*, \frac{\mu}{1+t} \right\}$ is the signal the agency sends in equilibrium when it chooses to regulate. We would like to know how s^* varies as the other parameters (j , p , t , and μ) change. Before considering each of these four relationships, it is useful to establish the following two lemmas.

Lemma 1: If $s^* = s_1^* > 0$, then $j > s_1^*$.

Proof: Suppose $s_1^* = \hat{s} > j$. It follows immediately from this that $E(b | b > \hat{s}) > j$. The fact that $s^* = s_1^* > 0$ implies that $s_1^* = \hat{s} < \frac{\mu}{1+t} \Rightarrow \hat{s} < \mu$. This, coupled with the assumption that $\hat{s} > j$, implies that $\mu > j$. The fact that $\hat{s} = s_1^* > 0$ implies that $p(1 - F(\hat{s}))E(b | b > \hat{s}) + (1 - p)\mu = j(1 - pF(\hat{s}))$, which can be rewritten as

$p(1 - F(\hat{s}))(E(b | b > \hat{s}) - j) = (1 - p)(j - \mu)$. The right-hand side of this equality must be negative, but the left-hand side must be non-negative. Therefore, we have a contradiction.

Lemma 2: If $\mu \geq j$, then $s^* = 0$.

Proof: If A selects $z_A = 1$ and $s^* = 0$, C's expected payoff from selecting $z_C = 1$ is $\Pr(\theta = 0 | s^* = 0)\mu + \Pr(\theta = 1 | s^* = 0)E(b | b > 0) - j$. Because $E(b | b > 0) \geq E(b) = \mu$, $E(b | b > 0)$ can be rewritten as $\mu + \alpha$, where $\alpha \geq 0$. C's expected payoff from selecting $z_C = 1$ when A selects $z_A = 1$ and $s^* = 0$ can therefore be rewritten as $\mu - j + \Pr(\theta = 1 | s^* = 0)\alpha$, which is always non-negative if $\mu \geq j$. From this it follows that, if $\mu \geq j$, then C chooses $z_C = 1$ if $s^* = 0$. A, therefore, has no incentive to select any $s^* > 0$, as doing so reduces A's utility without affecting C's behavior.

Remark 1: The j parameter is positively correlated with s^* over a range of parameter values; outside that range, j is uncorrelated with s^* . First, using the implicit function theorem and Lemma 1, we know that if $n_1 \geq 0$, $\frac{\partial s_1^*}{\partial j} = \frac{1 - pF(s_1^*)}{pf(s_1^*)(j - s_1^*)} \geq 0$. This implies that, over the range of parameter values for which the equilibrium signal is $s^* = s_1^* > 0$, increases in j increase s_1^* . Consequently the range of parameter values for which $s^* = s_1^*$ decreases because, for some parameter values, the increase in j will raise s_1^* above the threshold value $\frac{\mu}{1+t}$. Second, invoking the implicit function theorem and the fact that $E(b | b > s_2^*) = j \Rightarrow s_2^* \leq j$, we know that $\frac{\partial s_2^*}{\partial j} = \frac{1 - F(s_2^*)}{f(s_2^*)(j - s_2^*)} \geq 0$. Therefore, increases in j increase the value of s_2^* in the range where $s^* = s_2^*$. For this reason, increases in j also increase the range of parameter values for which s^* is s_2^* rather than $\frac{\mu}{1+t}$. If $s^* = \frac{\mu}{1+t}$, changes in j have no effect on s^* .

Remark 2: Over the range of parameter values for which $s^* = s_1^* > 0$, p is negatively correlated with s^* . By the implicit function theorem we know that

$$\frac{\partial s_1^*}{\partial p} = \frac{\mu - jF(s_1^*) - \int_{s_1^*}^{\infty} yf(y)dy}{pf(s_1^*)(j - s_1^*)} = \frac{\mu - jF(s_1^*) - E(b | b > s_1^*)(1 - F(s_1^*))}{pf(s_1^*)(j - s_1^*)} < 0. \text{ This is easier to see}$$

if we rewrite the expression as $\frac{\partial s_1^*}{\partial p} = \frac{F(s_1^*)(\mu - j) - (1 - F(s_1^*))(E(b | b > s_1^*) - \mu)}{pf(s_1^*)(j - s_1^*)}$. The denominator is positive (Lemma 1). The numerator is negative in light of the fact that for all $s_1^* > 0$ it must be the case that $j > \mu$ (Lemma 2) and that, by definition, $E(b | b > s_1^*) \geq E(b) = \mu$. If $s^* = \max\left\{s_2^*, \frac{\mu}{1+t}\right\}$, then p is uncorrelated with s^* .

Remark 3: Increases in t decrease $\frac{\mu}{1+t}$, the threshold signal value above which C can infer with probability 1 that $\theta = 1$ if $z_A = 1$. This has the effects of (a) reducing the range of parameter values for which $s^* = s_1^*$; (b) increasing the range of parameter values for which $s^* = s_2^*$; and (c) decreasing s^* when $s^* = \frac{\mu}{1+t}$. The t parameter therefore is either a negatively correlated or uncorrelated with s^* . As long as $\frac{\mu}{1+t} > s_2^*$ (that is, as long as a signal sufficient to guarantee that $\theta = 1$ is also sufficient to guarantee that $E(b | z_A = 1) \geq j$) then increases in t decrease s^* , but only to a floor equal to s_2^* . As soon as $\frac{\mu}{1+t} \leq s_2^*$, further increases in t have no effect.

Remark 4: If $s^* = s_1^* > 0$, then $\frac{\partial s_1^*}{\partial \mu} = \frac{p-1}{pf(s_1^*)(j-s_1^*)} < 0$. Thus, as μ increases, s_1^* decreases (to a minimum of 0). Also, as μ increases, the range of parameter values for which $s^* = s_1^*$ increases. This occurs not only because increases in μ decrease s_1^* , but also because they increase the threshold value $\frac{\mu}{1+t}$. If $s_1^* > \frac{\mu}{1+t}$, increases in μ increase s^* if $\frac{\mu}{1+t} > s_2^*$, which also increases the range of parameter values for which $\frac{\mu}{1+t} > s_2^*$. So, μ may be positively correlated, negatively correlated, or uncorrelated with s^* . When μ is sufficiently low, $s^* = s_2^*$, which is unaffected by μ . If μ increases to the point where $s_1^* > \frac{\mu}{1+t} > s_2^*$, then further increases in μ will increase $s^* = \frac{\mu}{1+t}$. But as soon as μ increases to the point where $\frac{\mu}{1+t} > s_1^*$, then further increases in μ will decrease $s^* = s_1^*$. (If $s_1^* < s_2^*$, then there is no range over which increases in μ increase equilibrium explanation costs.)