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A Costly Signaling Theory of “Hard Look” Judicial Review

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ARTICLE

A COSTLY SIGNALING THEORY OF “HARD LOOK” JUDICIAL REVIEW

MATTHEW C. STEPHENSON*

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INTRODUCTION

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 decisionmaker'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 puzzling concern 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 decisionmakers, 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 decisionmaking and the perceived need for a judicial check. This proposed reconciliation, however, is problematic. The same lack of

1. The term "hard look" review was coined by Judge Harold Leventhal of the D.C. Circuit. See *Pikes Peak Broad. 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 *Nat'l Lime Ass'n v. EPA*, 627 F.2d 416, 451 n.126 (D.C. Cir. 1980).

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 also have raised serious questions about whether the kind of lawyerly rationality demanded by reviewing courts has any particularly strong connection to substantively rational policymaking. Therefore, in those cases in which 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 decisionmakers. 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 prove true, then the court can reason that the expert government decisionmaker's willingness to produce a high-quality explanation signals that the government believes the benefits of the proposed policy are high. The fact that the government views the policy as high-value implies that the policy is more likely to be acceptable to the court, given the assumption that the preferences of the court and the government are positively correlated in expectation. Judicial evaluation of the quality of the government's explanation thus 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, *Advertising as Information*, 82 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 generally Hans Gersbach, *The Money-Burning Refinement: With an Application to a*

This hypothesis provides an alternative perspective on the institutional relationship between generalist reviewing courts and expert government decisionmakers. 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 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 legal system has developed to mitigate informational asymmetries and to preserve meaningful checks and balances. Costly signaling through the quality of the government's 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 public law institutions.

This Article develops the costly signaling explanation for hard look review, using judicial review of administrative agency regulations as a paradigm. 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 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.

Political Signaling Game, 33 INT'L J. GAME THEORY 67 (2004). Some legal scholars have suggested applications of this type of model that are similar to the argument developed in this Article. See Jason Scott Johnston, *A Game Theoretic Analysis of Alternative Institutions for Regulatory Cost-Benefit Analysis*, 150 U. PA. L. REV. 1343, 1368-69 (2002) (suggesting that lobbying by regulatory targets can signal their compliance costs); *id.* at 1376-77 (suggesting that a requirement that agencies conduct costly regulatory analyses screens out low-value regulations); Eric A. 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 a proposed regulation has a high value); Emerson H. Tiller, *Resource-Based Strategies in Law and Positive Political Theory: Cost-Benefit Analysis and the Like*, 150 U. PA. L. REV. 1453, 1459 (2002) (noting that the "essence of [hard look review] is to attack the reasoning processes 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").

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 a range of public law applications. 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 decisionmaking: judicial review of agency regulations under the Administrative Procedure Act (APA), the more specific review provisions contained in particular statutes, or both.

The delegation of substantial discretion to administrative agencies is often justified in terms of agencies' superior expertise and insulation from the undesirable effects of legislative politics.³ 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 degree of political control by both the president and Congress.⁵ Nonetheless, concerns about unchecked administrative governance have given rise to the view that, as Louis Jaffe famously put it, 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 its own institutional limitations 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

3. See James M. Landis, *The Administrative Process*, in AMERICAN LEGAL REALISM 159-61 (William W. Fisher III et al. eds., 1993); David B. Spence & Frank Cross, *A Public Choice Case for the Administrative State*, 89 GEO. L.J. 97, 99-100 (2000).

4. See generally THEODORE J. LOWI, *THE END OF LIBERALISM: THE SECOND REPUBLIC OF THE UNITED STATES* (2d ed. 1979); DAVID SCHOENBROD, *POWER WITHOUT RESPONSIBILITY: HOW CONGRESS ABUSES THE PEOPLE THROUGH DELEGATION* (1993).

5. On presidential control of the administration, see, for example, Elena Kagan, *Presidential Administration*, 114 HARV. L. REV. 2245 (2001); Terry M. Moe & Scott A. Wilson, *Presidents and the Politics of Structure*, 57 LAW & CONTEMP. PROBS. 1 (1994); Terry M. Moe, *An Assessment of the Positive Theory of "Congressional Dominance"*, 12 LEGIS. STUD. Q. 475 (1987). On congressional oversight, see, for example, JOEL D. ABERBACH, *KEEPING A WATCHFUL EYE: THE POLITICS OF CONGRESSIONAL OVERSIGHT* (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. 431 (1989); Mathew D. McCubbins & Thomas Schwartz, *Congressional Oversight Overlooked: Police Patrols versus 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 L. JAFFE, *JUDICIAL CONTROL OF ADMINISTRATIVE ACTION* 320 (1965).

7. 5 U.S.C. § 706(2)(A) (2000).

Reviewing courts might 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 of both institutional legitimacy and 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 the judicial check on agency policymaking.

Rather than adopting either of these extremes, the courts have charted a different course. The courts have shifted the emphasis of review under 5 U.S.C. § 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 supporting that decision.⁸ Thus, while the Supreme Court has instructed that a reviewing court must not “substitute its judgment for that of the agency,”⁹ it also has instructed that the reviewing court should 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 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 also may occur in cases of non-judicial review of

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, 411-12 (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, 527-28 (1997) [hereinafter McGarity, *Ossification*]; Thomas O. McGarity, *Some Thoughts on “Deossifying” the Rulemaking Process*, 41 DUKE L.J. 1385, 1400, 1410-11 (1992) [hereinafter McGarity, *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).

10. *Id.*

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, 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 (2d Cir. 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.

agency action, such as regulatory review by the Office of Management and Budget (OMB).¹³

Although there is considerable variation in how courts apply the hard look standard, many of the opinions follow a similar pattern. Typically, the court begins by invoking the general principle that the judicial role is limited to assessing whether the agency acted reasonably. Then, the court evaluates the agency's evidence and arguments for its more controversial conclusions. This inquiry usually tracks the main objections of the aggrieved parties. More often than not, significant agency regulations survive hard look review,¹⁴ but in many 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 forty-five pages of which were devoted to an evaluation of the arguments and evidence that EPA advanced in favor of its approach.¹⁶ The opinion emphasized 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 was evident in *United 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 fifty micrograms per cubic meter was reasonably necessary to prevent a significant and material risk to human health.¹⁸ The court

13. One might argue that Office of Management and Budget (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. While 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, especially given the fact that OMB has limited staff and resources relative to the agencies it reviews. See Thomas O. McGarity, *Regulatory Analysis and Regulatory Reform*, 65 TEX. L. REV. 1243, 1276-86 (1987). For the application of a signaling argument, similar to the one developed in this Article, to 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, 396 (2000); Patricia M. Wald, *Judicial Review in Midpassage: 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. *Id.* at 322-39, 347-51, 360-73, 377-84.

17. *Id.* at 410.

18. 647 F.2d 1189, 1244-63 (D.C. Cir. 1980). The court reviewed OSHA's decision under a "substantial evidence" standard, *id.* at 1206-07, rather than the arbitrary and capricious standard of review in 5 U.S.C. § 706(A)(2) because the Occupational Safety and Health Act specifically provides that OSHA's determinations "shall be conclusive if supported by substantial evidence in the record as a whole." 29 U.S.C. § 655(f) (2000). This standard, like the arbitrary and capricious standard, has been treated by courts as

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 after providing an extensive sixteen-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 verifying that the agency has provided a lengthy discussion and analysis of the key issues.

In a few high-profile cases, courts have found agency explanations deficient under the hard look standard. In these cases, the reviewing court often indicates what the agency would need to do—usually more, or more elaborate, research and analysis—to satisfy that 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 the EPA 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 Circuit not only found that the EPA failed

calling for a “hard look” at the agency’s decision. *See, e.g., Bldg. & 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 Administrative Procedure Act’s (APA) arbitrary and capricious standard and the substantial evidence standard mandated by the Occupational Safety and Health Act, given the similarity of the judicial approach in both 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 permissible exposure limit (PEL), the court did find that there was insufficient evidence in the record to support OSHA’s determination that the standard was technically and economically feasible for certain industries. *Id.* at 1294-1308. OSHA addressed this problem in regulations announced in subsequent rulemaking proceedings, most but not all of which were upheld. *See Am. Iron & Steel Inst. v. OSHA*, 939 F.2d 975 (D.C. Cir. 1991).

23. 947 F.2d 1201, 1201 (5th Cir. 1991).

24. *Id.* at 1214, 1229. 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 capricious” standard contained in the APA. 15 U.S.C. § 2618(c)(1)(B)(i) (2000). *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 APA

adequately to consider alternatives, but also expressed "concern[s] about some of the methodology employed by EPA" and indicated that, if the 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 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 Although 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 the statute required this sort of analysis.³⁰

Defenders of hard look review, including the courts that employ it, 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 decisionmaking biases to which agencies are thought to be vulnerable.³²

review. *See id.* at 1214 ("[An agency] must cogently explain why it has exercised its discretion in a given manner 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, 965 (11th Cir. 1992).

28. *Id.* at 975.

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 R. 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 R. Sunstein, *On the Costs and Benefits of Aggressive Judicial Review of Agency Action*, 1989 DUKE L.J. 522, 527-29 [hereinafter Sunstein, *Costs and Benefits*]; Patricia M. Wald, *Judicial Review of Complex Administrative Agency Decisions*, 462 ANNALS AM. ACAD. POL. & SOC. SCI. 72, 77 (1982).

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);

Sometimes the claim is framed as a more general argument that hard look review encourages agencies to engage in a superior (for example, more comprehensively rational or more deliberative) decisionmaking process.³³ 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 since it prevented the 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 basis for its regulation—has a positive effect on regulatory quality. The argument presumes—sometimes implicitly, sometimes explicitly—that hard look review of the agency's evidence and explanation 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 scientific, economic, social, and political analyses.³⁷ The fact that

Sargentich, *supra* note 8, at 631-32; Shapiro & Levy, *supra* note 8, at 412-13; Cass R. Sunstein, *Constitutionalism After the New Deal*, 101 HARV. L. REV. 421, 469 (1987); Cass R. Sunstein, *Interest Groups in American Public Law*, 38 STAN. L. REV. 29, 63 (1985) [hereinafter Sunstein, *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" decisionmaking, 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. 763, 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 R. Sunstein, *Cost-Benefit Default Principles*, 99 MICH. L. REV. 1651, 1682 (2001).

35. See *id.* at 1714 (criticizing the Fifth Circuit's analysis of discount rates).

36. See *id.* at 1711; see also Cass R. Sunstein, *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); Sunstein, *Defense*, *supra* note 31, at 53 ("Some 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.")

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

the agency was able to supply 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 agency decisionmaking 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 adequate to satisfy a reviewing court. This record-generation activity, however, may have little connection to the actual decisionmaking process.³⁸ Moreover, 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

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) (explaining that the reason for the success of many administrative challenges lies in the agencies' failure to effectively communicate the reasons for their actions).

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 such dishonest justifications 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 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 Pierce, *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 hard look review sometimes produces unintended effects, though they argue these cases are exceptional. See 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 (arguing that lack of technical expertise leads to counterproductive holdings); 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) (arguing that judges are influenced more by common sense than review of a voluminous administrative record); Shapiro, *supra* note 8, at 467; SHAPIRO, *supra* note 38, at 155.

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 had no experience with the difficulties encountered in administering a technically complex regulatory program, and they lacked any expertise in the scientific 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 experience and 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 when conducting hard look review do not have much relationship to the substantive effects of the regulation. 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 clever lawyers and other agency staffers can construct a satisfactory post hoc rationalization for whatever decision the agency has reached, this exercise consumes substantial agency resources. Therefore, the critics argue, judicially-imposed explanatory requirements make government action more expensive and therefore make it harder for agencies to carry out their assigned tasks.⁴³ It may seem odd at first to imagine that the requirement that an administrative agency supply a plausible explanation for its decision would entail more than trivial costs, at

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

41. *Id.* at 547.

42. *See id.* at 550-52.

43. *See* STEPHEN BREYER, *BREAKING THE VICIOUS CIRCLE: TOWARD EFFECTIVE RISK REGULATION* 58 (1993); JAMES Q. WILSON, *BUREAUCRACY: WHAT GOVERNMENT AGENCIES DO AND WHY THEY DO IT* 282 (1989); John S. Applegate, *Worst Things First: Risk, Information, and Regulatory Structure in Toxic Substances Control*, 9 *YALE J. ON REG.* 277, 286-87 (1992); 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). *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).

least if the agency had done its job properly. But many observers 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 arise because 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 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 rather than additional evidence, the burdens on the agency can be significant in light of the fact that:

[T]hese additional analytical requirements invite abuse by regulatees who hire 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 . . . [A]gencies 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 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.

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.

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

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

47. *See* 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.

The polar positions just described are something of a caricature. Most scholars involved in the hard look debate articulate more nuanced views of the effects of hard look review and 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 this debate can fall into one of two groups: those who think hard look review is helpful to courts and not too costly for agencies,⁵⁰ 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. Let us assume, for purposes of developing the 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 usually can 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 can be quite expensive for the agency. It is precisely this characteristic of hard look review that may make it more useful to reviewing courts than most hard look critics or proponents appreciate. Because the production 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

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. 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, at 527-29.

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 also have 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 hard look review confers. See, e.g., Strauss, *supra* at 1471.

explanations and justifications for agency regulations. The information content of these explanations, however, often may 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 regulation's net benefits. The second problem is a *divergent preferences* problem: OSHA and the court may disagree about 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 the regulation if it saves at least five lives

51. OSHA regulations are frequent targets of a version of hard look judicial review. *See, e.g.*, *Am. Textile Mfrs. Inst. v. Donovan*, 452 U.S. 490 (1981); *Indus. Union Dep't, AFL-CIO v. Am. Petroleum Inst.*, 448 U.S. 607 (1980); *Color Pigments Mfrs. Ass'n, Inc. v. OSHA*, 16 F.3d 1157 (11th Cir. 1994); *Am. Dental Ass'n v. Martin*, 984 F.2d 823 (7th Cir. 1993); *AFL-CIO v. OSHA*, 965 F.2d 962 (11th Cir. 1992); *Am. Iron & Steel Inst. v. OSHA*, 939 F.2d 975 (D.C. Cir. 1991); *Bldg. & Constr. Trades Dep't, AFL-CIO v. Brock*, 838 F.2d 1258 (D.C. Cir. 1988); *Pub. Citizen Health Research Group v. Tyson*, 796 F.2d 1479 (D.C. Cir. 1986); *Forging Indus. Ass'n v. Sec'y of Labor*, 773 F.2d 1436 (4th Cir. 1985); *ASARCO, Inc. v. OSHA*, 746 F.2d 483 (9th Cir. 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. *See* 5 U.S.C. § 551(13) (2000) (defining "agency action" as including "failure to act"); *id.* § 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 Am. 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). Additionally, 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'n, 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.*, *Pub. Citizen Health Research Group v. Chao*, 314 F.3d 143, 151-59 (3d Cir. 2002); *Pub. 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 and accompanying text.

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 doctrinal matter, it may be that the reviewing court is not supposed to evaluate an OSHA decision using this sort of cost-benefit framework.⁵⁴ Nonetheless, I assume for purposes of this example that judges have policy preferences that influence their assessment of whether an agency decision is adequately justified, and that those preferences can be described in cost-benefit terms.

Let us refer to the proposed regulation's impact on relevant outcome variables as the *payoff* of the regulation.⁵⁵ In the OSHA hypothetical, we might imagine that the payoff is the annual number of statistical lives the regulation will save.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 may be quite uncertain. Call this estimate the *expected payoff*.⁵⁸ The agency, unlike the court, has specialized expertise. For simplicity, assume that the agency's expertise allows it to learn the true payoff with certainty before deciding whether to regulate.⁵⁹ This assumption exaggerates the extent of agency expertise, but it simplifies the exposition of both the asymmetric information problem and how hard look review might mitigate that problem.⁶⁰

54. See *Am. Textile Mfrs. Inst.*, 452 U.S. at 507-22.

55. In the formal model presented in the Appendix, *infra*, the *payoff* is the b parameter.

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 cost-per-life ratio. 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 *infra* Appendix. 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 *infra* Appendix. 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 *infra* Part II.B. 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 the agency is informed, and the parameter p is the probability that the agency is informed (i.e., $\theta=1$ with probability p). The situation described in the text, in which the agency is always informed, corresponds to the special case where $p=1$. See *infra* Appendix.

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

To incorporate the divergent preferences problem, assume that both the court and the agency have a *rationality threshold*;⁶¹ each decisionmaker views regulation as rational only if the payoff exceeds that threshold. Another way to think about this is to imagine that a decisionmaker's utility from regulation is equal to the regulation's payoff minus the decisionmaker's rationality threshold. The preference divergence between the agency and the court is 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 regulation under consideration—then the court's best strategy will be to uphold the agency's decision to regulate. In this scenario, any regulation that is good enough for the agency would also be good enough for the court. In such cases, we therefore 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 some regulations that the agency would favor that the court, if fully informed, would consider irrational. In this situation, how does the court decide whether to uphold an agency regulation?

At the moment the court must decide whether to uphold the agency's regulation, the court has acquired two additional pieces of information. First, the simple fact that the agency has regulated indicates that the true 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 rejected if the court had to pass on the regulation in the first instance.

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 *infra* Appendix.

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 decisionmakers who interact on a regular basis and know something about one another's political, philosophical, and professional backgrounds. Our ability to describe regulatory decisionmakers 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).

The fact that an agency's decision to act can influence courts in this way suggests an instrumental account of judicial deference to agency expertise that is consistent with the assumption that judges are outcome-oriented.⁶³

Second, the court can use the quality of the agency's explanation to estimate the cost involved in providing this explanation. The court then can infer that the payoff of the 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 their policy choices, even though the reviewing courts are not competent to assess whether those explanations are substantively valid.

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

Before examining how judicial assessment of the quality of an agency's explanation can influence the court's decision, 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.

To see why, imagine a regulation with an expected payoff below the court's rationality threshold. The court would reject this regulation if the court had to rule on it in the first instance. But if the same regulation is enacted by an informed agency, the court can infer that the true payoff must be 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 true payoff, and this adjusted payoff estimate may exceed the court's rationality

63. To be clear, I do not mean to endorse the proposition that judges are concerned primarily about policy outcomes. 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 AM. 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, and if the agency succeeds in getting the regulation past the courts, then 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.

threshold even if the *ex ante* expected payoff did not. Therefore, the court may uphold a regulation enacted by an informed agency that the court otherwise would have viewed as irrational.

To illustrate using the OSHA example, suppose that a proposed regulation will save some number of lives between 0 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 6 lives. The expected payoff is below the court's rationality threshold, meaning that the court initially views the regulation as irrational. But if OSHA enacts the regulation, the court can rule out the possibility that the regulation will save fewer than 6 lives. This means that the true payoff must be between 6 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 otherwise would oppose—might be characterized as reluctance by the reviewing court to “substitute its judgment for that of the agency.”⁶⁶ However, this judicial “deference” does not arise because judges are reluctant to impose their substantive policy views. While judges may have an incentive to describe decisions to uphold agency regulations in terms of respect, restraint, and the like, the above analysis suggests that judicial deference to agency expertise also may 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 by cases like *Sierra Club* and *United Steelworkers*, in which the reviewing court upholds an agency's conclusion only after extensive

65. This is not to say that the court knows with certainty that the regulation is a good idea. It is possible, in this example, that the true payoff is 7 lives.

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

67. See *id.*; *Citizens to Preserve Overton Park, Inc. v. Volpe*, 401 U.S. 402, 416 (1971).

scrutiny of the rulemaking record, and by 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 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 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 judicial scrutiny of the administrative record is an elaborate charade in which courts find justifications for making the decisions they would have made anyway. This more cynical hypothesis also may hold true in some instances, though it is hard to believe that rational 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, when the reviewing court scrutinizes the evidence and analysis marshaled by an agency in support of a proposed rule, the court may be neither learning about the accuracy of the agency's conclusions, nor observing a substantively reliable indicator of reasoned decisionmaking. The court nonetheless may 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 cases. 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 that it would otherwise oppose.

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 assumptions that the judiciary is institutionally incapable of comprehending anything in the administrative record, and that the type of "reasoned decisionmaking" the courts can discern in agency

68. In the formal model, record quality is denoted s , and the cost to the agency of generating record quality is denoted x . See *infra* Appendix. It is worth noting that the analysis assumes that the agency's choice of s does not change the payoff b . While this is a reasonable assumption in most cases, there may be circumstances in which it 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 actually increases the quality of the regulation. In this case, the regulatory payoff might be positively correlated with record quality. Although 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.

explanations has no substantive link to the quality of the agency's actual decisionmaking process.

These assumptions 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 these strong assumptions is useful for two reasons. First, assuming away any substantive informational value of the agency's explanation allows analytic isolation of the role that an explanation's cost, as distinct from its content, plays in influencing judicial review of agency decisions. In demonstrating that an explanation's cost has independent informational content, it is helpful to assume that the explanation's substantive content is totally useless, even if this assumption is empirically incorrect. Second, many administrative law scholars, including several of the most influential figures in the field, have taken positions that are not that far from the extreme assumptions I make in this Article.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 relax this assumption in a later section of this Article.⁷⁰

The costly signaling hypothesis further assumes that, even if the type of evidence and analysis the courts demand in hard look review cases is neither verifiable by the court nor inherently indicative of high-quality agency decisionmaking, providing this type of record is costly to the agency. Furthermore, this costly effort must be observable by the court.

The assumption that a reviewing court can infer record costs from record quality 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. For example, the D.C. Circuit was able to 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 and that OSHA had explained this evidence "convincingly."⁷⁴ The court therefore felt confident in holding that OSHA had provided adequate support for its

69. See *supra* notes 38-47 and accompanying text.

70. See *infra* note 107 and accompanying text.

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

72. *Id.* at 1253.

73. *Id.* at 1248.

74. *Id.* at 1252.

conclusions,⁷⁵ even though the court acknowledged that many of the issues involved were “technically complex . . . combining esoteric medical principles with highly theoretical mathematical analyses.”⁷⁶

Although terms like “convincing” and “careful” do imply some assessment of the merits, the thrust of the *United Steelworkers* opinion 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, in *Sierra Club* the D.C. Circuit admitted the limits of its institutional competence to evaluate the substance of the record, and instead described its role 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 appear to have an easier time figuring out whether the agency provided a resource-intensive explanation than figuring out whether this explanation is defensible on its merits.

The court can use the agency’s investment in record quality to update its estimate of the payoff. A rational agency would not pursue a regulation that is not worth the cost of protecting from judicial reversal. The court therefore can infer, from the quality of the record, whether 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 0 and 20, with any number in that range being equally likely *ex ante*. Therefore, the expected payoff is 10. Assume further that 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.

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 from the quality of the record that, in preparing such a record, OSHA incurred costs with a utility equivalent (to OSHA) of saving 4 additional statistical lives per year.⁷⁸ The court can

75. *Id.* at 1263.

76. *Id.* at 1259.

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

78. The idea that an agency can treat regulatory concerns like the prevention of deaths on the same scale with the resource costs associated with record production 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. *See supra* note 43. Furthermore, this assumption is grounded in two reasonable considerations. First, an agency’s private interest in achieving regulatory goals may diverge from the public interest in achieving those goals. Indeed, this is likely to

infer from this that the true 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 for the court to uphold the regulation.

To summarize, 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. These cost estimates are useful to the court because they indicate how valuable the regulation is to the agency. This information is helpful to the court 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, but not otherwise, even if content of the record is not in itself particularly informative.

C. Behavioral Implications and Predictions

As a 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 or on the cynical assumption that scrutiny of a decisionmaking record is a meaningless charade. This perspective suggests a possible reconciliation of seemingly conflicting empirical 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 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 observation that uninformed judges 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

be the case given that agencies, even altruistic or politically responsive agencies, typically will not internalize the full benefits of efficient regulation, while the resource costs of providing high-quality regulation are concentrated in the agency. Second, because agency resources are finite, devoting more resources to defending any particular regulation means fewer resources are available for pursuing other activities that agency decisionmakers or their political overseers consider valuable.

persuasively that agency records often do not reflect actual decisionmaking processes and that courts are ill-equipped to evaluate the substantive content of these records. 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 decisionmaking process or by the claim that courts cannot understand them.

The signaling theory also offers an alternative perspective on the claim that aggressive hard look review leads to the "ossification" of agency rulemaking because of the 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 positive 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 of 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 *ex ante* of a given 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

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

80. One important complication, not pursued 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 LAW & CONTEMP. PROBS. 111 (1994).

81. Rodgers, *supra* note 39, at 302.

the court that the 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 that the court will require as a condition of upholding regulation will increase.⁸³ The need to provide a higher quality record will, in turn, deter the agency from regulating 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 undertakes.

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 were 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 to achieve 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 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 consideration is that some agencies may be 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 cost—for example, agencies with a large staff of highly skilled lawyers and other professionals, or agencies with lower opportunity

82. See *supra* Part I.B.1.

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

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* note 14, 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”).

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 to signal to the court that it invested substantial resources in preparing that record.⁸⁵ The agency is advantaged by improvements in record-generating capacity 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 mutually exclusive with other possible functions of hard look review. For instance, although 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, likely—that agency records may convey some 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 theory'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 proxy for the agency's record costs—are substantively implausible. The second objection is that the costly signaling account is inconsistent with how

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) (Easterbrook, J., dissenting)). Other judges reject that suggestion, see *Salameda*, 70 F.3d at 449, though similar considerations might still impact judges' assessments of agency explanations tacitly or subconsciously.

86. An additional implication 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 to survive judicial review.

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 account of 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 are vulnerable to substantive challenge.

Consider first the assumption that the expected benefit of a policy to the reviewing court is positively correlated with the benefit of that policy to the agency. This assumption is important because the costly signaling argument is built around the idea that the more the agency values a regulation, the more likely it is that the court, if fully informed, would be willing to uphold it. This condition does not require that the government and the court have identical preferences; the positive correlation assumption is valid as long as the government and the court share the same basic objectives (for example, 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. That type 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 relevant to a regulation's rationality.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

87. See 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).

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, 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 caused by factors the court views as irrelevant. Yet 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 lives saved and the political benefits from adopting the regulation that are independent of its life-saving effects. This latter benefit might arise because the regulation has some symbolic value or because regulatory burdens will fall disproportionately on the incumbent administration's political opponents.

In this example, assume that the number of lives the regulation will save is equally likely *ex ante* to be any number between 0 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 0 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 is between 10 and 40. The court's estimate of the expected payoff of the regulation to OSHA is therefore 25. Because OSHA cares equally about the number of lives saved and the unrelated political

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

benefits, 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 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—the expected number of lives saved—is 15. This is equal to the court's rationality threshold, so the court would uphold the regulation. Of course, the court does not know for certain that the regulation will actually save 15 lives. It is possible that OSHA learned that the regulation would save no lives but would confer a political benefit worth 20 lives to the agency. Nonetheless, the court's *expected* payoff is 15, so it would rationally uphold the regulation. 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 though the court knows that the agency is also motivated by concerns that the court views as irrelevant.

The 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 costs.⁸⁹ This ultimately is an empirical dispute, and its resolution is beyond the scope of the present Article.

The second point of vulnerability concerns the plausibility of the notion that judges can infer the cost incurred by the agency from the quality of the record. The 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 decisionmakers to produce impressive-looking records. That said, the

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

efficiency of record quality as a signal degrades as judges' ability to draw inferences about the costs associated with record quality worsens.

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 its estimate of the regulation's benefits upwards, 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 agency's record, then record quality cannot function as a useful signal. The necessary assumptions, however, are less demanding and more empirically plausible than they may appear initially.

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 also have sometimes indicated, at least indirectly, that they recognize that the production of records and other forms of explanation taxes agency resources.⁹¹ Courts do occasionally make explicit reference to the size or detail of the agency's record in a way that suggests these considerations influenced the court's views on whether the agency acted rationally. For example, in *Baltimore Gas & Electric Co. v. National Resources Defense Council, Inc.*, the Supreme Court observed,

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."); *Int'l Harvester Co. v. Ruckelshaus*, 478 F.2d 615, 650-51 (D.C. Cir. 1973) (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 whether

the government [has] 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 enough to warrant such calls upon public resources?

Judge Breyer's opinion implies that the answer in that case was no; the court believed the agency had acted irrationally. More generally, however, the language in *Ottati & Goss* 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 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.

in support of its decision upholding a Nuclear Regulatory 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 consideration 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.

92. 462 U.S. 87, 98-99 & n.11 (1983); *see also* *City of Shoreacres v. Waterworth*, 420 F.3d 440, 446 n.3 (5th Cir. 2005) (upholding the 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”); *Am. Dental Ass’n v. Martin*, 984 F.2d 823, 824 (7th Cir. 1993) (observing 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”); *Pub. 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 had “completed the difficult task of regulating occupational exposure to suspected carcinogens with a thorough and professional approach”); *Carstens v. NRC*, 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 Indus. 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 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 EPA’s decisions are “adequately explained and amply supported by evidence in the record”).

While the costly signaling hypothesis would doubtless be stronger if it found support in the accounts given by judges and administrators, the fact that these 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, they would have powerful reasons to be less than candid about this. Judges 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 decisionmaking process, even if that were the main function of these materials. Second, the theory does not require that judges and administrators subjectively and consciously think about record production and hard look review in signaling terms. Just as an illiterate street vendor intuitively understands the concept of marginal cost and a used car buyer intuitively understands adverse selection, judges may have an intuitive sense that impressive looking records demonstrate serious commitment, and judges also may 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. Similarly, 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 probably was 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.

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 hard look review that 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 argument's failure 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" 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 signaling 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 responses 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, because of 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. It is at least conceivable that in some contexts record quality is one of the better available alternatives.

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

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

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 of this type is less effective if it is more costly to some types of sender than to others. 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 (observing that even unfamiliar actions, such as literally burning money, can have a more transparent cost structure than other more familiar behaviors).

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 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 developed the system with that function in mind.⁹⁶ In that sense, the observation that judges and administrators do not consciously think about hard 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 help the reviewing court to distinguish between expert agencies and ignorant agencies, then expert agencies always would prefer to signal using record quality, and ignorant agencies would mimic this behavior to avoid giving themselves away.⁹⁷ So, the court may demand high-quality records, rather than some other form of costly signal, because high-quality records sometimes (even if rarely) turn out to provide the court with useful information, or to impose discipline on agencies. Even if that benefit is realized too rarely to provide a satisfactory explanation or defense of hard look review, it may explain why agency signaling through record quality might be a better option for the court than agency signaling through some completely worthless activity.

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

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).

97. See *infra* notes 106-07 and accompanying text.

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. In this Part, 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 that 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 becomes informed.⁹⁹

Incorporating the possibility that the agency might remain 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 about whether the agency is informed or not. This leads to additional hypotheses regarding how the behavior of the agency and court change as the agency's expertise changes. Second, uninformed agencies may regulate less efficiently or effectively than informed agencies, a possibility that also gives rise to additional results. 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.

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 is likely to know it. I am using "expertise" in the former sense. This reflects the fact that when we say, for example, that OSHA has specialized expertise in workplace safety, we usually mean that OSHA is more likely than other decisionmakers to analyze a workplace safety issue correctly, not that it already knows the answers to all questions on this topic.

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. In some cases, the simple fact that the agency regulated signals that it 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 its expected payoff (10) is below its rationality threshold (12). OSHA would regulate only if it both becomes informed and learns that the true payoff is 12 or more. The court therefore can 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 agency's decision to regulate actually 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 8, and OSHA's probability of learning the true payoff is 50%. If OSHA remains uninformed, it would nonetheless prefer to regulate because the expected payoff (10) is above OSHA's rationality threshold (8). If OSHA becomes informed, it prefers to regulate if, but only if, the payoff is 8 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 8 or more (a 30% probability *ex ante*). The court can, however, rule out the possibility that OSHA was informed and observed a payoff below 8 (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

The agency also can 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 8, and OSHA's *ex ante* probability of becoming informed is 50%. If OSHA regulates and spends nothing on

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%). $(0.6 \times 0.5) / ((0.6 \times 0.5) + (1 \times 0.5)) = 0.6 / 1.6 = 0.375$.

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 that the agency becomes informed—affect the record quality demanded by courts and supplied by agencies? 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. 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 hard look review.

If, however, the minimum spending on record quality necessary for an agency to survive judicial review is not enough to guarantee that only informed agencies regulate, then expertise indeed affects 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 0 and 20 (which means the expected payoff is 10), OSHA has a 50% chance of becoming informed, OSHA's rationality threshold is 6, 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 signal that OSHA is definitely 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 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

101. See *supra* note 100.

expected payoff of regulation if OSHA was informed (14).¹⁰² The court therefore can 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. The agency therefore has less need 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, 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 indeed would be the case if the quality of the record were 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, however, greater agency expertise will translate into lower-quality records, all else equal.

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, but 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 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

102. Because OSHA's rationality threshold is 6 and the utility cost of the record is 2, the fact that OSHA regulated means that, if OSHA is informed, the true payoff must be between 8 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 *infra* Appendix.

also increase the payoff.

One way to integrate this possibility into the earlier analysis is to characterize the difference in the quality of regulation by an informed agency and regulation by an 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

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 agency is informed, then decreasing the expected payoff of uninformed regulation (i.e., increasing the ignorance penalty) will increase record quality. The reason is that, 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 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

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 *infra* Appendix.

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 also is possible that informed agencies have an easier time producing impressive records than uninformed agencies do. This possibility suggests one way to relax the assumption, 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. Uninformed agencies, however, might still be able to "fake it"—provide 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 also may be the case 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 an uninformed agency would still regulate, increases in the ignorance tax have no direct effect on record quality. Such increases do, however, make it less

106. See *infra* note 107 and accompanying text.

107. In the formal model, the ignorance tax is parameter t . See *infra* Appendix. 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.

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 would 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 record quality. When signaling to the court that the agency is informed is either unnecessary or insufficient for the court to uphold a regulation, the fact that it is more costly for uninformed agencies to produce high-quality records 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 a similar dynamic may be at work in a variety of other public law contexts in which the primary government decisionmaker is, or may be, better informed than the reviewing 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 public law applications, at opposite ends of the judicial hierarchy: Supreme Court review of congressional findings in constitutional litigation and magistrate review of police search warrant applications.

A. Constitutional Law: State Interest and Congressional Jurisdiction

In certain areas of constitutional law, the Supreme Court has suggested

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

that the constitutionality of legislative action may depend in part on the quality of the legislative record. Although 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 when reviewing the constitutionality of legislation, there are at least two contexts where the Supreme Court appears to have hinted at something like this approach.

First, there are a handful of opinions, particularly in First Amendment cases, in which the Court has looked to the legislative record to determine whether the government had demonstrated a sufficiently strong interest in the challenged legislation.

Second, the Court has evaluated the quality of the legislative record in several cases raising the question of whether congressional legislation is authorized by Section Five of the Fourteenth Amendment.

In both contexts, observers have characterized the Court's inquiry into the quality of the legislative record either as an illegitimate excuse for outcome-oriented decisionmaking 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, better informed about factual questions that it deems relevant to a given statute's desirability and that the Supreme Court considers relevant to the statute's constitutionality. Congress, however, cannot communicate this information verifiably to the Court. Suppose further that the preferences of the Court and Congress are positively correlated in expectation—legislation that Congress prefers more strongly is, on average, more likely to be compatible with the Court's constitutional views—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 constitutionally relevant, and evaluating this interest entails a factual determination about the legislation's likely impact.

Consider, for example, the Supreme Court's successive decisions in

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

litigation over the “must-carry” provisions of the 1992 Cable Television Consumer Protection and Competition Act (CTCPA), 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

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

110. 512 U.S. 622 (1994).

111. *Id.* at 661-63.

112. *Id.* at 665-66 (citing *Walters v. Nat’l Ass’n of Radiation Survivors*, 473 U.S. 305, 331 n.12 (1985)).

113. *Id.* at 666.

114. *Id.* at 664-68. Justice Blackmun concurred, but emphasized that deference ordinarily is caused by 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., 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, 676 (O’Connor, J., concurring in part and dissenting in part); *id.* at 685 (Ginsburg, J., concurring in part and dissenting in part).

When the issue reached the Court again in *Turner Broadcasting System, Inc. v. FCC (Turner II)*,¹¹⁵ however, the Court upheld the CTCPCA. 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 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 The Court appears to have used 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

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 225-27 (Breyer, J., concurring in part).

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

118. *Id.* at 213.

119. See, e.g., 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, 332-39 (2001).

120. See *id.* at 338-39.

121. See *United States v. Playboy Entm't Group, Inc.*, 529 U.S. 803, 806-07, 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 near barren legislative record," and remarking that although "a 10,000-page record [need not] be compiled in every case . . . the Government must present more than anecdote and supposition"); *Nixon v. Shrink Mo. Gov't 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 (2000) (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*, 545 U.S. 469 (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, *id.* at 483-90, and Justice Kennedy's concurrence stressed this point as well. *Id.* at 494 (Kennedy, J., concurring) ("The city complied with elaborate procedural requirements that facilitate review of the record and inquiry into the

conventional 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 a preferred policy result.¹²⁴

The costly signaling theory provides an alternative 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 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.

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.

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 *Boerne v. Flores*,¹²⁷ which struck down the Religious Freedom Restoration Act,¹²⁸ 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 religion,¹²⁹ but the Court insisted that the "lack of support in the legislative record" was not dispositive and that judicial deference to Congress generally is not "based on the state of the legislative record Congress compiles"¹³⁰

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 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.¹³¹ The Court

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).

128. Religious Freedom Restoration Act of 1993, Pub. L. No. 103-141, 107 Stat. 1488 (1993) (presently codified at 42 U.S.C. §§ 2000bb-2000bb-4 (2000)).

129. *Boerne*, 521 U.S. at 530-31.

130. *Id.* at 531.

131. For example, in *Florida Prepaid Postsecondary Educ. Expense Bd. v. Coll. Sav. 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," it emphasized that "identifying the targeted constitutional wrong or evil is still a critical part of [the] § 5 calculus," 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.* at 646. 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 Bd. 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 *Bd. of Trustees of the Univ. 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

also has relied heavily on the quality of the legislative record in post-*Boerne* decisions upholding congressional statutes abrogating state sovereign immunity pursuant to Section Five.¹³²

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*¹³³ and *United States v. Morrison*,¹³⁴ which emphasized that,

[w]hile 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.¹³⁵

It also is 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 theory suggests another possibility. It may be that both the

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 (citing 42 U.S.C. § 12101 (2000)).

132. For example, *Nevada Dep't of Human Res. 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 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. *See 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.

133. 514 U.S. 549 (1995).

134. 529 U.S. 598 (2000).

135. *Id.* 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 regulated activity has a substantial effect on interstate commerce. *Id.* at 1363-66. The Supreme Court's decisions in both *Lopez* and *Morrison* appear to reject that notion, however.

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 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 regarding how serious Congress perceives the issue to be.¹³⁶

B. Criminal Procedure: The Warrant Requirement

Although 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 magistrates almost always approve warrant applications,¹³⁷ and that searches pursuant to warrants have a very high success rate.¹³⁸ 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 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.¹³⁹

The high approval rate for warrant applications may also be explained, at

136. 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.

137. 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).

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

139. *Id.* at 926 & n.19. Other scholars have discussed this argument with varying degrees of sympathy. See, e.g., David A. Sklansky, *Quasi-Affirmative Rights in Constitutional Criminal Procedure*, 88 VA. L. REV. 1229, 1246 n.50 (2002) (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"); 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). Both Professor Stuntz and Professor Sklansky seem to accept Professor 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. Professor Stuntz's objections concern whether this screening could be achieved in some other, more socially desirable way, *cf. supra* Part I.D.3, and Professor Sklansky's objections concern whether the cost of obtaining a warrant has been set at a socially optimal level. See Sklansky, *supra* at 1246 n.50.

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 also may 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 does the officer. 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 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 telephone¹⁴⁰—then, all else equal, a magistrate's propensity to grant a police officer's warrant application also 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 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. The costly signaling theory therefore may 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.¹⁴¹

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 decisionmaker whose decision is under review, judges may be limited in

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

141. 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.

their ability to evaluate the information contained in such an explanation.

There may, however, be 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 also may learn valuable information from the resources an expert government decisionmaker 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 signaling function of hard look review 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.¹⁴²

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

142. 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, *supra* note 32, at 577-78; see also Cross, *supra* note 38, at 1015-22 (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.

Another aspect of the normative assessment of hard look review concerns the social costs associated with the resources the government expends preparing a record. It may be that these costs, though significant to the government, are socially unimportant. Perhaps, for example, the resources the government devotes 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 regulatory activities, or if the increased costs of regulation lead to higher levels of taxation, then the social inefficiency associated with reliance on record quality as a costly signal may be substantial.

In this 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 behavioral patterns associated with hard look review. If the theory does capture some important aspect of hard look review, then this may well have important implications for related normative debates. But resolving these debates and 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 and the resolution of contested value questions about which this Article offers no special insight.

While this Article has focused on judicial review of government decisions, the costly signaling dynamic may have applications to judicial review in other contexts. 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 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 that differ from the conventional understandings and defenses of those doctrines and practices. This observation suggests a broader line of research into indirect mechanisms of communication between legislatures, agencies, courts, and other public or private parties.

APPENDIX

I. MODEL ASSUMPTIONS

Assume there is a decisionmaker A (for example, an agency) that can be one of two types, $\theta \in \{0,1\}$. 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 $z_A \in \{0,1\}$ —i.e., to maintain the status quo ($z_A = 0$) or to regulate ($z_A = 1$). If the agency regulates, it chooses to spend some amount $x \geq 0$ on record quality, which generates a public signal (i.e., an observed level of record quality), $s = x/(1+(1-\theta)t)$. Parameter $t \geq 0$, which is common knowledge, captures the “ignorance tax”—the degree to which uninformed agencies have higher marginal costs of producing record quality than do informed agencies.

If the agency regulates, a reviewer C (for example, a court) must choose action $z_C \in \{0,1\}$ —i.e., to strike down the regulation ($z_C = 0$) or to uphold it ($z_C = 1$). The court knows p but does not observe θ .

The final policy outcome 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 the agency is informed, it observes b before choosing whether to regulate. Neither an uninformed agency nor the court can observe b , though both know 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.

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, ε is a random variable drawn from a distribution with mean 0. This variable captures the possibility that the amount of preference divergence between the court and the agency may have a random component. For example, a regulation may confer a benefit on the agency that does not accrue to the court (negative ε) because this 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 $E(U_C | z=1) = E(U_C | z=0) = 0$, then the court chooses $z_C = 1$.

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

- *Step 1:* Nature chooses θ and b .
- *Step 2:* A observes θ . If, but only if, $\theta = 1$, A observes b .
- *Step 3:* A chooses z_A . If $z_A = 0$ the game proceeds immediately to Step 7.
- *Step 4:* A chooses $x \geq 0$.
- *Step 5:* C observes s .
- *Step 6:* C chooses z_C .
- *Step 7:* A and C receive their final utilities U_A and U_C .

II. 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.

The first refinement is the assumption 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.

The second refinement is 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 the 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 expected utility from upholding regulation is non-negative, and the court upholds the regulation if, and only if, doing so will give the court non-negative expected 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.

III. ANALYSIS

The LCS-PBE will be one of three possible types.

In the first type of equilibrium, the agency regulates even when it is uninformed. To characterize this equilibrium, first define s_1^* as the minimum s necessary for the court to uphold the regulation in the case where, by assumption, an uninformed agency would regulate. Next, define μ as the expected benefit to the agency of uninformed regulation. That is, $\mu \equiv E(b - k(b))$. The condition that an uninformed agency would regulate holds only if the signaling cost for an uninformed agency, $s_1^*(1+t)$, is less than μ . Therefore, the equilibrium signal sent by a regulating agency, denoted s^* , will be s_1^* if, but only if, $s_1^* < \mu/(1+t)$.

If this condition does not hold, then the LCS-PBE will be one of two other possible types. Define s_2^* as the minimum s necessary for the court to uphold the regulation if an uninformed agency would *not* regulate. This condition is satisfied if, but only if, the equilibrium signal $s^* \geq \mu/(1+t)$.

In the case where an agency must demonstrate that it is informed for the court to uphold the regulation (i.e., $s_1^* \geq \mu/(1+t)$), but a signal minimally sufficient to establish that the agency is informed is enough for the court to uphold the regulation (i.e., $s_2^* \leq \mu/(1+t)$), then the equilibrium signal sent by a regulating agency will be $s^* = \mu/(1+t)$. A signal of this quality just suffices to demonstrate to the court that the agency is informed.

If, on the other hand, a signal equal to $\mu/(1+t)$ is insufficient for the court to uphold regulation (i.e., $s_2^* > \mu/(1+t)$), 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:

Define s_1^* as the minimum s that solves:

$$\frac{p(1 - F(s))E(b | b > s) + (1 - p)\mu}{1 - pF(s)} \geq j$$

Define s_2^* is the minimum s that solves $E(b | b > s) = j$.

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

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

Proof:

- (a) The strategy profiles described in Proposition 1(a) comprise the LCS-PBE given the specified conditions:
- First, consider whether *C* has an incentive to deviate from its equilibrium strategy. Define q as *C*'s posterior belief about the probability that $\theta = 1$ given that *A* chose $z_A = 1$. 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 $\Pr(z_A=1 | \theta=0) = 1$. By substituting these values into the above equation for q , we can rewrite this equation as:

$$q = \frac{p(1 - F(x))}{1 - pF(x)}.$$

- *C*'s expected utility from upholding the regulation, given its beliefs, can be expressed as $E(U_C | z=1) = qE(b | \theta=1, z_A=1) + (1-q)\mu - j$. Substituting for q gives:

$$E(U_C | z = 1) = \frac{p(1 - F(s_1^*))E(b | b > s_1^*) + (1 - p)\mu}{1 - pF(s_1^*)} - j.$$

- 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.
- Next, consider whether A has an 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 $\theta = 0$, A were to select a higher x , $(1+t)s_1^* + e$, A 's expected utility would be $\mu - (1+t)s_1^* - e < \mu - (1+t)s_1^*$. If A were to select a lower x , $(1+t)s_1^* - e$, the signal sent would be $s = s_1^* - (e/(1+t)) < s_1^*$, so C would select $z_C = 0$ and A 's utility would be $-(1+t)s_1^* + e < 0$. 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 $b \leq s_1^*$.
- 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:

- Again, we consider first whether C has an incentive to deviate from its equilibrium strategy. Given A 's equilibrium strategy, C is certain that, if A regulated, A must have been informed. That is, $\Pr(\theta=1 | z_A=1) = 1$.
- 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.
- Next, we consider whether A has an 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 therefore will 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 , $s_2^* - e$, then in equilibrium C will choose $z_C = 0$, giving A utility $-s_2^* + e \leq b - s_2^*$. If A chooses a higher s , $s_2^* + e$, C will choose $z_C = 1$ and A 's payoff will be $b - s_2^* - e < b - s_2^*$. Therefore, A has no incentive to deviate from its equilibrium strategy when $\theta = 1$ and $b > s_2^*$.
- The condition that $s_1^* > \mu/(1+t)$ means there is no PBE in which C will choose $z_C = 1$ if its posterior belief is that the probability that $\theta=1$ is less than 1. Therefore, for a PBE to exist when $s_1^* > \mu/(1+t)$, two requirements must be satisfied. First, C must believe that $\Pr(\theta=1 | z_A = 1) = 1$. The minimum s satisfying this requirement is $\max\{0, \mu/(1+t)\}$, because this s value implies an x sufficiently large to eliminate any positive expected value an uninformed A might otherwise obtain from outcome $z=1$. Second, it must be the case that C 's expected value of b given that A regulated ($E(b | z_A=1)$) is greater than j . The minimum s that satisfies this condition is, by definition, s_2^* . Because both of these conditions must be satisfied for the candidate PBE to exist, only one of them will bind (except where $s_2^* = \max\{0, \mu/(1+t)\}$), and the binding condition determines which PBE is the LCS-PBE. When $s_2^* > \mu/(1+t)$, 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:

- As in the previous cases, we start by checking whether C has an incentive to deviate from its equilibrium strategy. Because of A 's equilibrium strategy, C can infer that, if $z_A = 1$ and $s \geq \mu/(1+t)$, then $\theta = 1$ and $b > \mu/(1+t)$.
- Therefore, C 's expected payoff from choosing $z_C = 1$ is $E(b \mid b > \mu/(1+t)) - j$. Given (a) that $E(b \mid b > s_2^*) \geq j$ by definition; (b) the condition that $\mu/(1+t) > s_2^*$; and (c) the fact that $d/ds[E(b \mid b > s)] \geq 0$, it follows that $E(b \mid b > \mu/(1+t)) > j$. Therefore, C has no incentive to deviate from its equilibrium strategy if $s \geq \mu/(1+t)$.
- If $\theta = 0$, then if A chooses $z_A = 1$ and any $x < \mu$, C will observe $s < \mu/(1+t)$ and will select $z_C = 0$. A 's expected payoff therefore will be $-x \leq 0$. If A chooses $z_A = 1$ and any $x \geq \mu$, C will observe $s \geq \mu/(1+t)$ 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 $b \leq \mu/(1+t)$, A 's utility from choosing $z_A = 1$ is $-x \leq 0$ if $x < \mu/(1+t)$ and is $b - x \leq 0$ if $x > \mu/(1+t)$. Therefore, A has no incentive to deviate from its equilibrium strategy when $\theta = 1$ and $b \leq \mu/(1+t)$.
- If $\theta = 1$ and $b > \mu/(1+t)$, A 's payoff from its equilibrium strategy, $z_A = 1$ and $s = \mu/(1+t)$, is $b - \mu/(1+t) > 0$. If A were to choose a higher s , C still will 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 $b > \mu/(1+t)$.
- 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 $s = \mu/(1+t)$. Because of the condition that $s_2^* < \mu/(1+t)$, $s = \mu/(1+t)$ 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.

IV. COMPARATIVE STATICS

Recall that $s^* \in \{s_1^*, s_2^*, \mu/(1+t)\}$ is the signal that A 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 $s_1^* = s^* > j$. It follows immediately from this that $E(b | b > s^*) > j$. The fact that $s^* = s_1^* > 0$ implies that $s_1^* = s^* < \mu/(1+t) \Rightarrow s^* < \mu$. This, coupled with the assumption that $s^* > j$, implies that $\mu > j$. The fact that $s^* = s_1^* > 0$ implies that:

$$p(1-F(s^*))E(b | b > s^*) + (1-p)\mu = j(1-pF(s^*)).$$

This can be rewritten as:

$$P(1-F(s^*))(E(b | b > s^*) - j) = (1-p)(j - \mu).$$

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 $s_1^* \geq 0$, it follows that:

$$\frac{\partial s_1^*}{\partial j} = \frac{1 - pF(s_1^*)}{pf(s_1^*)(j - s_1^*)} \geq 0.$$

- 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 $\mu/(1+t)$.

- Second, again using the implicit function theorem and the fact that $E(b | b > s_2^*) = j \Rightarrow s_2^* \leq j$, we know that:

$$\frac{\partial s_2^*}{\partial j} = \frac{1 - F(s_2^*)}{f(s_2^*)(j - s_2^*)} \geq 0.$$

- This implies that 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 $\mu/(1+t)$.
- If $s^* = \mu/(1+t)$, changes in j clearly have no direct effect on s^* . In this range, a change in j affect s^* only if this change is sufficient to switch the equilibrium from $s^* = \mu/(1+t)$ to $s^* = s_1^*$ or $s^* = s_2^*$.

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:

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

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 $s^* = \max \{s_2^*, \mu/(1+t)\}$, then p is uncorrelated with s^* .

Remark 3: Increases in t decrease $\mu/(1+t)$, the threshold signal value above which C can infer $\Pr(\theta=1 | z_A=1) = 1$. 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 $s^* = \mu/(1+t)$. The t parameter therefore is either negatively correlated or uncorrelated with s^* . As long as $\mu/(1+t) > s_2^*$ (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 $\mu/(1+t) \leq s_2^*$, 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 $\mu/(1+t)$. If $s_1^* > \mu/(1+t)$, increases in μ increase s^* if $\mu/(1+t) > s_2^*$, which also increases the range of parameter values for which $\mu/(1+t) > s_2^*$. 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 $s_1^* > \mu/(1+t) > s_2^*$, then further increases in μ will increase $s^* = \mu/(1+t)$. But as soon as μ increases to the point where $\mu/(1+t) > s_1^*$, 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.)

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