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TOWARD A CAUTIOUS APPROACH TO OBEISANCE: THE ROLE OF SCHOLARSHIP IN FEDERAL CIRCUIT PATENT LAW JURISPRUDENCE

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I. INTRODUCTION

This symposium is devoted to patent law reform, and every time I think about reform I am reminded of the famous quip, "don't talk to me of reform, things are bad enough as they are."[1] Given that contingencies are plentiful, I proceed with these words in mind and write this article with the modest goal of getting the reader to question whether the federal courts, particularly the Federal Circuit, should be more receptive to empirical and social science scholarship when deciding patent cases.[2]

My principal point is that patent law is not without context. Our patent laws operate as part of an interdependent mix of incentives and regulations that bestow benefits and impose costs on society and individuals alike. And the patent system is relied upon to varying degrees and for different reasons by divergent industries.[3] The Federal Circuit's opinions embody sophisticated reasoning and thoughtfulness, and the judges certainly understand the contextual nature of patent law (and other areas of the law for that matter). But given the special status of the Federal Circuit and its expansive judicial power,[4] I wonder whether this understanding is adequately reflected in its opinions;[5] or expressed in a sufficiently candid manner.[6] Indeed,

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[1] This quote may be apocryphal, but has been attributed to a number of scholars including Edmund Burke. *See, e.g.,* Frank H. Easterbrook*, Cyberspace Versus Property Law?*, 4 TEX. REV. L. & POL. 103, 104 (1999).)))

2. The same can be asked of Congress, but that inquiry is for another time.

3. *See* WESLEY M. COHEN, RICHARD R. NELSON & JOHN P. WALSH, PROTECTING THEIR INTELLECTUAL ASSETS: APPROPRIABILITY CONDITIONS AND WHY U.S. MANUFACTURING FIRMS PATENT (OR NOT) 4 (Nat'l Bureau of Econ. Research, Working Paper No. 7552, 2000) (finding that firms in certain industries patent to block the development of substitutes by a rival while firms in other industries are more likely to use patents to force rivals into negotiations).

4. For example, on the issue of claim construction, see Cybor Corp. v. FAS Techs., Inc., 138 F.3d 1448, 1456 (Fed. Cir. 1998) (reaffirming that claim construction is a "purely legal question" reviewed "de novo on appeal including any allegedly fact-based questions relating to claim construction"). On the issue of Patent and Trademark Office (PTO) obviousness determinations, see *In re* Rouffet, 149 F.3d 1350, 1355 (Fed. Cir. 1998) ("This court reviews the ultimate determination of obviousness as a question of law."). The underlying factual considerations of an obviousness determination are reviewed under the substantial evidence standard. *See* Rapoport v. Dement, 254 F.3d 1053, 1058 (Fed. Cir. 2001) (noting that the PTO's "factual determinations underlying its rulings on anticipation and obviousness are reviewed under the substantial evidence test" (citing Dickinson v. Zurko, 527 U.S. 150 (1999))).

5. That is, adequately reflected from an empirical or social science perspective.

6. The candor issue pertains to the court's technologic particularization. Specifically, as I discuss in Part IV, *infra*, scholars have pointed out that the court has, in recent years, begun to treat technologies differently under its common law and Title 35 of the United States Code. My point is that although particularization may be desirable, the

an appellate court that limits the power of those institutions positioned closer to the ground should utilize a vehicle that allows the court to compensate for its institutional disadvantages vis-à-vis district courts[7] and the United States Patent and Trademark Office.[8] In other words, a window on the world is needed.

Over the past fifteen years, but particularly in the last five, there has been a significant amount of empirical and social science scholarship in the area of patent law.[9] Much of the

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court has neither discussed its rationale for particularization, nor cited any empirical or social science research to justify such.

7. *See, e.g.*, Maurice Rosenberg, *Judicial Discretion of the Trial Court, Viewed From Above*, 22 SYRACUSE L. REV. 635, 663 (1971) (writing that it is not that the trial court judge "knows more than his loftier brothers; rather, he sees more and senses more"). Professor Rosenberg goes on to write:

> In the dialogue between the appellate judges and the trial judge, the former often seem to be saying: "You were there. We do not think we would have done what you did, but we were not present and we may be unaware of significant matters, for the record does not adequately convey to us all that went on at the trial. Therefore, we defer to you.

Id.

8. *See* Craig Allen Nard, *Deference, Defiance, and the Useful Arts*, 56 OHIO ST. L.J. 1415, 1499-1507 (1995) (describing institutional and constitutional advantages of PTO in determining patentability). For a discussion on the relative advantages and disadvantages between courts and agencies regarding the allocation of interpretive authority, see 1 KENNETH CULP DAVIS & RICHARD J. PIERCE, JR., ADMINISTRATIVE LAW TREATISE 90-91 (3d ed. 1994).

9. Indeed, at least two Federal Circuit judges have publicly recognized an increase in empirical and social science scholarly output. *See* Festo Corp. v. Shoketsu Kinzoku Kogyo Kabushiki Co., 234 F.3d 558, 639 (Fed. Cir. 2000), *vacated by* 122 S. Ct. 1831 (2002) (Newman, J., concurring in part, dissenting in part) ("There is burgeoning modern scholarship directed to studies of invention, investment, and patent systems, generally building on the work of William D. Nordhaus."); *see also* Hon. Paul Michel, speech delivered at Patent Law Reform Conference on March 1, 2002 in Berkeley, California (recognizing recent trend in empirical and economic patent law scholarship).

This trend toward the empirical and social science could arguably be considered a counter-trend when viewed in the context of legal scholarship generally. Several commentators have bemoaned the excessive production of multidisciplinary and high-theory legal scholarship. As Richard Posner wrote, "[s]ome crazy stuff is being published in law reviews nowadays." RICHARD A. POSNER, OVERCOMING LAW 101 (1995) [hereinafter POSNER, OVERCOMING LAW]. *See also* Richard A. Posner, *Against Constitutional Theory*, 73 N.Y.U. L. REV. 1, 12 (1998) ("I would like to see the legal professoriat redirect its research and teaching efforts toward fuller participation in the enterprise of social science, and by doing this make social science a better aid to judges' understanding of the social problems that get thrust at them in the form of constitutional issues."); Harry T. Edwards, *The Growing Disjunction Between Legal Education and the Legal Profession*, 91 MICH. L. REV. 34, 35 (1992) ("[I]t is my impression that judges, administrators, legislators, and practitioners have little use for much of the scholarship that is now produced by members of the academy."). It would appear that Judges Posner and Edwards would agree with Professor David Shapiro when he writes, "scholarly criticism is not undertaken simply for the delectation of other scholars; it is designed to improve the world that is the subject of its concern." David L. Shapiro, *In Defense of Judicial Candor*, 100 HARV. L. REV. 731, 731 (1987). Some commentators have noted,

scholarship that forms the empirical[10] current has examined the relationship between patent law and innovation practices of firms in various industries, including research and development decision-making and the extent to which divergent industries rely on the patent system or other appropriability mechanisms;[11] the role of juries in patent cases;[12] Federal Circuit voting

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however, that while it remains a clear minority of scholarship being produced, more empirical legal work is being conducted. *See e.g.*, Michael Heise, *The Past, Present, and Future of Empirical Legal Scholarship: Judicial Decisionmaking and the New Empiricism*, 2002 ILL. L. REV. 101, 106 (2002) [hereinafter Heise, *Past, Present, and Future*] (noting that "[w]hile empirical legal scholarship remains the overwhelming exception to a general rule favoring non-empirical research, evidence suggests that the production of empirical legal scholarship is on the rise"); Linda C. McClain, *Toward a Formative Project of Securing Freedom and Equality*, 85 CORNELL L. REV. 1221, 1222 (2000) (describing the recent "trend" in legal scholarship as taking an "empirical turn").

For a discussion as to why law professors do not produce more empirical scholarship, see generally Michael Heise, *The Importance of Being Empirical*, 26 PEPP. L. REV. 807 (1999) [hereinafter Heise, *Importance*] (propounding that hard work, lack of training, exposure to falsification, lack of prestige, and lack of internal and external institutional incentives are among the reasons for the dearth of empirical legal scholarship); Peter H. Schuck, *Why Don't Law Professors Do More Empirical Research?*, 39 J. LEGAL EDUC. 323 (1989) (concluding through admittedly "casual" and "unsystematic methodology" that the amount of empirical or statistical legal research is quantitatively trivial because of the incentive structures and professional norms of law schools including disincentives such as inconvenience, lack of control, tedium, uncertainty, ideology, resources, time, tenure, and training).

10. By empirical scholarship, I mean quantitative or statistical research and analyses that are based on observation. *See* Heise, *Importance*, *supra* note 10, at 810; Schuck, *supra* note 10, at 323. *But see* Lee Epstein & Gary King, *The Rules of Inference*, 69 U. CHI. L. REV. 1, 2 (2002) (asserting that empirical scholarship is "far broader" than statistical analysis and "can be numerical (quantitative) or nonnumerical (qualitative)").

11. *See e.g.*, COHEN et al., *supra* note 4; Richard C. Levin et al., *Appropriating the Returns from Industrial Research and Development*, 3 BROOKINGS PAPERS ON ECON. ACTIVITY 783, 793-95 (1987) (analyzing 650 responses to a questionnaire using a seven-point scale to rate the effectiveness of alternative means of protecting new or improved products or processes); Edwin Mansfield, *Unauthorized Use of Intellectual Property: Effects on Investment, Technology Transfer, and Innovation*, *in* GLOBAL DIMENSIONS OF INTELLECTUAL PROPERTY RIGHTS IN SCIENCE AND TECHNOLOGY 107 (Mitchel B. Wallerstein et al. eds., 1993) (surveying 100 American firms about the importance of intellectual property rights protection in relation to direct foreign investment to test the hypotheses that weak protection in a developing country reduces the likelihood of investment there and encourages investment in wholly-owned subsidiaries and the transfer of older technologies); Edwin Mansfield, *Patents and Innovation: An Empirical Study*, 32 MGMT. SCI. 173 [hereinafter Mansfield, *Patents and Innovation*] (surveying manufacturing firms to evaluate the extent that patent protection affects the development and commercialization of new inventions); Edwin Mansfield, Mark Schwartz & Samuel Wagner, *Imitation Costs and Patents: An Empirical Study*, 91 ECON. J. 907, 915 (1981) (reporting survey results that analyzed the proportion of innovations that would be delayed or not introduced at all due to a lack of patent protection).

12. *See, e.g.*, Philippe Signore, *On the Role of Juries in Patent Litigation* (Part 1), 83 J. PAT. & TRADEMARK OFF. SOC'Y 791, 819-26 (2001) (illustrating the role of juries in patent litigation by comparing the proportion of verdicts by juries and judges holding for patentees); Philippe Signore, *On the Role of Juries in Patent Litigation* (Part 2), 83 J. PAT. & TRADEMARK OFF. SOC'Y 896, 914-15 (2001) (concluding that fear or criticism of the jury

patterns;[13] and patent litigation trends.[14] A good deal of the social science work is law and economics oriented,[15] focusing on the important normative issues of proprietary claim scope and patentability standards in the context of innovation policy.[16]

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system for patent trials is unfounded or exaggerated because of control mechanisms limiting the role of juries in patent cases); Kimberly A. Moore, *Judges, Juries, and Patent Cases—An Empirical Peek Inside the Black Box*, 99 MICH. L. REV. 365 (2000) (illustrating patent holders success rates in jury and bench trials).

13. *See, e.g.*, John R. Allison & Mark A. Lemley, *How Federal Circuit Judges Vote in Patent Validity Cases*, 27 FLA. ST. U. L. REV. 745 (2000) (chronicling patent validity decisions).

14. *See, e.g.*, Kimberly A. Moore, *Forum Shopping in Patent Cases: Does Geographic Choice Affect Innovation?*, 79 N.C. L. REV. 889 (2001) (substantiating procedural and substantive differences in district court adjudication); Josh Lerner, *Patenting in the Shadow of Competitors*, 38 J.L. & ECON. 463 (1995) (analyzing patenting patterns of firms with differing litigation costs).

15. Other forms of social science research may also prove relevant to patent law. For instance, studies on the psychology of inventing or political science literature focusing on the legislative process of judicial decisionmaking. As Justice Frankfurter, in *Sweezy v. New Hampshire*, 354 U.S. 234, 261 (1957) (Frankfurter, J., concurring), wrote of the breadth and power of social science: "The problems that are the respective preoccupations of anthropology, economics, law, psychology, sociology and related areas of scholarship are merely departmentalized dealing, by way of manageable division of analysis, with interpenetrating aspects of holistic perplexities."

16. *See, e.g.*, Suzanne Scotchmer, *Protecting Early Innovators: Should Second-Generation Products Be Patentable?*, 27 RAND J. ECON. 322 (1996) (arguing that patents on second-generation products are not necessary to encourage their development); Zvi Griliches, *The Search for R&D Spillovers*, 94 SCANDINAVIAN J. ECON. S29 (1992) (concluding that research and development spillovers are a prevalent and important part of economic growth); Mark F. Grady & Jay I. Alexander, *Patent Law and Rent Dissipation*, 78 VA. L. REV. 305 (1992) (theorizing that courts adopt rules of decision in patent cases to minimize dissipation of rent); Robert P. Merges, *Uncertainty and the Standard of Patentability*, 7 HIGH TECH. L.J. 1 (1992) (attempting to provide a basic economic model to evaluate the consequences of patent rules); Robert P. Merges & Richard R. Nelson, *On the Complex Economics of Patent Scope*, 90 COLUM. L. REV. 839 (1990) (concluding that law should favor a competitive environment for improvements rather than one dominated by the pioneer firm); Paul Klemperer, *How Broad Should the Scope of Patent Protection Be?*, 21 RAND J. ECON. 113 (1990) (illustrating the conditions that make patents with certain scopes most socially efficient and optimal); Robert P. Merges, *Commercial Success and Patent Standards: Economic Perspectives on Innovation*, 76 CAL. L. REV. 803 (1988) (arguing that the Federal Circuit's patent decisions that considered secondary factors, such as market success, yielded inefficient and costly results); Edmund W. Kitch, *The Nature and Function of the Patent System*, 20 J.L. & ECON. 265 (1977) (analogizing patents with mineral claims in the American West to conclude that the patent system increases the output from resources used for technological innovation while rewarding the inventor); Ted O'Donoghue, *A Patentability Requirement for Sequential Innovation*, 29 RAND J. ECON. 654 (1998) (proposing a minimum innovation size for patents to prolong market incumbency and stimulate research and development investment); John H. Barton, *Patents and Antitrust: A Rethinking in Light of Patent Breadth and Sequential Innovation*, 65 ANTITRUST L.J. 449 (1997) (advocating statutory change in patent law and evolutionary change in antitrust common law to control and balance incentives between inventors and subsequent researchers thereby encouraging research); Jerry R. Green & Suzanne Scotchmer, *On the Division of Profit in Sequential Innovation*, 26 RAND J. ECON. 20 (1995) (arguing that patents in markets with sequential innovation should continue for a longer period in

The nature of this empirical and economic scholarship, which has led to a better understanding of our patent system, can be characterized as pragmatic in its approach to, and explication of, the issues that it addresses. I refer to this literature as pragmatic because it fits nicely with the school of thought known as "legal pragmatism."[17] Although the phrase legal pragmatism is polysemous, most legal pragmatists endorse certain fundamental concepts such as empiricism, contextualism, and instrumentalism,[18] and it is these themes, to a large extent, that the aforementioned scholarship embraces. This pragmatic scholarship looks behind the curtain of theory with the goal of revealing a world that either dismantles or reaffirms our assumptions about the efficacy of patent law.

Producing first-rate pragmatic scholarship is no easy task; it takes time, sometimes plenty of money, and is risky in that a scholar's empirical data may undercut his pre-empirical normative assumptions or simply reaffirm what is already known.[19] But it is trying for another reason—that is, in any area

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order to protect the profits of the initial innovator); Howard F. Chang, *Patent Scope, Antitrust Policy, and Cumulative Innovation*, 26 RAND J. ECON. 34 (1995) (demonstrating that collusive agreements between patentees and competing inventors create incentives for inefficient entry by imitators); Suzanne Scotchmer, *Standing on the Shoulders of Giants: Cumulative Research and the Patent Law*, 5 J. ECON. PERSP. 29 (1991) (investigating the use of patent protection and cooperative agreements to protect incentives for cumulative research).

Some of the scholarship on claim scope has been industry specific. *See, e.g.*, Julie E. Cohen & Mark A. Lemley, *Patent Scope and Innovation in the Software Industry*, 89 CAL. L. REV. 1 (2001) (software); Arti Kaur Rai, *Regulating Scientific Research: Intellectual Property Rights and the Norms of Science*, 94 NW. U. L. REV. 77 (1999) (biotechnology); Vincent Chiappetta, *Defining the Proper Scope of Internet Patents: If We Don't Know Where We Want to Go, We're Unlikely to Get There*, 7 MICH. TELECOMM. & TECH. L. REV. 289 (2001) (Internet).

17. *See generally* Michael Brint & William Weaver, *Introduction* to PRAGMATISM IN LAW AND SOCIETY 2, 2 (Michael Brint & William Weaver eds., 1991) ("[O]ne of the most contested issues in the contemporary debate on pragmatism concerns the very definition of pragmatism itself.").

18. *See* Christopher J. Peters, *Foolish Consistency: On Equality, Integrity, and Justice in Stare Decisis*, 105 YALE L.J. 2031, 2040 n.32 (1996) (stating that "[l]egal pragmatism is multifaceted" but possesses certain "core themes"); *see also* POSNER, OVERCOMING LAW, *supra* note 10, at 19 ("Pragmatists want the law to be more empirical, more realistic, more attuned to the real needs of real people."); Thomas C. Grey, *What Good Is Legal Pragmatism?*, *in* PRAGMATISM IN LAW AND SOCIETY 9, 15 (Michael Brint & William Weaver eds., 1991) ("We pragmatists keep in the back of our minds the reminder that we are thinking to some end—thinking instrumentally. We also keep there a reminder that we are thinking against a background of tacit presupposition of which we can never be fully aware—thinking *contextually*.").

19. *See* Heise, *Past, Present, and Future*, *supra* note 10, at 111 ("Unfortunately, data gathering is frequently labor-intensive and time-consuming and, consequently, often quite expensive"); Craig Allen Nard, *Empirical Legal Scholarship: Reestablishing A Dialogue Between the Academy and Profession*, 30 WAKE FOREST L. REV. 347, 364 n.76 (1995) (noting the concern of scholars that empirical results will potentially undercut

of the law, a degree of complacency among policy makers and legislators has a tendency to "set in" regarding accepted theories (or theories that are espoused by special interests). In patent law, for example, it has historically been accepted that the prospect of an increasingly strong proprietary right in the form of a patent will lead to an increase in innovative activity.[20] We now know that is not true;[21] but the point is that it is difficult, and lonely at times, to question entrenched wisdom.[22]

Once produced, however, the reward can be great. Pragmatic scholarship can establish parameters to circumscribe decisionmaking and also act as an escort through complex terrain.[23] But, as shown in Part II of this article, despite its restraining force or illuminative power, this literature, with a few notable exceptions,[24] has largely been absent from the patent

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normative thesis); Edward L. Rubin, *The Concept of Law and the New Public Law Scholarship*, 89 MICH. L. REV. 792, 827 (1991) ("While all this social science can appear to be a daunting prospect to academics whose training consisted of reading appellate decisions, law professors, in theory, are able to perform social science studies."); Schuck, *supra* note 10, at 331 ("Until one gathers and analyzes the data, one cannot know whether one will make important new findings or 'merely' confirm what everybody (especially in retrospect) 'already knows.' In contrast, the articles that we typically write exhibit a kind of predestination; once we have thought our ideas through, we know where we are headed. Few surprises await us, and perhaps we prefer it that way.").

20. *See* COHEN et al., *supra* note 4, at 2.

21. Mansfield, *Patents and Innovation*, *supra* note 12, at 180 ("Despite the fact that the patent system generally is defended at least partly on the grounds that it increases the rate of innovation, the present study indicates that its effects in this regard are very small in most of the industries we studied . . . . However, in a few industries, particularly pharmaceuticals and chemicals, the effects of the patent system were reported to be very substantial.").

22. As Lawrence Lessig has written, "[I]n these times, the hardest task for social or political activists is to find a way to get people to wonder again about what we all believe is true. The challenge is to sow doubt." LAWRENCE LESSIG, THE FUTURE OF IDEAS 5 (2001).

23. *See generally* Erin Rahne Kidwell, *The Paths of the Law: Historical Consciousness, Creative Democracy, and Judicial Review*, 62 ALB. L. REV. 91, 129 (1998) ("Holmesian legal pragmatism enables one to view the Constitution as setting the parameters for the popular sovereign of "We the People" to engage in socio-cultural experimentation through the political process.").

24. For example, Judge Newman, over the past several years, has cited and discussed much of this work in her opinions. *See, e.g.,* Hilton Davis Chem. Co. v. Warner-Jenkinson, 62 F.3d 1512, 1529 (Fed. Cir. 1995) (en banc), *reversed*, 520 U.S. 17 (1997) (Newman, J., concurring). Judge Newman explicated:

> Our decision, like every decision of patent principle, affects the national interest in technologic innovation. I have sought to understand how that effect is manifested in the doctrine of equivalents. In so doing I have taken an analytic path not discussed by the court, albeit a path that I believe underlies the common law of equivalency. This path has led me into the thicket of the sociology and economics of patent law, for I have attempted to place the basic question—the role and application of the doctrine of equivalents—into the practical context of the purposes and workings of the patent system, as informed by modern scholarship.

opinions of the Federal Circuit.[25]

I have little doubt that Federal Circuit judges persistently question their empirical assumptions and have an awareness of the effect of their actions on the divergent technological communities that are an integral part of the innovation game.[26]

Id.; see also Festo Corp. v. Shoketsu Kinzoku Kogyo Kabushiki Co., 234 F.3d 558, 638-41 (Fed. Cir. 2000), *vacated by* 122 S.Ct. 1831 (2002) (Newman, J., concurring in part, dissenting in part) (discussing and citing scholarship on "innovation and competition policy"); Johnson & Johnston Assocs. Inc. v. R.E. Serv. Co., 285 F.3d 1046, 1071-72 (Fed. Cir. 2002) (en banc) (Newman, J., dissenting) (citing and discussing economic and empirical literature).

25. Commentators have noted that there is less receptivity among courts generally to empirical and social science work. *See* John Monahan & Laurens Walker, *Social Authority: Obtaining, Evaluating, and Establishing Social Science in Law*, 134 U. PA. L. REV. 477, 477-78 (1986) ("[R]eliance upon the social sciences, while no longer remarkable, is less evident in modern judicial opinions than might be expected."); Michael D. McClintock, *The Declining Use of Legal Scholarship by Courts: An Empirical Study*, 51 OKLA. L. REV. 659, 667-70 (1998) (explaining judges' and practitioners' criticisms of "impractical scholarship," which is defined, in part, as using social science tools to advocate for legal reform). It should be pointed out, however, that secondary sources are not entirely absent from Federal Circuit opinions. As we will see in Part II, *infra*, the court frequently cites treaties and practitioner-oriented journals.

26. Interestingly, Judge Newman has called for her colleagues to exercise greater awareness of consequences. *See, e.g., Johnson & Johnston*, 285 F.3d at 1064 (Newman, J., dissenting) ("It is self-evident that the placement of an increasing number of pitfalls in the path of patentees serves only as a deterrent to innovation. Before taking so deliberate a step, the court should at least consider the consequences."). In *Festo Corp. v. Shoketsu Kinzoku Kogyo Kabuskiki Co.*, she propounded:

> This spontaneous judicial action represents a venture into industrial policy whose consequences have been inadequately considered. The majority's announced purpose of facilitating competition by restricting patentees' access to the doctrine of equivalents has not been evaluated for its effect on the nation's technology-based industry, for its effect on the system of patents as an innovation incentive, or indeed for its effect on competition.

234 F.3d at 630.

Others have made similar arguments regarding constitutional adjudication and the decisionmaking process generally. *See, e.g.*, Susan R. Klein, *Identifying and (Re)formulating Prophylactic Rules, Safe Harbors, and Incidental Rights in Constitutional Criminal Procedure*, 99 MICH. L. REV. 1030, 1066 (2001) (stating that "social science and empirical data can assist the Court in developing the subsidiary rules and rights necessary to protect" constitutional norms, values, or rules); Tracey L. Meares & Bernard E. Harcourt, *Foreword: Transparent Adjudication and Social Science Research in Constitutional Criminal Procedure*, 90 J. CRIM. L. & CRIMINOLOGY 733, 736 (2000) ("[G]reater attention to empirical and social science evidence is necessary precisely in order to shed better light on the normative judgments that we make in criminal procedure."); RICHARD A. POSNER, THE PROBLEMATICS OF MORAL AND LEGAL THEORY 164 (1999) [hereinafter POSNER, PROBLEMATICS] (arguing for a greater use of social science by judges); Michael C. Dorf, *The Supreme Court, 1997 Term—Foreword: The Limits of Socratic Deliberation*, 112 HARV. L. REV. 4, 8, 56 (1998) (calling on the Court to pay "greater attention to the likely consequences of its decisions and to the empirical assumptions underlying its doctrines" and suggesting that the Court "rely to a greater extent on empirical and policy analysis in its written opinions"); Monahan & Walker, *supra* note 26, at 488 (asserting "that courts should treat social science research relevant to creating a rule of law as a source of authority rather than as a source of facts").

I suggest, however, in Part III of this article, that the judges should evidence this awareness by cautiously being more receptive to pragmatic scholarship in their published opinions. I say "cautiously" because I do not want to overstate the salutary effects of pragmatic scholarship as a common law tool; indeed, there are dangers and limitations associated with an appellate court embracing empirical/economic literature.[27] But on balance, a more pronounced obeisance toward "facts on the ground" makes sense from an adjudicative perspective.

Moreover, it is consistent with the intellectual origins of American intellectual property law. Contrary to European intellectual property law, which is grounded principally in Kantian and Hegelian notions of personality, inalienability, and self-expression,[28] American intellectual property law has traditionally been justified in terms of consequentialism.[29] By urging judges to cautiously exercise more empiricism, this article calls for a return to American patent law's intellectual roots.

In Part IV of this article, I discuss a secondary, but important, concern that pertains to judicial candor. As some scholars have argued, the court has, in recent years, begun to particularize technology.[30] That is, the court has treated

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27. Two such dangers relate to the mode of delivery of pragmatic scholarship to the Court and the ability of appellate courts to competently evaluate the scholarship. *See* Part III.B, *infra*.

28. *See* Thomas F. Cotter, *Pragmatism, Economics, and the Droit Moral*, 76 N.C. L. REV. 1, 7 (1997) (noting that "European intellectual property law . . . derives in large part from a concept of property developed by Immanuel Kant and Georg Wilhelm Friedrich Hegel"); Neil Netanel, *Copyright Alienability Restrictions and the Enhancement of Author Autonomy: A Normative Evaluation*, 24 RUTGERS L.J. 347, 378-81 (1993) (discussing the influence of Kant and Hegel on European intellectual property law).

29. *See* Mazer v. Stein, 347 U.S. 201, 219 (1954) ("The economic philosophy behind the clause empowering Congress to grant patents and copyrights is the conviction that encouragement of individual effort by personal gain is the best way to advance public welfare through the talents of authors and inventors in 'Science and the useful Arts.'"); *see also* Yochai Benkler, *Siren Songs and Amish Children: Autonomy, Information, and Law*, 76 N.Y.U. L. REV. 23, 59 (2001) (noting that "the basic ideological commitment of American intellectual property is actually heavily utilitarian, not Lockean or Hegelian"); Linda R. Cohen & Roger G. Noll, *Intellectual Property, Antitrust and the New Economy*, 62 U. PITT. L. REV. 453, 461 (2001) (asserting that "the conceptual model underlying American intellectual property law is utilitarian: rights are granted for social objectives (advancing knowledge and producing useful products)"). *But see* Adam Mossoff, *Rethinking the Development of Patents: An Intellectual History,* 1550-1800, 52 HASTINGS L.J. 1255, 1257, 1313-15 (2001) (asserting that natural rights played a role in the development of intellectual property laws); Alfred C. Yen, *Restoring the Natural Law: Copyright as Labor and Possession*, 51 OHIO ST. L.J. 517, 517 (1990) (calling for a "restoration of natural law to our copyright jurisprudence").

30. *See* Dan L. Burk & Mark A. Lemley, *Is Patent Law Technology-Specific?*, at 2, 5-6 (working draft on file with the author) (observing the inconsistent manner in which the court analyzes patents from different industries); Robert A. Hodges, *Black Box Biotech Inventions: When a "Mere Wish or Plan" Should Be Considered an Adequate Description of*

different technologies, well, differently, particularly the software and biotechnology industries.[31] I am agnostic about whether particularization is desirable; my only point is that the court has embarked on particularization without effectively explaining why or what policy goals are served. In short, my focus is one of judicial candor and why it is essential.

II. THE FEDERAL CIRCUIT AND SCHOLARSHIP IN PATENT LAW ADJUDICATION[32]

Over two hundred years ago, on Wednesday, September 5, 1787, during the closing days of the Constitutional Convention, James Madison and Charles Pinckney embraced what has come to be known as the intellectual property clause.[33] Madison and Pinckney proposed that Congress should have the power "[t]o promote the Progress of Science and useful Arts by securing for limited Times to Authors and Inventors the exclusive Right to their respective Writings and Discoveries."[34]

This provision, embodied in Article I, Section 8, Clause 8 of the Constitution, passed unanimously without debate and provides the foundation for American patent and copyright law.[35]

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the Invention, 17 GA. ST. U. L. REV. 831 (2001) (arguing that description requirements for biotechnology inventions should not be determined by the nature of their structure).

31. *See* Burk & Lemley, *supra* note 31, at 5-6.

32. For purposes of economy, I limit the present study to how often the court merely cites secondary sources, including materials in addition to empirical and social science data. I defer the important questions of why the court cited a secondary source and the influence of secondary sources, including empirical and social science scholarship, on Federal Circuit patent jurisprudence.

33. *See generally* Edward C. Walterscheid, *To Promote the Progress of Science and Useful Arts: The Background and Origin of the Intellectual Property Clause of the United States Constitution*, 2 J. INTELL. PROP. L. 1, 25-27 (1994) (discussing James Madison's and Charles Pinckney's involvement in the creation of the intellectual property clause).

34. U.S. CONST. art. I, § 8, cl. 8. The framers, employing colonial syntax as one would expect, were respectively referring to works of authors and inventors when they used the terms "Science" and "useful Arts." In the 18th century, the term "Science," from the Latin, *scire*, "to know," meant learning or knowledge in general and had no particular connection to the physical or biological sciences like it does today. *See* Karl B. Lutz, *Patents and Science: A Clarification of the Patent Clause of the U.S. Constitution,* 18 GEO. WASH. L. REV. 50, 51-52 (1949) (examining the origin of the word "science"). Thus, the operational relationships are between "authors," "science," and "writings" for copyright on the one hand and "inventors," "useful Arts," and "discoveries" for patents on the other. *See* Giles S. Rich, *Principles of Patentability*, *in* NONOBVIOUSNESS—THE ULTIMATE CONDITION OF PATENTABILITY 2:2, 2:4 (1980); Lutz, *supra*; *see generally* Walterscheid, *supra* note 34, at 1; Kenneth J. Burchfiel, *Revising the "Original" Patent Clause: Pseudohistory in Constitutional Construction*, 2 HARV. J.L. & TECH. 155, 161-62 (1989).

35. Interestingly, although the delegates convened in Philadelphia on May 14, 1787, the draft Constitution reported on August 6 did not contain a patent and copyright clause. *See* Karl Fenning, *The Origin of the Patent and Copyright Clause of the Constitution*, 17 GEO. L.J. 109, 109 (1929). But twelve days later, on August 18, Charles Pinckney of

In Federalist #43, James Madison wrote that "[t]he utility of [Article I, Section 8, Clause 8] will scarcely be questioned,"[36] and indeed, throughout the history of American intellectual property law, the importance of patent law to innovation has "scarcely" been questioned and has largely been taken for granted.[37] While few would doubt that there is a relationship between patent law and innovation practices, the nature of this relationship has not been thoroughly understood, mostly because during this time scholars, with some exceptions, did not question the underlying assumptions of our patent system.[38]

However, as noted earlier, in recent years, scholars have begun to take a closer look at our own patent system.[39] Let us take a look at the extent to which the Federal Circuit has cited this scholarship.

A. How Often Does the Federal Circuit Cite Scholarship in its Patent Law Opinions?

I reviewed every published Federal Circuit opinion from 1983 through 2000 to discern how often the court cites scholarship or a secondary source in its patent and non-patent opinions.[40] (I use the terms "scholarship" and "secondary source" interchangeably.)[41] The data are reflected in Tables 1A, 1B, 2A, and 2B. These tables, among other things, respectively reflect

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South Carolina, who was serving in the South Carolina legislature when it enacted America's first general patent and copyright provision in 1784, proposed that Congress have the power to enact patent legislation. *Id*. at 109, 113. Also, on August 18, James Madison submitted a similar proposal. *Id*. at 113. David Brearley of New Jersey, a member of the Committee of Eleven, reported to the Convention what is essentially the patent and copyright clause embodied in Article I, Section 8, Clause 8 of the Constitution. *Id*. *See generally* BRUCE W. BUGBEE, GENESIS OF AMERICAN PATENT AND COPYRIGHT LAW 10-11 (1967); Fenning, *supra*, at 109-17.

36. THE FEDERALIST NO. 43, at 278-79 (James Madison).

37. *Cf*. BUGBEE, *supra* note 36, at 11 (illustrating the significance of patent law).

38. *See, e.g.*, Senate Subcomm. on Patents, Trademarks, & Copyrights, Senate Comm. on the Judiciary, 84th Cong, 2d Sess., AN ECONOMIC REVIEW OF THE PATENT SYSTEM, 15, 20 (Comm. Print 1958) (Author Fritz Machlup) ("While the early opinions on the patent system were expressed merely in occasional comments and remarks contained in general treatises on political economy, economists during the great patent controversy of the second half of the 19th century wrote articles, pamphlets, and books on the economics of exclusive rights. The arguments for and against the patent system have not changed much since that time.")

39. Refer to notes 10-17 *supra*.

40 The opinions were produced via a Westlaw search.

41. My definition of scholarship or secondary source includes all non-governmental published materials. Thus, scholarship includes treatises (e.g., CHISUM, CHISUM ON PATENTS), law review publications (e.g., articles in the Houston Law Review), scholarly books (e.g., HOLMES'S THE COMMON LAW), bar or practitioner-oriented journal publications (e.g., articles in the Journal of the Patent & Trademark Office Society), but not judicial opinions, statutes, or regulations.

the number of patent law and non-patent law opinions with at least one secondary source.

TABLE 1A:
FEDERAL CIRCUIT PATENT OPINIONS
(1983-2000)

Year	# of appeals from DCt / PTO w/ Federal Circuit opinion[42]	# of opinions citing at least one secondary source (DCt / PTO)	% of opinions citing at least one secondary source (DCt / PTO)
1983	45 / 19	14 / 2	31.11 / 10.53
1984	109 / 13	36 / 2	33.03 / 15.38
1985	77 / 26	30 / 7	38.96 / 26.92
1986	93 / 15	29 / 4	31.18 / 26.67
1987	81 / 13	28 / 3	34.57 / 23.08
1988	79 / 15	36 / 2	45.57 / 13.33
1989	69 / 14	23 / 3	33.33 / 21.43
1990	89 / 25	32 / 1	35.96 / 4.0
1991	98 / 28	32 / 3	32.65 / 10.71
1992	116 / 34	23 / 3	19.83 / 8.82
1993	124 / 35	24 / 2	19.35 / 5.71
1994	102 / 24	17 / 6	16.67 / 25.00
1995	143 / 23	28 / 3	19.58 / 13.04
1996	171 / 17	33 / 0	19.30 / 0.00
1997	191 / 27	26 / 4	13.61 / 14.81
1998	193 / 14	33 / 5	17.10 / 35.71
1999	189 / 16	26 / 0	13.76 / 0.00
2000	198 / 14	19 / 2	9.60 / 14.29

42. PTO here means appeals from the Board of Patent Appeals and Interferences.

TABLE 1B:
FIVE-YEAR BREAKDOWN OF FEDERAL CIRCUIT PATENT OPINIONS

Years	# of opinions (DCt / PTO)	% of opinions citing at least one secondary source (DCt / PTO)
1996-2000	942 / 88 (Total = 1,030)	Mean = 14.67 / 12.96 Median = 13.76 / 14.29
1991-1995	583 / 144 (Total = 727)	Mean = 21.62 / 12.66 Median = 19.58 / 10.71
1986-1990	411 / 82 (Total = 493)	Mean = 36.12 / 17.70 Median = 34.57 / 21.43
1983-1985	231 / 58 (Total = 289)	Mean = 34.37 / 17.61 Median = 33.03 / 15.38

TABLE 2A:
FEDERAL CIRCUIT NON-PATENT
OPINIONS FROM LOWER TRIBUNALS[43]

Year	# of opinions	# of opinions citing at least one secondary source	% of opinions citing at least one secondary source
1983	110	18	16.36
1984	137	18	13.13
1985	177	29	16.38
1986	212	19	8.96
1987	175	18	10.29
1988	154	25	16.23
1989	107	20	18.69
1990	218	23	10.55
1991	350	25	7.14
1992	444	14	3.15
1993	463	38	8.42
1994	373	24	6.43
1995	594	22	3.69
1996	584	20	3.42
1997	484	32	6.61
1998	441	21	4.76
1999	537	26	4.84
2000	528	17	3.22

43. Lower tribunals include: (1) Merit Systems Protection Board; (2) Court of Federal Claims; (3) Court of International Trade; (4) Armed Services Board of Contract Appeals; (5) PTO: Trademark Trial and Appeals Board; (6) International Trade Commission; and (7) Veterans Administration Board of Contract Appeals.

TABLE 2B:
A FIVE-YEAR COMPARISON OF FEDERAL CIRCUIT NON-PATENT OPINIONS

Years	# of opinions	% of opinions citing at least one secondary source
1996-2000	2,574	Mean = 4.57; Median = 4.76
1991-1995	2,224	Mean = 5.77 ; Median = 6.43
1986-1990	866	Mean = 11.06; Median = 10.29
1983-85	424	Mean = 15.29; Median = 16.36

B. What is Cited?

TABLE 3:
FEDERAL CIRCUIT PATENT OPINIONS

Year	Treatises[44]	Bar Journals[45]	Law Reviews[46]
1983	10	8	2
1984	49	20	18[47]
1985	50	18	15[48]
1986	36	6	3
1987	43	11	5
1988	41	16	19[49]
1989	35	8	7
1990	30	7	2
1991	47	8	7
1992	33	10	12
1993	35	8	7

44. A treatise is defined as a one volume or multi-volume publication published by a commercial publisher (e.g., CHISUM, CHISUM ON PATENTS or WRIGHT & MILLER, FEDERAL PRACTICE AND PROCEDURE).

45. A bar journal is defined as a publication that is published by a non-law school organization and has as its primary audience members of the bar (e.g., Journal of Patent & Trademark Office Society or American Intellectual Property Law Association Quarterly Journal).

46. Law review is defined as a primary and secondary review or journal published by a law school (e.g., Houston Law Review or Harvard Journal of Law & Technology).

47. Nine of the eighteen "law review" cites are from two cases, TP Labs., Inc. v. Prof'l Positioners, Inc., 724 F.2d 965 (Fed. Cir. 1984) and Structural Rubber Prods. Co. v. Park Rubber Co., 749 F.2d 707 (Fed. Cir. 1984).

48. Nine of the fifteen law review cites are from one case, SRI Int'l v. Matsushita Elec. Corp. of America, 775 F.2d 1107 (Fed. Cir. 1985).

49. Ten of the nineteen law review cites are from one case, Newell Co. v. Kenney Mfg. Co., 864 F.2d 757 (1988).

Year	Treatises[44]	Bar Journals[45]	Law Reviews[46]
1994	36	17[50]	5
1995	65	12	32[51]
1996	32	3	11[52]
1997	29	3	6[53]
1998	49	11	12
1999	33	3	2
2000	27	3	7[54]

Of all of the treatise citations, 22.21% (680 total/151 cites) were to James Wm. Moore, MOORE'S FEDERAL PRACTICE; 19.12% (680/130) were to Charles Alan Wright and Arthur Miller, FEDERAL PRACTICE AND PROCEDURE; and 17.80% (680/121) were to Donald S. Chisum, CHISUM ON PATENTS. These three treatises account for nearly 60% of treatise citations. The most frequently cited bar journal was the *Journal of the Patent and Trademark Office Society*, which accounted for 46.5% of all bar journal citations. The most frequently cited bar journal article was P.J. Fedrico's *Commentary on the New Patent Act*, 35 USCA 1 (West. 1954), which was cited in thirty-five opinions. The law review citations were widely dispersed among law reviews, with no single law review or law review article getting much play.

C. IP Scholarship at the Second and Ninth Circuits

By way of comparison, I looked at the trademark and copyright jurisprudence of the Second and Ninth Circuits. During the years 1996-2002, these courts of appeals, in their copyright and trademark opinions, have cited to scholarship considerably more often than the Federal Circuit has in its patent law opinions. But, like the Federal Circuit, the Second and Ninth Circuits are more

50. Twelve of the seventeen bar journal cites are from one case, *In re* Alappat, 33 F.3d 1526 (Fed. Cir. 1994).

51. Twenty-seven of the thirty-two law review citations are from four cases, three of which were heard en banc, Hilton Davis Chem. Co. v. Warner-Jenkinson Co., 62 F.3d 1512 (Fed. Cir. 1995) (en banc); *In re* Lockwood, 50 F.3d 966 (Fed. Cir. 1995); Rite-Hite Corp. v. Kelley Co., 56 F.3d 1538 (Fed. Cir. 1995) (en banc); and Markman v. Westview Instruments, Inc., 52 F.3d 967 (Fed. Cir. 1995) (en banc).

52. Six of the eleven law review cites are from one case, Cochran Consulting, Inc. v. Uwatec USA, Inc., 102 F.3d 1224 (Fed. Cir. 1996).

53. Five of the six law review cites are from one case, Lough v. Brunswick Corp., 103 F.3d 1517 (Fed. Cir. 1997).

54. Five of the seven law review cites are from one case, Festo Corp. v. Shoketsu Kinzoku Kogyo Kabuskiki Co., 234 F.3d 558 (Fed. Cir. 2000), *vacated by* 122 S. Ct. 1831 (2002).

inclined to cite to a treatise than a law review article. See Tables 4A-C:

TABLE 4A:
SECOND CIRCUIT COPYRIGHT AND TRADEMARK OPINIONS

Years	# of © & TM opinions	# of © & TM opinions citing at least one secondary source	Treatises cited (%) / Law Reviews cited (%)	% of opinions citing at least one secondary source
1996-2000	85	48	48 (56.5%) / 20 (23.5%)	56.5

TABLE 4B:
NINTH CIRCUIT COPYRIGHT AND TRADEMARK OPINIONS

Years	# of © & TM opinions	# of © & TM opinions citing at least one secondary source	Treatises cited (%) / Law Reviews cited (%)	% of opinions citing at least one secondary source
1996-2000	83	54	52 (62.7%) / 13 (15.7%)	65.1

TABLE 4C:
A FIVE-YEAR COMPARISON AMONG THE SECOND, NINTH, AND FEDERAL CIRCUITS

Years	(CAFC) # of patent opinions from DCt / % of patent opinions citing at least one secondary source / Treatise-law review citation ratio	(2d Circuit) # of TM & copyright opinions / % of opinions citing at least one secondary source / Treatise- law review citation ratio	(9th Circuit) # of TM & copyright opinions / % of opinions citing at least one secondary source / Treatise- law review citation ratio
1996-	942 /14.67% /	85 / 56.5% /	83 / 65.1% / 4:1

2000	4.47:1	2.4:1	

Although each circuit cites treatises more often than law review articles,[55] the empirical data reveal that the Second and Ninth Circuits cite scholarship roughly four times as often as the Federal Circuit. What are the reasons for this disparity? One reason may be that the Federal Circuit is more familiar and comfortable with patent law than the Ninth and Second Circuits are with trademark and copyright law, and, therefore, Federal Circuit judges may feel a diminished need to consult the secondary literature. (The Federal Circuit decides considerably more patent cases than the Second and Ninth Circuits decide trademark and copyright cases—about eleven patent cases to one copyright or trademark case during 1996-2000.) Another way of putting it is that the Second and Ninth Circuits' docket is more diverse than the Federal Circuit's, a situation that may lead to greater reliance on secondary authority. Also, perhaps the judges on the Second and Ninth courts of appeals are drawn more from the academy than Federal Circuit judges and, therefore, come from a culture that is more receptive to academic scholarship; or maybe there is more trademark and copyright scholarship from which to choose.

III. THE BENEFITS AND LIMITATIONS OF ADJUDICATIVE EMPIRICISM

A. A Case for Cautious Obeisance

The common law can be slow to respond to changing conditions, but the Federal Circuit's common law relating to patents evolves relatively quickly, rendering it unique in this regard.[56] This rapid pace, due largely to the court's exclusive subject matter jurisdiction in patent law,[57] has both positive and negative effects. One negative effect is that a brisk common law can give the impression that the court's jurisprudence is chaotic

55. As Table 4C indicates, the treatise-law review citation ratio for each circuit is as follows: CAFC (appeals from district courts) 4.47:1; Second Circuit 2.4:1; and the Ninth Circuit 4:1.

56. *See* Randall R. Rader, *The United States Court of Appeals for the Federal Circuit: The Promise and Perils of a Court of Limited Jurisdiction*, 5 MARQ. INTELL. PROP. L. REV. 1, 3-4 (2001) (comparing the frequency with which the Federal Circuit decides patent cases to other circuit courts' resolution of copyright cases and concluding that "on the average, the Federal Circuit is resolving cases and developing the [patent] law—evolving it in the common law fashion that we are very familiar with—at twenty-five times the pace of the average circuit").

57. *See* 28 U.S.C. § 1295 (2000).

or overreaching.[58] A positive effect, which is more germane for present purposes, allows the court to address evolving technologic conditions and associated legal issues more readily. Nonetheless, there is only so much the common law's episodic approach can accomplish in a technologic context. The common law remains a blunt instrument when analyzing transient technologies, and the court's institutional position limits its ability to determine what issues come before it and when. Thus, the window of resolution is oftentimes small, forcing the court to take advantage of its opportunities to resolve doctrinal and policy-related conflicts when it has the opportunity. With this in mind, empirical and economic scholarship can be viewed as giving the players in the patent game more "bang for their buck," allowing the court, during these precious adjudicative moments, to focus more clearly on the issues at hand. As such, pragmatic scholarship acts as a steel that can sharpen common law analysis, leading to a more precise resolution of issues that are likely to reflect conditions on the ground more accurately than can be obtained with traditional forms of common law analysis.

Indeed, economic and empirical scholarship can be influential.[59] Although I do not want to overstate the benefits or authoritative weight of this type of scholarship, its influence is grounded in the recognition that it can serve as a yardstick with which to compare competing policy concerns.[60] In this regard, empirical and economic scholarship not only serves as a compass, but can also establish juridical boundaries for the court's

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58. For example, Judge William Young recently noted:

> Almost since its inception, the Federal Circuit has been dogged with criticism for straying from the path carefully delineated for appellate tribunals. Disappointed litigants and commentators alike have criticized the court for fact-finding and other forms of hyperactive judging. Increasingly, the bar is expressing concern over the court's decision-making procedures and its apparent willingness to take over the roles of patent examiner, advocate and trier of fact.

Control Res., Inc. v. Delta Elecs., Inc., 133 F. Supp. 2d 121, 123-24 (D. Mass. 2001) (footnotes omitted).

59. *See* POSNER, PROBLEMATICS, *supra* note 26, at 228-29 (discussing the influence of law and economics scholarship on the development of antitrust law and policy); Monahan & Walker, *supra* note 26, at 477 ("Once heretical, the belief that empirical studies can influence the content of legal doctrine is now one of the few points of general agreement among jurists."). *But see* E. Allan Farnsworth, *Law Is a Sometime Autonomous Discipline*, 21 HARV. J.L. & PUB. POL'Y 95, 97-98 (1997) (discussing the limited amount of law and economic citations in judicial opinions); Jeffrey L. Harrison, *Trends and Traces: A Preliminary Evaluation of Economic Analysis in Contract Law*, 1988 ANN. SURV. AM. L. 73 (noting the limited instances where judges have found economic analysis relevant, e.g., when working within established rules).

60. *Cf.* Monahan & Walker, *supra* note 26, at 488-50 (discussing the importance of empirical research as a source of authority).

decisionmaking.[61]

Interpreting the patent code and the common law are normative endeavors, but the court verges on the abstract by failing to give adequate weight to empirical and economic scholarship. The more the court's pronouncements diverge from facts on the ground, as reflected in the pragmatic scholarship, the more the court's legitimacy will be called into question.[62] Of course, judges judge and, because of this discretion, it would be a mistake to infer that an authoring judge (or panel) ignored "relevant" scholarship or was not aware of such simply because this scholarship was not cited in the resulting opinion. It may well be that the judge was unpersuaded by what the scholarship evinced or believed that more traditional forms of analysis (e.g., precedent) were sufficient to support his position. But I would argue that as a general matter, a judge should err on the side of citation or, more dramatically, offer a discussion of the cited scholarship. At the very least, one can argue that an opinion that cites (and discusses) empirical and economic scholarship has a signaling effect; it tells the relevant community that the court is aware of its surrounds and understands that its decisions have particular consequences.[63] It would also contribute to the

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61. *See* David L. Faigman, *"Normative Constitutional Fact-Finding": Exploring the Empirical Component of Constitutional Interpretation,* 139 U. PA. L. REV. 541, 612 (1991) [hereinafter Faigman, *Constitutional Fact-Finding*] ("Empirical research places an especially cogent check on judicial decision-making by clarifying the factual premises upon which legal judgments are based."); Dean M. Hashimoto, *Justice Brennan's Use of Scientific and Empirical Evidence in Constitutional and Administrative Law*, 32 B.C. L. REV. 739, 742 (1991) (discussing Justice Brennan's use of "scientific information as a judicial check on the actions of government"). In a previous work, I argued that the science and the norms of a scientific community should serve as checks on patent law adjudication and legislation. *See* Craig Allen Nard, *A Theory of Claim Interpretation*, 14 HARV. J.L. & TECH. 1 (2000).

An example of a judge recognizing the guiding force and constraining power of pragmatic scholarship can be found in Justice Blackmun's concurring remarks in *United States v. Leon*, 468 U.S. 897 (1984). There, the Court narrowed the scope of the exclusionary rule based on vague empirical evidence. Justice Blackmun cautioned that the Court's "empirical judgment . . . is a provisional one." *Id*. at 928. Therefore, Justice Blackmun continued:

> [i]f it should emerge from experience that, contrary to our expectations, the good-faith exception to the exclusionary rule results in a material change in police compliance with the Fourth Amendment, we shall have to reconsider what we have undertaken here. The logic of a decision that rests on untested predictions about police conduct demands no less.

Id.

62. For a discussion of judicial legitimacy, see Susan P. Sturm, *A Normative Theory of Public Law Remedies*, 79 GEO. L.J. 1355, 1390-411 (1991); s*ee also* Laurence R. Helfer & Anne-Marie Slaughter, *Toward a Theory of Effective Supranational Adjudication*, 107 YALE L.J. 273, 284 (1997) (listing components of judicial legitimacy).

63. Without the court taking the lead in elevating the importance of pragmatic scholarship, there is virtually no incentive for litigants to invest the time to understand

development of a pragmatic culture—an environment where patent doctrine and policy can constantly be subject to maintenance.

B. The Limitations of Using Scholarship in Decisionmaking

I do not wish to leave you with the impression that there are only benefits to be derived from the court's increased reliance on, citation to, and discussion of, empirical and economic scholarship. In the first paragraph of this article, I invoked Burke's cautionary words and wrote that contingencies are plentiful. What I mean is that there are profound concerns about the Federal Circuit's use of empirical and social science scholarship that apply to any appellate court. I discuss two such concerns.

1. Mode of Delivery. Given the appellate courts' institutional position, the first concern relates to the most suitable vehicle for delivery of empirical and social science scholarship.[64] Some have argued that the parties before the court should present the latter with empirical or social science research in their respective briefs.[65] But just as judges judge,

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fully what can be recondite literature.

64. Appellate courts simply do not have the institutional capability to obtain empirical information. *See* Posner, *supra* note 10, at 12 ("The capability of the courts to conduct scientific or social scientific research is extremely limited, and perhaps nil."); Dorf, *supra* note 27, at 51 (noting that the Supreme Court's "institutional posture and adjudicatory methods constrain its ability to learn about the world in which its doctrines operate"). With respect to the Federal Circuit specifically, see Arti K. Rai, *Intellectual Property Rights in Biotechnology: Addressing New Technology*, 34 WAKE FOREST L. REV. 827, 837 (1999) (asserting that the Federal Circuit has "institutional constraints . . . [including a lack of resources to] expand its decisionmaking capacity to keep pace with the expansion of technology").

65. *See* Ellie Margolis, *Beyond Brandeis: Exploring the Uses of Non-Legal Materials in Appellate Briefs*, 34 U.S.F. L. REV. 197, 235 (2000) ("Lawyers should take an active role in using non-legal materials as authority in appellate briefs, and law schools should take a more active role in educating prospective lawyers about effectively use [sic] non-legal authority."); Monahan & Walker, *supra* note 26, at 495-97 (discussing the benefits of presenting scientific research in the form of written briefs); *see also* Hilton Davis Chem. Co. v. Warner-Jenkinson Co., 62 F.3d 1512, 1529 (Fed. Cir. 1995) (Newman, J., concurring) ("The parties and the *amici curiae* did not discuss this public interest aspect, although the consequences of our decision, as for all law, extend beyond those of the parties involved in the specific dispute."); *Judge Michel Presses for More Data and Rigor in Patent Reform Process*, 63 PAT. TRADEMARK & COPYRIGHT J. (BNA) 429, 430 (Mar. 22, 2002) (paraphrasing a speech delivered by Judge Paul Michel of the Federal Circuit at the University of California at Berkeley's Boalt Hall School of Law as follows:

> [W]hen the court is asked to reconsider established patent law understandings, [Judge Michel] added, it must rely on the briefs, and those filings rarely contain any "data, facts, or hard numbers" to substantiate the policy arguments being advocated by the litigants.

Id.

advocates advocate. Thus the court must exercise caution in its reliance on scholarship cited by appellant and appellee. While that could be said about almost anything the parties submit to the court, there is a certain disarming veneer of objectivity (or credibility) that accompanies pragmatic scholarship. Although amicus briefs can provide empirical data or social science research to the court in a seemingly more objective fashion, amici writers are not without agendas and may distort information to serve their goals.[66] Perhaps judges can dispatch their respective clerks to conduct rigorous searches in the social science databases—clearly clerks are capable of such (although perhaps not as much as an expert staff member of Congress)—but in the end having clerks spend hours researching the social science literature on innovation policy is probably ill-advised given that there are other pressing tasks for which a Federal Circuit clerk is responsible.

2. Sifting the Wheat from the Chaff: The Question of Evaluating Scholarship. Closely related to the delivery issue is the evaluative issue. Although the pragmatic patent law scholarship that I cited earlier in this article is first rate,[67] some scholarship is mediocre or sub-par.[68] In other words, the court needs tools to evaluate and distinguish legitimate scholarship from so-called "junk science," including issues related to methodology.[69] How can these crucial evaluative requirements

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66. *See* Michael Rustad & Thomas Koenig, *The Supreme Court and Junk Social Science: Selective Distortion in Amicus Briefs*, 72 N.C. L. REV. 91, 143 (1993) (discussing "techniques used by amici to create a misperception without actually falsifying the social science findings" and concluding that the "current mechanism of amici curiae briefs encourages advocates to selectively report social science findings to the Court"). For a discussion of the effect of amicus briefs on Supreme Court jurisprudence, see Joseph D. Kearney & Thomas W. Merrill, *The Influence of Amicus Curiae Briefs on the Supreme Court*, 148 U. PA. L. REV. 743 (2000).

67. Refer to notes 10-17 *supra* and accompanying text (discussing empirical and economic scholarship).

68. *See* Epstein & King, *supra* note 11, at 12 n.29 (cautioning that courts will "open themselves up to severe criticism" if they "make use of data resulting from improperly conducted studies"); Klein, *supra* note 27, at 1067 (asserting that there are risks when a court uses social science or empirical data because "there is quite a bit of unreliable junk science and advocacy statistics out there"); Rustad & Koenig, *supra* note 69, at 152 (counseling against the use of "junk social science" presented in amicus curiae briefs); David L. Faigman, *To Have and Have Not: Assessing the Value of Social Science to the Law as Science and Policy*, 38 EMORY L.J. 1005, 1079 (1989) [hereinafter Faigman, *To Have and Have Not*] (noting that "[t]he problem of integrating social science research into the legal process is complicated by the fact that not all social science is created equal").

69. This fact may help explain the court's reluctance in embracing pragmatic scholarship. Recall the intense protests that ensued after the Supreme Court's citation of psychological research in *Brown v. Board of Education*, 347 U.S. 483 (1954). These remonstrations primarily focused on the methodology and use of the research. *See, e.g.*,

be realized?[70] Because of institutional limitations and the traditional educational grounding of judges (and practicing attorneys), it is questionable whether the Federal Circuit (or any appellate court) has the ability to evaluate empirical and economic work in a sufficiently thorough manner.[71] This limitation will lead to a lack of receptivity of pragmatic

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Clarence Thomas, *The Higher Law Background of the Privileges or Immunities Clause of the Fourteenth Amendment*, 12 HARV. J.L. & PUB. POL'Y 63, 68 (1989) (asserting that the Court relied on "dubious social science"); ABRAHAM L. DAVIS & BARBARA LUCK GRAHAM, THE SUPREME COURT, RACE, AND CIVIL RIGHTS 121-25 (1995) (reviewing criticisms of the Court's use of social science in *Brown v. Board of Education*); Faigman, *To Have and Have Not*, *supra* note 71, at 1040 ("By far the favorite catalyst for the dire predictions surrounding claims of social scientific indeterminancy is footnote eleven of *Brown*."); Herbert Hovenkcamp, *Social Science and Segregation Before Brown*, 1985 DUKE L.J. 624, 627 (1985) ("[T]he law of race relations [at the time of *Plessy v. Ferguson*] was a product of the period's social science, just as the law of race relations developed by the Warren Court during the *Brown* era was a product of the social science of that period."); Kenneth B. Clark, *The Desegregation Cases: Criticism of the Social Scientist's Role*, 5 VILL. L. REV. 224 (1960).

70. An interesting proposal has been put forth by Professors Monahan and Walker. Based on their proposal that social science scholarship should have the weight of authority of law, they argue that courts should evaluate social science research in an analogous manner in which legal precedent is evaluated. They write:

> [T]he principles courts use to distinguish cases in terms of their precedential worth bear a striking similarity to the principles used by social scientists to distinguish research studies in terms of their scientific worth. We propose, therefore, that courts evaluate scientific research studies along four dimensions analogous to the four dimensions used to evaluate case precedent. Courts should place confidence in a piece of scientific research to the extent that the research (1) has survived the critical review of the scientific community; (2) has employed valid research methods; (3) is generalizable to the case at issue; and (4) is supported by a body of other research.

Monahan & Walker, *supra* note 26, at 498-99.

71. *See* Michael J. Saks, *Merlin and Solomon: Lessons From the Law's Formative Encounters with Forensic Identification Science*, 49 HASTINGS L.J. 1069, 1116 (1998) (noting that courts "have limited capacity and limited time to interpret and evaluate the empirical studies"); Craig v. Boren, 429 U.S. 190, 204 (1976) ("It is unrealistic to expect either members of the judiciary or state officials to be well versed in the rigors of experimental or statistical technique"); Ethyl Corp. v. EPA, 541 F.2d 1, 67 (D.C. Cir. 1976) (Bazelon, C.J., concurring) (noting that "substantive review of mathematical and scientific evidence by technically illiterate judges is dangerously unreliable"). *But see* Faigman, *To Have and Have Not*, *supra* note 71, at 1081-82 (discussing ways of making social science literature more accessible to lawyers and legal decisionmakers).

Does this mean Congress, armed with its expert staffs and fact-finding apparatus, is better equipped to produce judicious reform? Not necessarily. *See* James J. White, *Phoebe's Lament*, 98 MICH. L. REV. 2773 (2000) (discussing the lack of influence empirical work has on legislators); *see also Judge Michel Presses for More Data and Rigor in Patent Reform Process*, *supra* note 68, at 429-30 (noting that Judge Michel stated in an interview that, due to the complexity of patent law, Congress is "not well equipped to legislate in a careful and informed way"). For a response to Judge Michel's comments about Congress's ability to legislate in the area of patent law, see *Patent Law Reform Commission is No 'Silver Bullet,' Rep. Coble Says*, 63 PAT. TRADEMARK & COPYRIGHT J. 528 (Apr. 19, 2002). For a reply to Representative Coble's remarks, see *Michel Letter To Coble Denies Extreme Views on Patent Law Reform*, 63 PAT. TRADEMARK & COPYRIGHT J. 547 (Apr. 26, 2002).

scholarship, which in turn may imply that the court is not in tune with the technologic communities that its decisions affect.

A related concern that exacerbates this problem is that there is rarely a monolithic or universal viewpoint in the realm of patent law and innovation policy. Indeed, sometimes there are simply no answers.[72] As Richard Brunell writes, "if the vast economics literature on intellectual property conveys one message, it is that the relationship between intellectual property protection and economic welfare is unclear."[73] But that is not to suggest there are no answers. Each pragmatic work, by contributing a piece to the IP puzzle, is a Rosetta stone adding resolution at the feature level. And, to the extent answers remain unclear, we should continue, as the economist Fritz

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72. Judge Easterbrook makes this much clear when he writes:

> Patent law, copyright law, trademark law, and the law of contracts (of which trade secrets are a branch) create or employ property rights in information so that the producer of intellectual property can charge more than marginal cost, and thus cover the total cost of producing and disseminating the works . . . . Just *how much* above marginal cost should the price be? No one knows. A patent gives the inventor the right to exclude competition for 20 years, and thus to collect an enhanced price for that period. Is 20 years too long, too short, or just right? No one knows. A copyright lasts the life of the author plus an additional period that Congress keeps increasing in response to producers' lobbying. What is the right length of a copyright? No one knows. A trademark lasts forever (or at least for as long as the product is made, and the name does not become generic in the public's mind). A trade secret . . . lasts as long as the developer can keep the secret. Are these durations optimal? No one knows. How much use, and by whom, should be permitted without compensation under the fair use doctrine? No one knows.

Frank H. Easterbrook, *Who Decides the Extent of Rights in Intellectual Property? in* EXPANDING THE BOUNDARIES OF INTELLECTUAL PROPERTY 406 (Rochelle Cooper Dreyfuss et al. eds., 2001).

73. Richard M. Brunell, *Appropriability in Antitrust: How Much is Enough?*, 69 ANTITRUST L.J. 1, 4 (2001); *see also* George L. Priest, *What Economists Can Tell Lawyers About Intellectual Property: Comment on Cheung*, *in* THE ECONOMICS OF PATENTS AND COPYRIGHTS, 8 RES. L. & ECON. 19, 21 (1986) ("[I]n the current state of knowledge, economists know almost nothing about the effect on social welfare of the patent system or of other systems of intellectual property."); Louis Kaplow, *The Patent-Antitrust Intersection: A Reappraisal*, 97 HARV. L. REV. 1815, 1833 (1984) ("[O]ur knowledge is inadequate to inspire great confidence even in the desirability of having a patent system at all . . . ."); Senate Subcomm. on Patents, Trademarks, & Copyrights, Senate Comm. on the Judiciary, 85th Cong., 2d Sess., AN ECONOMIC REVIEW OF THE PATENT SYSTEM, 15, 79-80 (Comm. Print 1958) (Author Fritz Machlup) ("No economist, on the basis of present knowledge, could possibly state with certainty that the patent system, as it now operates, confers a net benefit or a net loss upon society. The best he can do is to state assumptions and make guesses about the extent to which reality corresponds to these assumptions."). *But see* Festo Corp. v. Shoketsu Kinzoku Kogyo Kabushiki Co., 234 F.3d 558, 639 (Fed. Cir. 2000), *vacated by* 122 S.Ct. 1831 (2002) (Newman, J., concurring in part, dissenting in part) ("It has long been understood that technological advance and industrial vigor flow from legal and economic polices that encourage invention and support investment in the products of invention.").

Machlup suggests, "to muddle through."[74]

IV. JUDICIAL CANDOR AND THE PARTICULARIZATION OF TECHNOLOGY

Over the last decade, the Federal Circuit, through its interpretation of the patent law, has engaged in the particularization of technology.[75] Specifically, the court has applied supposedly *a*technological statutory provisions differently to biotechnology and software-related inventions.[76] In this article, I am agnostic as to whether particularization is desirable; my only point here is that when crafting its opinions, the Federal Circuit should exercise more candor,[77] not only in recognizing this particularization, but, more importantly, explaining the policies advanced by such.[78]

Given the value the law places on judicial candor,[79] we can only speculate as to why the court has not been more candid. The common law of patents and an overwhelming portion of Title 35 are technologically-neutral.[80] As such, perhaps the court

74. *See* AN ECONOMIC REVIEW OF THE PATENT SYSTEM, *supra* note 76, at 80.

75. *See* Burk & Lemley, *supra* note 31, at 2, 5-6; Hodges, *supra* note 31, at 833.

76. This particularization primarily relates to the nonobviousness (35 U.S.C. § 103 (2000)) and written description (35 U.S.C. § 112 (2000)) requirements, and can be seen in the following cases: Lockwood v. Am. Airlines, Inc., 107 F.3d 1565 (Fed. Cir. 1997) (software); Fonar Corp. v. General Elec. Co., 107 F.3d 1543 (Fed. Cir. 1997) (software); N. Telecom, Inc. v. Datapoint Corp., 908 F.2d 931 (Fed. Cir. 1990) (software); Enzo Biochem, Inc. v. Gen-Probe Inc., 285 F.3d 1013 (Fed. Cir. 2002) (biotechnology); Regents of the Univ. of Cal. v. Eli Lilly & Co., 119 F.3d 1559 (Fed. Cir. 1997) (biotechnology); *In re* Bell, 991 F.2d 781 (Fed. Cir. 1993) (biotechnology); Fiers v. Revel, 984 F.2d 1164 (Fed. Cir. 1993) (biotechnology).

77. By "candid" or "candor" I am not referring to truthfulness; rather, I mean an ethos recognition and openness.

78. In a recent dissenting opinion, Judge Dyk candidly recognized the court's distinct treatment of biotechnology, but stopped short of a doctrinal and policy-based discussion. *See Enzo Biochem* 285 F.3d at 1025 (Dyk, J., dissenting) (stating that the court's imposition of a "unique written description requirement in the field of biotechnology[] is open to serious question").

79. As Scott Idleman writes, it has traditionally been held that "candor is an ideal toward which judges should almost always aspire and that any exceptions to this rule are few and far between." Scott C. Idleman, *A Prudential Theory of Judicial Candor*, 73 TEX. L. REV. 1307, 1309 (1995); *see also* Susan Estrich, *The Justice of Candor*, 74 TEX. L. REV. 1227, 1228 (1996) ("It is precisely because of its underlying political nature that the task of judging . . . demands both rigor and candor."); Shapiro, *supra* note 10 (discussing the importance of judicial candor); Nicholas S. Zeppos, *Judicial Candor and Statutory Interpretation*, 78 GEO. L.J. 353, 401-02 (1989) (discussing values associated with judicial candor); GUIDO CALABRESI, A COMMON LAW FOR THE AGE OF STATUTES 178-81 (1982) (discussing benefits of judicial candor).

80. *See* Anne H. Chasser, *Developments at the United States Patent and Trademark Office*, 19 TEMP. ENVTL. L. & TECH. J. 27, 30 (2000) ("One of the foundations of our patent system is that it is technology-neutral, in that it aims to apply the same norms to all inventions in all technologies.")

believes that its lack of candor helps maintain the perception of continuity, an important judicial value; or the court may be skeptical about the potential onslaught of interest group activity that usually accompanies industry-specific rules and regulations. There may also be the important practical concern of getting the votes to form a majority; as Susan Estrich notes, "[c]andor doesn't necessarily win votes."[81]

Whatever the cause, as a matter of judicial legitimacy, there is nothing wrong with treating different technologies differently under the patent law. In fact, Congress's tweaking of the patent code in recent years has long since dispelled the notion of technologic neutrality.[82] Technology advances, sometimes very quickly,[83] and the law is a dynamic social instrument that must adjust to changing circumstances. But when candor is lacking, legitimacy is called into question and cynicism is engendered.[84] Judges, who have "neither force nor will, but merely judgment,"[85] must present the basis and rationale for their decisions. The reason (or one reason) is obvious—explication imposes constraints on the judiciary because it allows outsiders to debate the merits and persuasiveness of these unelected officials' work product. And, as David Shapiro writes, "[i]n the absence of an obligation of candor, this constraint would be greatly diluted."[86]

With respect to particularization, candor would better enable members of the bar, commentators, and policymakers to debate openly whether treating software and biotechnology differently makes sense given what we know about the innovation game within these industries. Of course, inferences can be drawn and

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81. Estrich, *supra* note 82, at 1228.

82. *See, e.g.*, 35 U.S.C. § 103(b) (2000) (providing a more lenient nonobviousness standard for biotechnology processes); 35 U.S.C. § 287 (2000) (proscribing the enforcement of medical procedure patents); 35 U.S.C. §§ 155, 156 (2000) (extending patent term for pharmaceutical patents).

83. *See, e.g.,* William Boulier, *Sperms, Spleens, and Other Valuables: The Need to Recognize Property Rights in Human Body Parts*, 23 HOFSTRA L. REV. 693, 695 (1995) ("Unfortunately, the law is often slow to come to grips with technology, especially when technology advances so quickly.")

84. *See* Shapiro, *supra* note 10, at 737 ("[L]ack of candor seldom goes undetected for long, and its detection only serves to increase the level of cynicism about the nature of judging and of judges.")

85. THE FEDERALIST NO. 78, at 428 (Alexander Hamilton), *reprinted in* THE FEDERALIST: A COLLECTION OF ESSAYS BY ALEXANDER HAMILTON, JOHN JAY AND JAMES MADISON (1901).

86. Shapiro, *supra* note 10, at 737; *see also* Estrich, *supra* note 82, at 1228 ("If the cases are in conflict, acknowledge it, and be clear about the principle that guides you in one direction or another. It is precisely because of its underlying political nature that the task of judging, of interpreting the Constitution in particular, demands both rigor and candor."); Robert A. Leflar, *Honest Judicial Opinions*, 74 NW. U. L. REV. 721, 723, 740-41 (1979) (discussing the importance of honesty in judicial opinions).

discussions can occur based on guarded judicial opinions, but surely the debate (and the law) would benefit from greater candor.[87]

V. CONCLUSION

There is much to be said for pragmatic scholarship. Both illuminative and constraining, consideration of empirical work and social science scholarship can lead to decisionmaking that is more reflective of facts on the ground. But no matter how valuable this work is to our understanding of the patent system, we should be cognizant of its limitations. In other words, cautious obeisance is the order of the day.

87. *See generally* Idleman, *supra* note 82 (examining rationale to support conventional wisdom that candor is both a virtue and a requirement of judges and proposing a methodology for determining when judicial order is appropriate).