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Patent Inflation

ABSTRACT. For more than two decades, the Patent and Trademark Office (PTO) and the Federal Circuit have exercised nearly complete institutional control over the patent system. Yet in recent years their stewardship has been widely criticized, largely on the basis of two particular failings. First, the PTO grants significant numbers of invalid patents, patents that impose substantial costs on innovative firms. And second, over time the Federal Circuit has steadily loosened the rules governing patentability, allowing ever more patents over a greater range of inventions. This Article argues that both of these modern trends may be attributable in whole or in part to the asymmetric institutional relationship between the PTO and the Federal Circuit. If a patent applicant is denied a patent by the PTO, she can appeal that denial to the Federal Circuit. However, if the PTO grants the patent, no other party has the right to appeal. Accordingly, the PTO can avoid appeals and reversals, both of which are costly in monetary and reputational terms, simply by granting any patent that the Federal Circuit might plausibly allow. Because the PTO will grant nearly any plausible patent, the vast majority of rejected applications that are appealed to the Federal Circuit will concern boundary-pushing inventions that are unpatentable under current law. Occasionally, a particularly patent-friendly panel of Federal Circuit judges will elect to reverse the PTO and grant a patent that the Agency has denied. The Federal Circuit's decision will create a new, inflationary precedent. The boundaries of patentability will expand slightly, as this new precedent exerts influence on the other circuit judges. And as the Federal Circuit's conception of what may be patented expands, the PTO will similarly inflate its own standards in order to maintain an adequate margin for error and avoid denying a patent that the Federal Circuit is likely to grant on appeal. Patent law will thus be subject to a natural inflationary pressure.

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INTRODUCTION

The shape of patent law is defined in large degree by the interaction between two institutions: the Court of Appeals for the Federal Circuit and the Patent and Trademark Office (PTO). Intervention from Congress or the Supreme Court comes rarely—Congress went nearly sixty years without significantly altering substantive patent law,¹ and until very recently the Supreme Court has generally been reluctant to weigh in on many of the most important patent questions.² In their absence, the Federal Circuit and the PTO have arrived at an institutional *détente*. The Federal Circuit dictates the rules of substantive patent law to the Patent Office via interpretations of the Patent Act.³ The PTO then grants or denies patents according to those rules.⁴

Yet this structural accord has not well served the patent system or the private parties who rely on it. In recent years both the PTO and the Federal Circuit have received trenchant criticism for their handling (and mishandling) of patent applications and patent cases. Critics have leveled two particular

1. In 2011, Congress passed and the President signed the America Invents Act, Pub. L. No. 112-29, § 10(a)(1), 125 Stat. 284, 316(2011) (to be codified in scattered sections of 35 U.S.C.), the first significant change to substantive patent law since 1952. In 1994, Congress altered the patent term in order to comply with the Uruguay Agreements, but these changes did not otherwise affect the substantive content of the law. *See, e.g.*, Uruguay Round Agreements Act, Pub. L. No. 103-465, § 532(a), 108 Stat. 4809, 4983 (1994) (codified as amended at 35 U.S.C. § 154(a)(2) (2006)).
2. The Supreme Court has expressed an “increased interest in patent cases” in recent years. *See* Timothy B. Dyk, *Foreword: Does the Supreme Court Still Matter?*, 57 AM. U. L. REV. 763, 764 (2008). However, for most of the two-decade period since the Federal Circuit was formed, the Supreme Court has devoted “barely enough attention to exert any real influence on patent jurisprudence.” Rochelle Cooper Dreyfuss, *In Search of an Institutional Identity: The Federal Circuit Comes of Age*, 23 BERKELEY TECH. L.J. 787, 806-07 (2008).
3. *See* 28 U.S.C. § 1295(a) (granting the Federal Circuit exclusive jurisdiction over appeals from district courts and the PTO arising under the Patent Act); *cf.* Act of July 19, 1952, ch. 950, 66 Stat. 792 (codified as amended at 35 U.S.C. §§ 1-293) [hereinafter “the Patent Act”].
4. *See* Koninklijke Philips Elec. N.V. v. Cardiac Sci. Operating Co., 590 F.3d 1326, 1337 (Fed. Cir. 2010) (“We remind the district court and the [Board of Patent Appeals and Interferences] that they must follow judicial precedent”); Megan E. Lyman, *Judicial Fitness for Review of Complex Biotechnology Issues in Patent Litigation: Technical Claim Interpretation*, 23 J. NAT’L ASS’N ADMIN. L. JUDGES 503, 509 (2003) (“The PTO is bound by the decisions handed down by the Federal Circuit and the Supreme Court.”); Craig Allen Nard, *Deference, Defiance, and the Useful Arts*, 56 OHIO ST. L.J. 1415, 1420-21 (1995) (explaining the legal relationship between the PTO and Federal Circuit).

charges: first, that the PTO grants too many invalid patents;⁵ and second, that the Federal Circuit has steadily loosened the legal rules governing patentability, allowing applicants to obtain patents on an ever wider variety of inventions.⁶ The first criticism is all the more remarkable in light of the second. Despite the fact that the Federal Circuit has noticeably expanded the boundaries of what may be patented over the past decades, the PTO continues to grant significant numbers of patents that are invalid under governing Federal Circuit law.

Scholars have attributed the patent system's joint dysfunctions – an excess of invalid patents and overly permissive rules of patentability – to a number of potential causes. These include funding shortfalls at the PTO; internal management problems at the PTO; a lack of expertise at the PTO or the Federal Circuit; capture by private interests; and, perhaps most importantly, a simple ideological preference for greater numbers of patents across a broader range of technologies.⁷ Nonetheless, there remains sharp disagreement regarding the likely causes of these systemic problems and their proper solutions. Indeed, a variety of correctives have been proposed and implemented, to little avail.⁸

This Article intends to offer a different explanation for the problems plaguing the patent system. The permissive nature of the PTO and the inflationary tendencies of the Federal Circuit might instead be due to the contorted institutional relationship that exists between the two organizations.

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5. See, e.g., ADAM B. JAFFE & JOSH LERNER, *INNOVATION AND ITS DISCONTENTS* 34-35 (2004); Michael A. Heller & Rebecca S. Eisenberg, *Can Patents Deter Innovation? The Anticommons in Biomedical Research*, 280 *SCI.* 698 (1998) (analyzing the negative effects of a crowded patent field on innovation and market entrance); Mark A. Lemley, *Rational Ignorance at the Patent Office*, 95 *NW. U. L. REV.* 1495, 1495 n.1 (2001); Doug Lichtman & Mark A. Lemley, *Rethinking Patent Law's Presumption of Validity*, 60 *STAN. L. REV.* 45, 47 n.5 (2007); Robert P. Merges, *As Many as Six Impossible Patents Before Breakfast: Property Rights for Business Concepts and Patent System Reform*, 14 *BERKELEY TECH. L.J.* 577, 589-91 (1999); Michael J. Meurer, *Patent Examination Priorities*, 51 *WM. & MARY L. REV.* 675, 676 (2009) (“[T]he PTO struggles to improve examination quality.”); Mark Lemley, Doug Lichtman & Bhaven Sampat, *What To Do About Bad Patents?*, *REG.*, Winter 2005-2006, at 10, 10-13 (noting that “countless patents that seem reasonable to a lay audience overreach in technical fields” and describing in particular the problems generated by economically significant invalid patents).
 6. See, e.g., FTC, *TO PROMOTE INNOVATION* 14 (2003), <http://www.ftc.gov/os/2003/10/innovationrpt.pdf>; JAFFE & LERNER, *supra* note 5, at 115-19; Jay Dratler, Jr., *Alice in Wonderland Meets the U.S. Patent System*, 38 *AKRON L. REV.* 299, 304 (2005). Here and throughout the text, I use the word “patentability” to describe all of the doctrines governing whether an invention is patentable. This includes whether the invention recites patentable subject matter, 35 U.S.C. § 101, whether the invention is novel, 35 U.S.C. § 102, and whether it is nonobvious, 35 U.S.C. § 103, among other requirements.
 7. See *infra* notes 30-35 and accompanying text.
 8. See *infra* Part I.

Because of the manner in which patent cases make their way from the PTO to the Federal Circuit, the PTO has a decided institutional interest in granting more patents than it should. And because of this same interaction, the Federal Circuit is engaged in an unwitting expansion of the patentability rules.

The key lies with the asymmetric nature of appeals from the PTO to the Federal Circuit. When the PTO denies a patent application, the aggrieved applicant may appeal to the Federal Circuit.⁹ When the PTO grants a patent, however, there is no losing party to appeal—the victorious applicant merely walks away with its patent.¹⁰ That patent is unlikely ever to see the inside of a courtroom, given how few infringement lawsuits are litigated.¹¹ Like most administrative agencies, the PTO wishes to avoid appeals and especially reversals.¹² In order for the Agency to accomplish this, it need only err on the side of granting excessive numbers of patents—even invalid patents—for which there is no appeal. This desire to avoid litigation is a source of the invalid patents now being issued by the PTO in vast numbers—the patent system’s first problem.

The second problem, the ongoing expansion of the rules governing what types of inventions may be patented, stems from the PTO’s proclivity to grant any plausible patent. Because of the PTO’s efforts, the patent applications that the Agency denies will predominantly concern inventions that are unpatentable under current law.¹³ When a disappointed patent applicant appeals such an application to the Federal Circuit, that court has two options. It can reject the patent under existing law, preserving the law as it stands, or it can grant the patent under a new, more expansive understanding of what is patentable. The circuit denies most of these applications.¹⁴ But when the Federal Circuit

9. 35 U.S.C. § 141.

10. While no Code provision affirmatively states that no party may appeal when a patent is granted, this inference may be deduced from the fact that the only Code provision that mentions or allows appeal only speaks of “applicant[s]” who are “dissatisfied” with the decision of the Board of Patent Appeals and Interferences (BPAI). *See id.*

11. In addition, those patents that are eventually litigated in the context of a suit for infringement will likely have neutral effects on the patent law trends described here. I discuss the issue of infringed patents in detail *infra* Subsection II.D.5.

12. *See infra* Subsection II.D.1.

13. Although the PTO could avoid appeals entirely simply by granting every patent, there are countervailing forces that prevent it from doing so. *See infra* notes 110-122 and accompanying text.

14. Since its creation in 1982, the Federal Circuit has reversed the PTO on direct appeal approximately 15% of the time. This figure was calculated based on data taken from Donald R. Dunner, J. Michael Jakes & Jeffrey D. Karceski, *A Statistical Look at the Federal Circuit’s Patent Decisions: 1982-1994*, 5 FED. CIR. B.J. 151, 155 (1995), which found that the Federal

eventually decides a case in favor of an applicant, it creates a new precedent that enlarges the scope of what may be patented. The process then repeats itself, with the PTO denying more boundary-pushing patent applications and the Federal Circuit being presented with further opportunities to expand the limits of patentability. The result is a natural inflationary pressure on the law, generated entirely by the types of cases that the PTO sends to the Federal Circuit.

These effects rely on only three innocuous factors. First, the PTO—through its administrators—pursues its own organizational interests. Second, the Federal Circuit is composed of heterogeneous judges who do not always agree on the proper content of patent law. This means that a patent applicant could draw a favorable Federal Circuit panel and be granted a patent that the median Federal Circuit judge would find invalid. And third, appeal from the PTO is asymmetric. Only an applicant whose patent has been rejected may appeal a PTO decision to the Federal Circuit. Using only these three institutional features of the patent system, this Article builds a model of the interaction between the PTO, Federal Circuit, and patent applicants, which predicts that improperly granted patents will expand the legal boundaries of patentability.¹⁵

This Article thus identifies a novel institutional source for the patent system's problems. The goal is not to demonstrate that the other possible causes of patent inflation—ideology, lack of expertise, and so forth—are incorrect. It is possible that some of these causes are at work alongside the institutional pressures described here. But it is crucial to note that *even if all of these other potential causes were eliminated*, the systemic problems of bad patents and expanding patent law would remain, driven by the institutional relationship between the PTO and Federal Circuit. Accordingly, this Article suggests a legal solution that would directly address these institutional issues at their source.

Circuit “has affirmed the PTO’s determination of unpatentability about 80% of the time,” and the Federal Circuit’s own website, *Statistics*, U.S. COURT OF APPEALS FOR THE FED. CIRCUIT, <http://www.ca9.uscourts.gov/the-court/statistics.html> (last visited Nov. 8, 2011), which provides data for the years 1997–2010. Those data reveal that the Federal Circuit has reversed PTO decisions approximately 11.8% of the time in the past fourteen years. Data for 1995 and 1996 are unavailable.

15. This Article is in the tradition of other works that have posited asymmetric development of the law through selection effects and other mechanisms. See Marc Galanter, *Why the “Haves” Come Out Ahead: Speculations on the Limits of Legal Change*, 9 LAW & SOC’Y REV. 95 (1974); Gillian K. Hadfield, *Bias in the Evolution of Legal Rules*, 80 GEO. L.J. 583 (1992); Daniel Klerman, *Jurisdictional Competition and the Evolution of the Common Law*, 74 U. CHI. L. REV. 1179 (2007).

Finally, the interaction between the PTO and the Federal Circuit is uncommon but by no means unique. Nearly every type of civil litigation or administrative proceeding produces winning and losing parties, either of whom can appeal to the federal courts. This is of course true for standard civil trials, and it is true as well for essentially every federal administrative action, from promulgating major regulations¹⁶ to individual funding¹⁷ or permitting decisions.¹⁸ Yet asymmetric systems of review exist in several important areas of federal benefits law (such as Social Security Disability benefits),¹⁹ immigration law,²⁰ tax law,²¹ and—most importantly—jury verdicts in criminal law.²² Indeed, even systematically different rates of appeal by civil litigants—for instance, perhaps tort defendants appeal adverse judgments more frequently than tort plaintiffs—can give rise to meaningful (though more muted) asymmetries in appellate review.²³ It is worth noting, however, that most of these other areas of law involve only the adjudication of private rights against the government. A Social Security claimant (or a criminal defendant) acquires no rights against other private actors. By contrast, the PTO and the Federal Circuit are in the business of granting patents that may then be asserted against third parties who were never involved in the proceedings. Patent law thus offers applicants a nearly unique opportunity to capitalize on institutional asymmetries to the detriment of outside actors.

16. *E.g.*, *Chevron U.S.A. Inc. v. Natural Res. Def. Council, Inc.*, 467 U.S. 837, 837 (1984) (challenging an EPA regulation creating a “bubble rule” for new sources of pollution).
17. *E.g.*, *Citizens To Preserve Overton Park, Inc. v. Volpe*, 401 U.S. 402, 419-20 (1971) (blocking the Secretary of Transportation from releasing highway construction funds).
18. *E.g.*, *Carolina Env'tl. Study Grp. v. United States*, 510 F.2d 796, 797 (D.C. Cir. 1975) (challenging an Atomic Energy Commission order granting permission to construct two new nuclear reactors).
19. *See* 42 U.S.C. § 405 (2006) (procedural rules for Supplemental Security Income/Social Security Disability Income claims). Other governmental benefits programs such as tax adjudications also involve asymmetric appeal rights.
20. *See* 8 U.S.C. § 1252(a)(1); 28 U.S.C. § 2344; John W. Guendelsberger, *Judicial Deference to Agency Decisions in Removal Proceedings in Light of INS v. Ventura*, 18 GEO. IMMIGR. L.J. 605, 616 (2005).
21. *See* LEANDRA LEDERMAN & STEPHEN W. MAZZA, *TAX CONTROVERSIES: PRACTICE AND PROCEDURE* 8 (3d ed. 2009).
22. *See* *Sanabria v. United States*, 437 U.S. 54, 75 (1978) (“The short answer to this question is that there is no exception permitting retrial once the defendant has been acquitted”); Kate Stith, *The Risk of Legal Error in Criminal Cases: Some Consequences of the Asymmetry in the Right To Appeal*, 57 U. CHI. L. REV. 1, 26-27 (1990) (arguing that asymmetry in criminal appeals will deceive judges as to the characteristics of a “typical” case).
23. I thank Omri Ben-Shahar for suggesting this point.

This Article proceeds in three parts. Part I briefly describes the complaints that scholars and stakeholders have registered against the Patent and Trademark Office, the Federal Circuit, and the patents (and patent law) that they have jointly produced. Part II explains and analyzes the interaction between the PTO and the Federal Circuit, beginning with a simple model and building toward a more nuanced description that incorporates the characteristics and motivations of the individuals in charge of those institutions. It also describes the roles of other actors within the patent system, offers an important testable prediction, and proposes a remedy to patent law's institutional maladies. Part III presents a case study of the relationship between the PTO and the Federal Circuit concerning the evolving rules that undergird the patentability of intangible processes, an evolution that culminated in the Supreme Court's recent decision in *Bilski v. Kappos*.²⁴ Part III shows how the forces described in Part II have effectively broadened the rules governing the patenting of software, business methods, and related inventions.

I. PATENT PROBLEMS

There is by now a broad consensus that the United States patent system is rife with flaws and inadequacies.²⁵ The "patent crisis," as more than one commentator has termed it,²⁶ has become so severe that in many cases patents are now believed to retard innovation more than they promote it.²⁷ Critics of the patent system have pointed to two particular problems. First, the PTO does a poor job of examining patents, allowing significant numbers of invalid patents to issue.²⁸ Second, the Federal Circuit has pushed the law in an

24. 130 S. Ct. 3218 (2010).

25. See, e.g., JAMES BESSEN & MICHAEL J. MEURER, *PATENT FAILURE: HOW JUDGES, BUREAUCRATS, AND LAWYERS PUT INNOVATORS AT RISK* (2008); DAN L. BURK & MARK A. LEMLEY, *THE PATENT CRISIS AND HOW THE COURTS CAN SOLVE IT* (2009); JAFFE & LERNER, *supra* note 5.

26. See, e.g., BURK & LEMLEY, *supra* note 25 (starting from the premise that a crisis exists within the patent system); NAT'L ACAD. OF SCI., *A PATENT SYSTEM FOR THE 21ST CENTURY* (2004) (same); Peter S. Menell, *The Property Rights Movement's Embrace of Intellectual Property: True Love or Doomed Relationship?*, 34 *ECOLOGY L.Q.* 713, 737 (2007) (describing "a growing patent crisis"); Beth Simone Noveck, "Peer to Patent": *Collective Intelligence, Open Review, and Patent Reform*, 20 *HARV. J.L. & TECH.* 123, 123 (2006) (describing a patent crisis in high-technology fields).

27. See BESSEN & MEURER, *supra* note 25, at 124 (arguing that biotechnology is the *only* field in which patents increase innovation).

28. See *supra* note 5 and accompanying text.

excessively pro-patent direction, broadening the scope of patentable subject matter and endowing patentees with unwarranted power.²⁹

Critics have ascribed these failures to a wide range of causes. Some have pointed to the PTO's lack of funding, which forces the Agency to spend relatively little time scrutinizing each patent.³⁰ Others have argued that the PTO is hamstrung by poor management.³¹ These management problems include the fact that the PTO's salary and bonus system is structured in such a way as to incentivize examiners to grant rather than deny patents.³² Some scholars have placed blame on the fact that both the PTO and the Federal Circuit appear to lack genuine expertise in the technologies involved in modern patents.³³ Others allege that the PTO and the Federal Circuit have been

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29. See *supra* note 6 and accompanying text.
 30. See, e.g., JAFFE & LERNER, *supra* note 5, at 130-33; Rochelle Dreyfuss, *Pathological Patenting: The PTO as Cause or Cure*, 104 MICH. L. REV. 1559, 1567 (2006) (reviewing JAFFE & LERNER, *supra* note 5) ("Fee diversion has impoverished the PTO, making it difficult for the Office to search or examine prior art comprehensively."); Lemley, *supra* note 5, at 1508-11 (noting the negative effects of funding shortages); Lichtman & Lemley, *supra* note 5, at 53 (noting the short amount of time the PTO spends scrutinizing each patent); Arti K. Rai, *Growing Pains in the Administrative State: The Patent Office's Troubled Quest for Managerial Control*, 157 U. PA. L. REV. 2051, 2062-63 (2009).
 31. E.g., JAFFE & LERNER, *supra* note 5, at 133-38; Michael Abramowicz & John F. Duffy, *Ending the Patenting Monopoly*, 157 U. PA. L. REV. 1541, 1554 (2009) (noting the well-known tensions between patent examiners and PTO management); Rai, *supra* note 30, at 2063-64.
 32. Examiners receive bonuses based on how many applications they can process fully. The quickest and easiest way for them to finish processing an application is to grant the patent. JAFFE & LERNER, *supra* note 5, at 136; cf. John Bronsteen, *Against Summary Judgment*, 75 GEO. WASH. L. REV. 522, 540-41 (2007) (noting that judges' preferences for leisure time will incline them to grant more motions for summary judgment than would otherwise be appropriate). One suggestive study found that patent approval rates spike in September—the month in which the PTO's accounting year closes and examiners are awarded bonuses for processed applications. Gajan Retnasaba, *Why It Is Easier To Get a Patent in September?* (May 23, 2008) (unpublished manuscript), http://www.ssrn.com/abstract_id=1121132.
 33. See, e.g., ROBERT PATRICK MERGES & JOHN FITZGERALD DUFFY, *PATENT LAW AND POLICY: CASES AND MATERIALS* 299-327 (4th ed. 2007) (describing the Federal Circuit's struggles with the written description requirement); Dreyfuss, *supra* note 30, at 1577 (noting that the PTO does not have economists and other experts on staff); Mark D. Janis, *On Courts Herding Cats: Contending with the "Written Description" Requirement (and Other Unruly Patent Disclosure Doctrines)*, 2 WASH. U. J.L. & POL'Y 55, 62-69 (2000) (describing the Federal Circuit's struggles with the written description requirement); R. Polk Wagner & Lee Petherbridge, *Is the Federal Circuit Succeeding? An Empirical Assessment of Judicial Performance*, 152 U. PA. L. REV. 1105 (2004) (finding that the Federal Circuit has been only mildly successful in promulgating a coherent and predictable doctrine of claim construction).

captured by private, pro-patent interests.³⁴ Finally, and perhaps most importantly, some observers believe that the Federal Circuit simply holds an ever-increasing ideological preference for greater numbers of patents over a broader range of technologies.³⁵

Regardless of the exact cause, invalid patents and permissive, pro-patent rules have imposed undeniable costs on inventors and consumers alike. Invalid, improperly granted patents can dissuade potential competitors from entering a market and stunt investment in further research.³⁶ They raise search costs for firms that must scrutinize the intellectual property that exists in a given field and investigate those patents' validity, lest a competitor later force them out of the market.³⁷ Invalid patents can also hamper a firm's ability to raise capital³⁸ or

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34. See, e.g., BURK & LEMLEY, *supra* note 25, at 106-07 (arguing that the PTO is subject to capture); Dreyfuss, *supra* note 30, at 1567; Clarisa Long, *The PTO and the Market for Influence in Patent Law*, 157 U. PA. L. REV. 1965, 1967 (2009) (suggesting that the PTO has invited capture in order to increase its own stature); Meurer, *supra* note 5, at 699 (suggesting the influence that repeat players can have on PTO behavior); John R. Thomas, *Formalism at the Federal Circuit*, 52 AM. U. L. REV. 771, 792-94 (2003) (suggesting that the Federal Circuit has been captured); R. Polk Wagner, *Understanding Patent-Quality Mechanisms*, 157 U. PA. L. REV. 2135, 2153 (2009). *But see* John M. Golden, *The Supreme Court as "Prime Percolator": A Prescription for Appellate Review of Questions in Patent Law*, 56 UCLA L. REV. 657, 685-86 (2009) (dismissing arguments that the Federal Circuit has been captured).
35. E.g., BESSEN & MEURER, *supra* note 25, at 69 (suggesting that the Federal Circuit has been "pro-patent"); JAFFE & LERNER, *supra* note 5, at 115-19; WILLIAM M. LANDES & RICHARD A. POSNER, *THE ECONOMIC STRUCTURE OF INTELLECTUAL PROPERTY LAW* 335 (2003) (arguing that "[t]he Federal Circuit has indeed turned out to be a pro-patent court").
36. See Heller & Eisenberg, *supra* note 5, at 698; Christopher R. Leslie, *The Anticompetitive Effects of Unenforced Invalid Patents*, 91 MINN. L. REV. 101, 113-27 (2006); Suzanne Schotchmer, *Standing on the Shoulders of Giants: Cumulative Research and the Patent Law*, 5 J. ECON. PERSPECTIVES 29, 32 (1991) (noting that overbroad patent protection for the first mover in a market "can lead to deficient incentives to develop second generation products").
37. See, e.g., MERGES & DUFFY, *supra* note 33, at 615-16 (describing the economics of search costs); Ian Ayres & Gideon Parchomovsky, *Tradable Patent Rights*, 60 STAN. L. REV. 863, 869-76 (2007); Clarisa Long, *Proprietary Rights and Why Initial Allocations Matter*, 49 EMORY L.J. 823, 828 (2000) ("The search costs of patent licensing should not be underestimated."); Jonathan S. Masur, *Patent Liability Rules as Search Rules*, 78 U. CHI. L. REV. 187 (2011) (describing the impact of contributory liability rules on market entrance and search responsibilities); Roger Cheng, *ITC Says HTC Violating Two of Apple's Patents*, CNET (July 15, 2011), http://news.cnet.com/8301-1035_3-20079905-94/itc-says-htc-violatingtwo-of-apples-patents.
38. See FTC, *supra* note 6, ch. 2, at 8 ("The threat of being sued for infringement by an incumbent [patent holder] – even on a meritless claim – may scare . . . away venture capital financing." (internal quotation marks omitted)).

write contracts with potential customers.³⁹ Financial markets will be wary of firms that may not be sustainable because they traffic in infringing products. Customers will hesitate before forming business relationships that may expose them to suits for contributory infringement and will resist relying upon suppliers who may be shut down or driven out of the market by a lawsuit.⁴⁰ Invalid patents raise licensing and litigation costs.⁴¹ And once granted, they are difficult to eliminate: granted patents are presumed valid and can only be invalidated in court upon a showing of clear and convincing evidence.⁴²

More broadly speaking, patents “involve[] a fundamental tradeoff between dynamic and static efficiency: patents spur innovation but only at the cost” of higher prices for current consumers.⁴³ If too many patents are granted on too many inventions, or if the courts allow patents to become too powerful, the balance could tilt against patents as socially useful devices. If patents no longer provided a significant incentive for innovation, they might not be worth the costs that they impose upon consumers.⁴⁴

In response to the inadequacies of the Patent Office and the Federal Circuit, as well as the costs of bad patents, scholars have advanced a number of proposals for reform. Some have argued that the PTO should receive additional funding, enabling it to hire more and better examiners.⁴⁵ Others

39. Leslie, *supra* note 36, at 125-27.

40. See Joseph Borkin, *The Patent Infringement Suit—Ordeal by Trial*, 17 U. CHI. L. REV. 634, 641 (1950) (“Contributory infringement . . . can serve as an effective side-attack to cut off the economic support of a small producer.”).

41. See Bresnick v. U.S. Vitamin Corp., 139 F.2d 239, 242 (2d Cir. 1943) (describing a patent as a “scarecrow” that can deter competition by its very existence); Michael J. Meurer, *Controlling Opportunistic and Anti-Competitive Intellectual Property Litigation*, 44 B.C. L. REV. 509, 515 (2003).

42. *Spansion, Inc. v. Int’l Trade Comm’n*, 629 F.3d 1331, 1344 (Fed. Cir. 2010).

43. Ayres & Parchomovsky, *supra* note 37, at 867; see also DONALD S. CHISUM ET AL., PRINCIPLES OF PATENT LAW 6 (1998); MERGES & DUFFY, *supra* note 33, at 253-56 (describing the incentive systems meant to drive patent law); Michael Abramowicz, *The Uneasy Case for Patent Races over Auctions*, 60 STAN. L. REV. 803, 809-10 (2007) (“This trade-off between static and dynamic efficiency is familiar to patent scholarship”); Joseph A. Franco, Note, *Limiting the Anticompetitive Prerogative of Patent Owners: Predatory Standards in Patent Licensing*, 92 YALE L.J. 831, 836 (1983) (“The patent system that Congress created reflects a tradeoff between dynamic and static efficiency.”).

44. Gideon Parchomovsky & Peter Siegelman, *Towards an Integrated Theory of Intellectual Property*, 88 VA. L. REV. 1455, 1504-08 (2002) (suggesting the limits at which the losses due to static inefficiency outweigh the gains in dynamic efficiency).

45. See, e.g., America Invents Act, H.R. 1249, 112th Cong. § 22 (2011) (enacted) (ending fee diversion for the PTO); America Invents Act, S. 23, 112th Cong. § 20(c) (2011) (also proposing to end fee diversion for the PTO); 154 CONG. REC. S9982-93 (daily ed. Sept. 27,

have suggested that patent examinations should be eliminated altogether, with patent examination reverting to a simple system of registration akin to the copyright regime.⁴⁶ Still others have argued that the problems should be left to the federal courts to sort out.⁴⁷

Many of these proposals have been coupled with suggestions for meaningful inter partes post-grant administrative review, a mechanism by which potential infringers can challenge a patent's validity without undertaking expensive litigation in federal courts.⁴⁸ A system of inter partes review already exists, but it imposes such disadvantages on third-party challengers that it is almost never used.⁴⁹ Some scholars recommend a multi-tiered system of patent review in which applicants can opt for one of several levels of PTO scrutiny with correspondingly strong ex post presumptions of

2008) (statement of Sen. Jon Kyl) ("Fee diversion unquestionably has a negative impact on the patent system. In recent years, it has hampered PTO's ability to hire an adequate number of examiners."); JAFFE & LERNER, *supra* note 5, at 179-91 (proposing that the PTO expend greater funds on more rigorous examination); John R. Allison & Starling D. Hunter, *On the Feasibility of Improving Patent Quality One Technology at a Time: The Case of Business Methods*, 21 BERKELEY TECH. L.J. 729, 734 (2006); Paul R. Michel & Henry R. Nothhaft, Op-Ed, *Inventing Our Way Out of Joblessness*, N.Y. TIMES, Aug. 5, 2010, <http://www.nytimes.com/2010/08/06/opinion/06nothhaft.html>.

46. F. Scott Kieff, *The Case for Registering Patents and the Law and Economics of Present Patent-Obtaining Rules*, 45 B.C. L. REV. 55 (2003); Adam Mossoff, *Who Cares What Thomas Jefferson Thought About Patents? Reevaluating the Patent "Privilege" in Historical Context*, 92 CORNELL L. REV. 953, 999, 1009 (2007) (noting that the early Patent Office used what amounted in practice to a registration system for patents and suggesting that this history is relevant to modern patent policy debates).
47. BURK & LEMLEY, *supra* note 25, at 104-07; Lemley, *supra* note 5, at 1511 (arguing that further investment in patent scrutiny, because it must be spread across hundreds of thousands of patents per year, would result in little gain in the quality of issued patents).
48. See, e.g., JAFFE & LERNER, *supra* note 5, at 184-86; Joseph Farrell & Robert P. Merges, *Incentives To Challenge and Defend Patents: Why Litigation Won't Reliably Fix Patent Office Errors and Why Administrative Patent Review Might Help*, 19 BERKELEY TECH. L.J. 943 (2004).
49. In 2010 there were 224 actions for inter partes review, an all-time high. However, 196 of them were related to already pending litigation, meaning that there were only 28 distinct inter partes review cases. U.S. PATENT & TRADEMARK OFFICE, PERFORMANCE AND ACCOUNTABILITY REPORT: FISCAL YEAR 2010, at 137 tbl.13B (2010), available at <http://www.uspto.gov/about/stratplan/ar/2010/USPTOFY2010PAR.pdf>. This was during a year in which the PTO issued 233,127 patents. *Id.* at 129 tbl.6. One principal reason that so few parties used inter partes review was that a challenger in an inter partes proceeding is estopped from further litigation of any issue that it raised or could have raised during the inter partes action. 35 U.S.C. § 315(c) (2006). This is too great a sacrifice for parties that might later want to litigate in federal court. The America Invents Act, Pub. L. No. 112-29, 125 Stat. 284 (2011), makes a number of important changes to these inter partes proceedings but includes the same estoppel provisions and thus is unlikely to be used much more widely. *Id.* at § 325(e), 125 Stat. at 308.

validity.⁵⁰ And even more exotic proposals abound, including suggestions for tradable patent rights that would limit the number of patents in force at any given time,⁵¹ or even private competition in the market for patent examination.⁵² Finally, some commentators have begun to suggest abolishing the Federal Circuit entirely and returning to the prior system of jurisdictional competition between the generalist courts of appeal.⁵³

Finding the correct solution depends, of course, on correctly diagnosing the problem. It is possible that some or all of the factors described above—funding, management, lack of expertise, capture, and ideology⁵⁴—have contributed to the proliferation of invalid patents and the unflagging expansion of patent rights. Nonetheless, this Article aims to demonstrate that the patent system's failings can be explained instead as a consequence of the contorted institutional relationship between the PTO and the Federal Circuit.

II. PATENT EXPANSION

This Part presents a model of the interaction between three principal actors: the Federal Circuit, the PTO, and a patent applicant. The basic model proceeds in four stages. First, the patent applicant applies to the PTO for a patent. Second, the PTO decides whether to grant the patent. Officially, the PTO is an agent of the Federal Circuit; its role is to grant only those patents that the Federal Circuit would allow under governing law.⁵⁵ Third, if the PTO denies the patent, the applicant decides whether to appeal that denial to the Federal Circuit.⁵⁶ And fourth, the Federal Circuit decides the appeal (if there is one).

50. See, e.g., Lemley et al., *supra* note 5, at 12-13; Kristen Osenga, *Entrance Ramps, Tolls, and Express Lanes—Proposals for Decreasing Traffic Congestion in the Patent Office*, 33 FLA. ST. U. L. REV. 119, 141-51 (2005).

51. Ayres & Parchomovsky, *supra* note 37, at 870.

52. Abramowicz & Duffy, *supra* note 31, at 1576 (suggesting that private patent examination firms be allowed to compete with the PTO).

53. E.g., Dreyfuss, *supra* note 2, at 804 (“Another idea would be to abolish the Federal Circuit and reconstitute it as a trial court.”); Arti K. Rai, *Engaging Facts and Policy: A Multi-Institutional Approach to Patent System Reform*, 103 COLUM. L. REV. 1035, 1102 (2003) (“I discuss whether the best solution would involve abolishing the Federal Circuit, and having a system of specialized trial courts reviewed by generalist appellate courts.”).

54. See *supra* notes 30-35 and accompanying text.

55. See *supra* note 4.

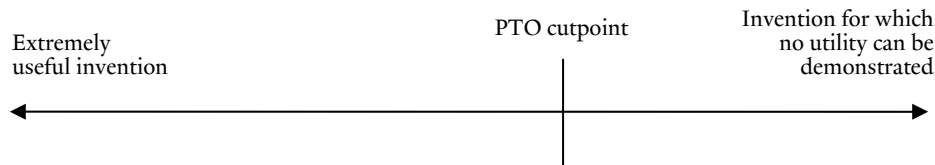
56. To be precise, inventors whose patents were rejected by the PTO examiner may appeal to the Board of Patent Appeals and Interferences (BPAI), an administrative court located

Following attitudinal models of judging, which describe judges as having an “ideal point”⁵⁷ – the point along a continuum of possible outcomes where they would prefer the law to land – the model describes Federal Circuit judges as having an “ideal point” regarding patentability.⁵⁸ That is, along any given dimension of patentability (novelty, enablement, etc.), each judge, were she left to her own devices, would draw a line at a given point and allow patents up to that point and no further. This ideal point is better described as a “cutpoint,” in the sense that it represents the cutoff between patentability and nonpatentability.⁵⁹ This notion of cutpoints is not limited to the Federal Circuit; the PTO has cutpoints along any given dimension as well. These cutpoints can be represented graphically. For instance, Figure 1 displays a hypothetical PTO cutpoint on the issue of utility:

within the PTO. See 35 U.S.C. § 6(b) (2006) (“The Board of Patent Appeals and Interferences shall, on written appeal of an applicant, review adverse decisions of examiners upon applications for patents”); John F. Duffy, *Are Administrative Patent Judges Unconstitutional?*, 77 GEO. WASH. L. REV. 904, 907-08 (2009). (The America Invents Act renames the BPAI as the Patent Trial and Appeal Board (PTAB), America Invents Act, Pub. L. No. 112-29, § 135(j), 125 Stat. 284, 290 (2011), but for simplicity I will continue to refer to it as the BPAI.) Applicants who do not like the result before the BPAI can then appeal to the Federal Circuit. As later sections will explain, however, the BPAI is substantially influenced by the top PTO administrators. See *infra* note 106. Because these administrators control all significant decisionmakers within the agency, and in the interest of simplicity, I will refer to the PTO as if it were a unitary actor, rather than distinguishing between examiners and the BPAI.

57. E.g., GLENDON SCHUBERT, *THE JUDICIAL MIND: THE ATTITUDES AND IDEOLOGIES OF SUPREME COURT JUSTICES 1946-1963*, at 220 (1965); see also Jeffrey A. Segal & Albert D. Cover, *Ideological Values and the Votes of U.S. Supreme Court Justices*, 83 AM. POL. SCI. REV. 557 (1989) (quantifying Justices’ ideological preferences).
58. See Nicola Gennaioli & Andrei Shleifer, *Judicial Fact Discretion*, 37 J. LEGAL STUD. 1, 18-20 (2008) (employing an ideal point-based model); Pauline T. Kim, *Deliberation and Strategy on the United States Courts of Appeals: An Empirical Exploration of Panel Effects*, 157 U. PA. L. REV. 1319, 1347 (2009) (employing an ideal point model of judging); Alexander Volokh, *Choosing Interpretive Methods: A Positive Theory of Judges and Everyone Else*, 83 N.Y.U. L. REV. 769, 780-82 (2008) (explaining the use of ideal points in decision models).
59. See Lee Epstein et al., *Ideological Drift Among Supreme Court Justices: Who, When, and How Important?*, 101 NW. U. L. REV. 1483, 1529-30 (2007) (describing the lines demarcating decisions between voting one way or the other on a case as cutpoints); Keith Krehbiel, *Committee Power, Leadership, and the Median Voter: Evidence from the Smoking Ban*, 12 J.L. ECON. & ORG. 234, 252 (1996) (employing a cutpoint-based model).

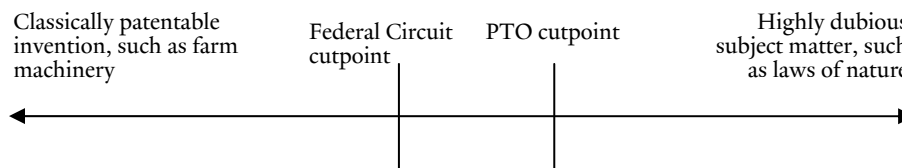
Figure 1.
THE PTO CUTPOINT ON UTILITY



One can imagine the universe of possible inventions arrayed on the line from left to right in order of decreasing utility: on the far left are inventions that are obviously and incontrovertibly useful; on the far right are inventions with no demonstrated utility. The PTO will grant patents on inventions that fall to the *left* of its cutpoint and deny patents on inventions that fall to the *right* of its cutpoint. The further to the right an actor's cutpoint is located, the more patents that actor would grant—and thus the more lenient are that actor's standards for patentability.

There are, of course, many different dimensions to patentability. Among other things, a patent must recite valid subject matter,⁶⁰ and it must be novel,⁶¹ nonobvious,⁶² and useful.⁶³ Each actor—the Patent and Trademark Office, and each judge of the Federal Circuit—has a cutpoint for each of these issues. In addition, the Federal Circuit more generally has a cutpoint that represents the patents it would grant under its own governing precedent. For instance, the Federal Circuit and the PTO might have the following cutpoints on the issue of patentable subject matter:

Figure 2.
PTO AND FEDERAL CIRCUIT CUTPOINTS ON PATENTABLE SUBJECT MATTER



60. *E.g.*, *Diamond v. Chakrabarty*, 447 U.S. 303 (1980) (patentability of living organism).

61. *E.g.*, *In re Robertson*, 169 F.3d 743 (Fed. Cir. 1999) (novelty).

62. *E.g.*, *KSR Int'l Co. v. Teleflex Inc.*, 550 U.S. 398 (2007) (obviousness).

63. *E.g.*, *Brenner v. Manson*, 383 U.S. 519 (1966) (doctrine of specific utility); *In re Brana*, 51 F.3d 1560 (Fed. Cir. 1995) (same).

In this example, the PTO is more permissive than the Federal Circuit, as represented by the fact that its cutpoint is to the right of the Federal Circuit's.

Two final notes are in order. First, the analysis that follows begins with the simplest case: a completely error-free PTO and a completely error-free Federal Circuit, both of which grant all patents to the left of their cutpoints and deny all patents to the right of their cutpoints. This is obviously unrealistic; no court or agency can be perfectly accurate in all circumstances. Any actor will occasionally grant patents that are to the right of its cutpoint or deny patents that are to the left of its cutpoint, purely as a matter of error or internal institutional disagreements.⁶⁴ The simple case is used merely to establish the basic building blocks of the model. Later sections drop the assumption of perfect accuracy and present a more realistic picture of the interaction between the PTO and the Federal Circuit.

Second, the analysis proceeds as if there were only one dimension to patentability, and it often speaks of “patentability” as a placeholder for any of the various doctrines—patentable subject matter,⁶⁵ novelty,⁶⁶ enablement,⁶⁷ utility,⁶⁸ and so forth—that determine whether an application is patentable. Nonetheless, it is entirely generalizable to any number of dimensions—what is true for one dimension should be true for all of them. The theory that follows is indeed meant to apply to all doctrines related to whether an invention is patentable.

A. Error-Free PTO and Federal Circuit

Consider first an error-free PTO, an error-free and entirely homogenous Federal Circuit, and a strategic patent applicant. The Federal Circuit will set the appropriate limits of patentability, and the PTO will follow those limits to the letter. Under these circumstances, the PTO will grant only those patents that are genuinely patentable under governing Federal Circuit law, and because the PTO makes no errors, the Federal Circuit will uphold its decision if any aggrieved patentee appeals. Accordingly, strategic patentees will only apply for

64. For instance, some judges on the Federal Circuit may be more lenient than others, and an appeal may turn on which panel of three judges is selected to hear it. I discuss this at greater length below. *See infra* notes 78-82.

65. *See* 35 U.S.C. § 101 (2006).

66. *See id.* § 102.

67. *See id.* § 112.

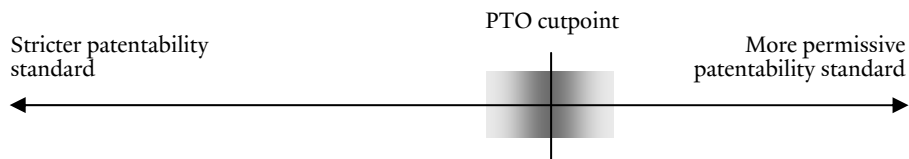
68. *See id.* § 101.

patents on inventions that they know to be patentable. The system will function ideally.

B. Error-Prone or Noisy PTO, Error-Free Federal Circuit

Now imagine that the PTO is not perfect but instead will make random errors when examining patent applications, sometimes granting patents that it should not,⁶⁹ and sometimes denying patents that should be granted.⁷⁰ The errors will cluster around the PTO's cutpoint: the closer an application is to the cutpoint, the more likely the PTO is to err in examining it.⁷¹ In other words, the PTO will be less likely to incorrectly decide patent applications that are obviously patentable or obviously unpatentable. Figure 3 represents this phenomenon graphically. The shaded area represents the set of patent applications that the PTO might decide incorrectly; the darker the shading, the more likely the PTO is to err.

Figure 3.
THE PTO'S CUTPOINT, WITH ERROR RANGES



The PTO thus produces four types of decisions: false negatives (patents it should grant but instead denies); false positives (patents it should deny but instead grants); true negatives (patents it should deny and does); and true positives (patents it should grant and does). The following figure represents these categories graphically:

69. Again, "should" is meant in reference to governing Federal Circuit law. The PTO should grant all patents that are allowable according to the Federal Circuit and should deny all patents that are not.

70. The precise source of the error is not important. One possibility is that these errors could be due to simple mistakes by examiners and the difficulties inherent to accurately examining a patent.

71. This is the standard, intuitive assumption that drives all spatial models. See *supra* notes 57-59.

PATENT INFLATION

Figure 4.
TRUE AND FALSE POSITIVES AND NEGATIVES AT THE PTO

	PTO SHOULD GRANT PATENT	PTO SHOULD DENY PATENT
PTO GRANTS PATENT	True positive	False positive
PTO DENIES PATENT	False negative	True negative

Imagine further that the Federal Circuit is again error-free. When the PTO erroneously denies a patent (a false negative), the aggrieved party can appeal to the Federal Circuit.⁷² The Federal Circuit will then reverse the PTO. But when the Patent Office grants a patent, there is no opposing private party positioned to challenge that patent in court, and thus no opportunity for the Federal Circuit to correct the PTO's error.⁷³ Only PTO actions on one side of the ledger are appealed directly to the federal courts.⁷⁴ Strategic patent applicants will thus understand that there is some chance that the PTO will grant them a patent on an unpatentable invention. Accordingly, patent applicants will file some number of patent applications that they believe to be unpatentable, hoping to get lucky at the PTO. The number of these attempts will depend on the PTO's rate of error and the cost of filing for a patent.⁷⁵

72. This is relatively rare, of course. The far more common course of action is for the private party to file a series of continuation patents with the Patent Office until the examiner finally agrees to grant the patent. Mark A. Lemley & Kimberly A. Moore, *Ending Abuse of Patent Continuations*, 84 B.U. L. REV. 63, 74-75 (2003).

73. The PTO does provide for limited inter partes review of patents, but this procedure is very rarely used because it is costly for the challenging party. *See supra* note 49.

74. That is not to say that improperly granted patents never wind up in federal court. They do, in the context of suits for infringement. Yet they arrive there in smaller numbers—and after greater delay—than patents based on applications denied. I explore this in greater detail *infra* Subsection II.D.5.

75. *See* Jonathan S. Masur, *Costly Screens and Patent Examination*, 2 J. LEGAL ANALYSIS 687, 700 (2010) (cataloguing the costs involved in obtaining a patent).

Under these circumstances, if the costs of appealing to the Federal Circuit are low enough, few patents will be improperly denied: any applicant whose patent is wrongly denied can simply appeal, and the Federal Circuit will grant the patent. However, some number of invalid patents will be improperly granted by the PTO and never appealed. In that respect, this arrangement bears some resemblance to reality—most observers agree that the patent system is rife with improperly granted patents.⁷⁶

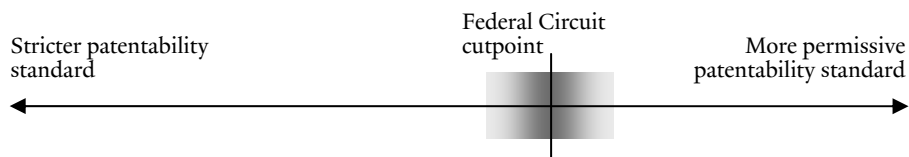
C. Error-Free PTO, Error-Prone or Noisy Federal Circuit

1. Issued Patents

Now imagine that the PTO is error-free—it grants or denies every application precisely in accordance with governing Federal Circuit law. But suppose that the Federal Circuit is error-prone, or that its behavior is “noisy” with respect to its cutpoint. The Federal Circuit will usually deny applications that are to the right of the cutpoint (meaning that the patent would normally be invalid under existing precedent) and approve applications that are to the left of the cutpoint (meaning that the patent would be valid under existing precedent). However, it will occasionally grant invalid patents or deny valid ones. Like the error-prone PTO from the prior section, the Federal Circuit’s errors are clustered around its cutpoint. The more obviously patentable or unpatentable an invention is, the less likely the circuit is to decide the case improperly. Figure 5 represents this graphically:

Figure 5.

THE FEDERAL CIRCUIT’S CUTPOINT, WITH ERROR RANGES



This error or noise could derive from a variety of sources. It might be the result of the technological difficulties inherent in ascertaining the patentability

76. See *supra* note 5.

of an invention; even experienced judges will frequently make legal errors.⁷⁷ Alternatively, what appear to be errors in Federal Circuit patent grants or denials might instead be the result of random panel assignments within the circuit. The cutpoint for the Federal Circuit as a whole is determined by its median judge—the judge who holds the deciding vote in en banc cases.⁷⁸ But other judges may have more or less expansive views of the scope of patentability than the median judge.⁷⁹ In fact, there is ample evidence that judges of the Federal Circuit are highly heterogeneous when it comes to issues of patent validity. For instance, John Allison and Mark Lemley found that individual Federal Circuit judges’ rates of voting in favor of validity range from 33.3% (Judge Baldwin) to 75.6% (Judge Newman) across substantial numbers of votes.⁸⁰ In other words, some judges may be more than twice as likely to vote to hold a patent valid than other judges—and that is despite the moderating effects of serving on a panel with two other judges, an effect that usually tempers judicial extremes.⁸¹ If two judges with more expansive or less expansive views of patentability find themselves on the same panel, they may decide to issue a decision that deviates in one direction or another from the cutpoint of the Federal Circuit as a whole.⁸²

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77. See David L. Schwartz, *Practice Makes Perfect? An Empirical Study of Claim Construction Reversal Rates in Patent Cases*, 107 MICH. L. REV. 223 (2008) (finding no significant relationship between experience and the number of errors a district court judge will make in ruling on issues of patent claim construction). In addition, Federal Circuit judges may be experienced, but they are not particularly expert. See *supra* note 33.
78. See Duncan Black, *On the Rationale of Group Decision-Making*, 56 J. POL. ECON. 23, 29 (1948) (explaining that the median member of a decision-making body will control the outcomes of majority votes); Frank B. Cross, *Collegial Ideology in the Courts*, 103 NW. U. L. REV. 1399, 1418-19 (2009) (“The median voter theorem states that outcomes and opinions are dictated exclusively by the ideologically median member of the panel.”); cf. Lee Epstein & Tonja Jacobi, *Super Medians*, 61 STAN. L. REV. 37, 44-49 (2008) (discussing the role of the median judge on the Supreme Court).
79. See Lee Petherbridge, *Patent Law Uniformity?*, 22 HARV. J.L. & TECH. 421, 446-48 (2009) (finding substantial differences in outcomes amongst Federal Circuit judges).
80. John R. Allison & Mark A. Lemley, *How Federal Circuit Judges Vote in Patent Validity Cases*, 27 FLA. ST. U. L. REV. 745, 756 (2000).
81. See, e.g., Thomas J. Miles & Cass R. Sunstein, *The New Legal Realism*, 75 U. CHI. L. REV. 831, 835-41 (2008) (discussing “panel effects” in judging).
82. See Joshua B. Fischman, *Estimating Preferences of Circuit Judges: A Model of “Consensus Voting,”* 54 J.L. & ECON (forthcoming 2011); cf. Jaya Ramji-Nogales, Andrew I. Schoenholtz & Philip G. Schrag, *Refugee Roulette: Disparities in Asylum Adjudication*, 60 STAN. L. REV. 295 (2007) (finding large disparities in the treatment of immigrant asylum applicants by different asylum officers and immigration judges).

There is, however, the matter of existing precedent. Judges who disagree with the Federal Circuit's position on patentability will nonetheless feel bound to some degree by existing precedent and unable to simply decide cases as they might wish.⁸³ On the other hand, circuit precedent is not entirely binding; judges deviate from precedent on regular occasions, especially in the Federal Circuit, where inconsistent, competing legal approaches often persist for years.⁸⁴ In keeping with standard legal and political science models of judicial behavior, I assume that a judge's likelihood of voting to grant a patent is a function of the judge's own view of patent law (that is, the judge's cutpoint); existing circuit precedent (that is, the Federal Circuit's cutpoint); and where the patent itself falls relative to those cutpoints.⁸⁵ The farther the patent is to the left (right) of the judge's cutpoint, the more likely the judge is to grant (deny) the patent.⁸⁶ And the farther a judge would have to deviate from existing precedent in order to grant or deny a patent, the less likely she is to do so.⁸⁷

Under these circumstances, patentees with patentable inventions will continue to apply for patents. Their patents will always be granted by the PTO, and there will be no need to appeal to the Federal Circuit. There will be no false negatives—patents that should be granted but are not. However, some inventors with unpatentable inventions will *also* file for patents. They will understand that after the PTO denies their applications they can appeal to the Federal Circuit, and there is a chance that they will draw favorable (or errant) panels that will overturn the PTO's decisions and grant their patents. The number of such patentees who file for patents on unpatentable inventions will

83. W. Mark C. Weidemaier, *Toward a Theory of Precedent in Arbitration*, 51 WM. & MARY L. REV. 1895, 1925 (2010) (“[P]recedent constrains the discretion of future decision makers to some meaningful degree.”).

84. See *infra* notes 97-99 and accompanying text (describing the intracircuit conflict over the proper methodology of patent claim construction).

85. This approach is drawn from spatial voting models and has gained wide acceptance. See, e.g., Jonathan Bendor & Adam Meirowitz, *Spatial Models of Delegation*, 98 AM. POL. SCI. REV. 293 (2004) (employing a spatial model to explain delegation decisions); Kim, *supra* note 58, at 1347 (using a spatial model to analyze judicial voting); Keith T. Poole & Howard Rosenthal, *A Spatial Model for Legislative Roll Call Analysis*, 29 AM. J. POL. SCI. 357 (1985) (using a spatial model to explain congressional voting); Erik Voeten, *Legislator Preferences, Ideal Points, and the Spatial Model in the European Parliament* (Ctr. on Insts. & Governance, Working Paper No. 6, 2005), http://igovberkeley.com/sites/default/files/No6_Voeten.pdf (analyzing European voting with a spatial model).

86. Cf. Daniel B. Rodriguez & Barry R. Weingast, *The Paradox of Expansionist Statutory Interpretations*, 101 NW. U. L. REV. 1207, 1223-30 (2007) (using a spatial model to explain judges' statutory interpretation decisions).

87. Kim, *supra* note 58, at 1347-50.

depend on the costs and benefits involved: the cost of applying for a patent and appealing to the Federal Circuit, and the value of the patent if it issues, discounted by the likelihood that the Federal Circuit will uphold the PTO's decision. There will be few of these patentees (depending on these parameters), but there will not be zero. In other words, this institutional arrangement will generate some false positives—patents granted by the Federal Circuit that should not exist.

2. *The Contours of Patent Law*

The effects of such a system do not end with the fact that some bad patents will issue. In addition, this arrangement will have important, perhaps pernicious, consequences for the shape of patent law itself. In any appeal from a denial by the PTO, the Federal Circuit has essentially two options: a) affirm the Patent Office's denial, or b) reverse the PTO and grant the patent.⁸⁸ If the Federal Circuit affirms the PTO, it will likely do so based on governing circuit precedent, which the PTO followed.⁸⁹ Patent law will remain unchanged. But if it reverses the PTO and grants the patent, it will necessarily have created a new precedent, one that supports a broader scope of patentability, and one that will exert an influence on Federal Circuit judges going forward.

The strength of these new precedents—and thus the extent to which the boundaries of patentability expand—will depend on the reason for the Federal Circuit's departure from settled law.⁹⁰ If the Federal Circuit has simply

88. It can also vacate and remand for further consideration, but for present purposes that is operationally equivalent to reversing the PTO's decision.

89. Cf. William A. Klein, *Tailor to the Emperor with No Clothes: The Supreme Court's Tax Rules for Deposits and Advance Payments*, 41 UCLA L. REV. 1685, 1725 (1994) (describing the manner in which lawyers offer, and courts generally follow, arguments based on existing precedent). It is possible that repeated affirmations of existing law will effectively entrench those legal rules, making them more difficult to overturn. At the same time, it is possible that these seriatim affirmances will have zero or little effect. Yet even if the circuit's many affirmances exert some sort of inertial pull on patent law, this will only slow the rate of change, not eliminate it entirely.

90. It is well beyond the scope of this paper to elucidate an entire theory of precedent. Instead, I rely upon standard existing theories of how precedent impacts judicial behavior. See, e.g., Yeon-Koo Che & Jong Goo Yi, *The Role of Precedents in Repeated Litigation*, 9 J.L. ECON. & ORG. 399, 404-06 (1993) (developing a model of precedent regarding commonly litigated questions); Nicola Gennaioli & Andrei Shleifer, *The Evolution of Common Law*, 115 J. POL. ECON. 43, 53-57 (2007) (setting forth a theory of precedent and common law development); Nicola Gennaioli & Andrei Shleifer, *Overruling and the Instability of Law*, 35 J. COMP. ECON. 309, 323-24 (2007) (arguing that overruling precedent leads to instability and prevents the common law from evolving toward efficiency); Stefanie A. Lindquist & Frank B. Cross,

misjudged the invention's technology or misapplied the law, the precedent will likely have little value.⁹¹ But where the Federal Circuit offers a new statement of law, the new precedent will exert force.⁹² This is the case regardless of whether the court states this new legal rule intentionally—as a consequence of the panel composition—or unintentionally, as a result of error. These decisions will inflate the patent law, expanding the range of what is patentable.

Moreover, these legal expansions by the Federal Circuit will generate positive feedback effects. As the Federal Circuit's cutpoint moves with the creation of new precedent, so too will the PTO's. Every time the Federal Circuit moves the law, the PTO will respond accordingly, becoming slightly more permissive in granting patents. And because the only appeals that the Federal Circuit will see relate to applications that exceed this new cutpoint, it will continuously be presented with new opportunities to move the law *even further*. The inflationary cycle will repeat itself.

This process is not wholly unconstrained, however. In the Federal Circuit, one panel cannot overrule an opinion issued by another.⁹³ Only the court sitting en banc may do so.⁹⁴ Accordingly, no three-judge panel has the power to enact genuinely wholesale change. Nonetheless, newer panel opinions can chip away at old doctrines by creating exceptions or reaching opposite conclusions in analogous situations, even when they do not directly overrule existing precedent.⁹⁵ These new panel opinions then exert precedential force of

Empirically Testing Dworkin's Chain Novel Theory: Studying the Path of Precedent, 80 N.Y.U. L. REV. 1156, 1203-06 (2005) (providing empirical data on how judges behave with respect to precedent); Paul H. Rubin, *Why Is the Common Law Efficient?*, 6 J. LEGAL STUD. 51, 61-63 (1977) (arguing that the common law evolves toward efficiency because of rational decisions by litigants and judicial responses to those decisions); Frederick Schauer, *Precedent*, 39 STAN. L. REV. 571, 581-98 (1987) (offering a complete theory of precedent).

91. See Schauer, *supra* note 90, at 591-96 (explaining that precedent will be of little value when it covers only a very narrow category of cases).

92. See *id.* at 592-95 (categorizing the strength of legal precedents).

93. FED CIR. R. 35, available at <http://www.cafc.uscourts.gov/images/stories/rules-of-practice/rules.pdf>. This is in contrast to other courts of appeals that do allow one three-judge panel to overrule another. For instance, Seventh Circuit Local Rule 40(e) states:

A proposed opinion approved by a panel of this court adopting a position which would overrule a prior decision of this court or create a conflict between or among circuits shall not be published unless it is first circulated among the active members of this court and a majority of them do not vote to rehear en banc the issue of whether the position should be adopted.

7TH CIR. R. 40(e), available at <http://www.ca7.uscourts.gov/Rules/rules.pdf>.

94. FED CIR. R. 35 ("Although only the court en banc may overrule a binding precedent . . .").

95. See Christopher J. Peters, *Foolish Consistency: On Equality, Integrity and Justice in Stare Decisis*, 105 YALE L.J. 2031, 2034 (1996) (noting that lawyers and judges "regularly display amazing

their own in future cases, even cases that the Federal Circuit hears en banc.⁹⁶ In addition, the Federal Circuit is infamous for allowing apparently contradictory panel opinions to coexist for extended periods of time. For instance, for several years the circuit had two separate doctrines of claim interpretation.⁹⁷ Both stemmed from panel opinions,⁹⁸ and both claimed some number of adherents until the court, sitting en banc, discarded one in favor of the other.⁹⁹ The Federal Circuit is also generally reluctant to take cases en banc, having heard only forty-four cases en banc during the twenty-nine-year existence of the court at the time of this writing.¹⁰⁰ Accordingly, the fact that this effect is limited to panel opinions may curb its impact but will not eliminate it.

Still, the Federal Circuit will not function entirely as a one-way ratchet. The court could always seize upon a patent that the PTO has denied as a vehicle for retrenchment. The circuit could use the case to move the boundaries of patentability backwards, rather than merely affirming the PTO based on settled law. These cases will be rare, however, in part because they require the

ingenuity in ‘distinguishing’ unfavorable precedents that otherwise would be ‘controlling’). Compare *Gregory v. Chicago*, 394 U.S. 111, 111 (1969) (describing the case as “simple” and holding that there was a violation of the appellant’s First Amendment rights without mentioning conflicting precedent in *Feiner v. New York*, 340 U.S. 315 (1951)), with *Feiner v. New York*, 340 U.S. 315 (1951) (finding no violation of the First Amendment in a hostile audience case). See also Fredrick Schauer, *Easy Cases*, 58 S. CAL. L. REV. 399, 408 & n.21 (1985), which suggests that the Court was “selectively avoiding problems” by failing to mention *Feiner* in *Gregory* while calling *Gregory* a “simple case.”

96. Schauer, *supra* note 90, at 589.
97. See *Phillips v. AWH Corp.*, 415 F.3d 1303, 1312-14 (Fed. Cir. 2005) (explaining the history of the circuit’s rules on claim construction).
98. One approach focused on the literal meaning of claim terms as interpreted using dictionaries. See *Tex. Digital Sys., Inc. v. Telegenix, Inc.*, 308 F.3d 1193, 1201-05 (Fed. Cir. 2002). The other employed a more holistic approach. See *Vitronics Corp. v. Conceptor, Inc.*, 90 F.3d 1576, 1582-86 (Fed. Cir. 1996).
99. *Phillips*, 415 F.3d at 1312 (adopting the *Vitronics* approach). Despite *Phillips*, intra-circuit conflict over the proper methodology for construing claims continues. Compare *Markem-Imaje Corp. v. Zipher Ltd.*, 657 F.3d 1293, 1301 (Fed. Cir. 2011) (“That a device will only operate if certain elements are included is not grounds to incorporate those elements into the construction of the claims.”), with *Retractable Technologies, Inc. v. Becton, Dickinson & Co.*, 653 F.3d 1296, 1305 (Fed. Cir. 2011) (“In reviewing the intrinsic record to construe the claims, we strive to capture the scope of the actual invention, rather than strictly limit the scope of claims to disclosed embodiments or allow the claim language to become divorced from what the specification conveys is the invention.”).
100. See Christopher A. Cotropia, *Determining Uniformity Within the Federal Circuit by Measuring Dissent and En Banc Review*, 43 LOY. L.A. L. REV. 801, 817 (2010) (observing that the Federal Circuit goes en banc in a smaller proportion of cases than most other circuits); Ryan G. Vacca, *Acting like an Administrative Agency: The Federal Circuit En Banc*, 76 MO. L. REV. (forthcoming 2011), available at http://www.ssrn.com/abstract_id=1781277.

judges of the Federal Circuit to deviate from settled precedent in order to decide a case that they could decide simply by adhering to that precedent. This is something that courts have counseled against, and that judges are famously reluctant to do.¹⁰¹

In addition, any patent that the PTO has granted—from the most mundane and uncontroversial to those at the vanguard of current law—could be the subject of an infringement action, and thus the full panoply of allowed patents could still find their way to the Federal Circuit at one point or another. Infringement lawsuits involving patents well within the scope of existing law could provide the Federal Circuit with opportunities to dial back the reach of patentability.

On the whole, will the scope of patentability expand or contract? This will depend on how many true positives and true negatives come before the Federal Circuit. The true negatives will be patent applications that are denied by the PTO and appealed directly to the Federal Circuit; the true positives will be patents that the PTO properly grants that eventually find their way to the Federal Circuit in the course of infringement lawsuits. (There will be no false positives or false negatives because, by assumption, the PTO is unerring.) True positives (along with false negatives) allow the Federal Circuit opportunities to contract the scope of patentability, because reversing the PTO would involve narrowing the boundaries of what is patentable. True negatives (and false positives) provide opportunities for expansion because reversing the PTO involves broadening the boundaries of what is patentable.

Legal change will thus occur stochastically: each case that reaches the Federal Circuit will present some probability that the court will inflate or contract the law by deciding the case in a manner that does not accord with existing doctrine.¹⁰² A given case could lead to a larger or smaller change in the

101. See, e.g., *Markman v. Westview Instruments, Inc.*, 517 U.S. 370, 384 n.10 (1996) (expressing a reluctance to decide cases on any broader or more difficult ground than absolutely necessary); Michael J. Gerhardt, *Constitutional Humility*, 76 U. CIN. L. REV. 23, 26 (2007) (describing how influential judges have advocated for this type of narrow approach); Jonathan T. Molot, *Principled Minimalism: Restriking the Balance Between Judicial Minimalism and Neutral Principles*, 90 VA. L. REV. 1753, 1788-91 (2004) (explaining that the need to muster a majority on panels and the desire to avoid criticism limit judges to the narrowest grounds necessary to reach a decision); Cass R. Sunstein, *Beyond Judicial Minimalism*, 43 TULSA L. REV. 825, 836 (2008) (pointing out that institutional realities and implications for future decisions both make narrow decisions the sensible choice).

102. Cf. Anna M. Michalak, *Environmental Contamination with Multiple Potential Sources and the Common Law: Current Approaches and Emerging Opportunities*, 14 FORDHAM ENVTL. L. REV. 147, 160 (2002) (“[C]ommon law is statistical or stochastic in nature, because it deals directly with the uncertainty associated with estimates.”); Charles Yablon, *The Meaning of Probability Judgments: An Essay on the Use and Misuse of Behavioral Economics*, 2004 U. ILL. L.

law depending on the patent being granted or denied: if the Federal Circuit grants a truly outlandish patent or invalidates a previously uncontroversial one, the law will move substantially. If the patent at issue was much closer to the court's existing cutpoint, the change in the law will be more minor. Different precedents might also carry different weights, depending on how they are written.¹⁰³ But because it is a matter of random chance whether a court departs from existing law in a given case, overall change in the law will likely be proportional to the number of opportunities that a court has to alter the law in expansionary and contractive directions.

There will of course be many more patents granted than denied by the PTO, but relatively few of those patents will ever be subject to suits for infringement, much less suits that reach the Federal Circuit. For instance, in 2010, the PTO granted more than 1100 patents for each patent infringement or inequitable conduct case that the Federal Circuit adjudicated on the merits.¹⁰⁴ As a result, the net effect on the scope of patentability is indeterminate—at least in this contrived scenario. Given a more realistic picture of the PTO and Federal Circuit, the results are not so indefinite.

D. The Patent Office and Federal Circuit in Reality

The previous Sections demonstrated that on certain assumptions the interaction between the PTO and the Federal Circuit can generate both invalid patents and an inflationary (or deflationary) bias in patent law. However, those assumptions were not all realistic, and deliberately so. The preceding Sections were meant only to lay the theoretical groundwork for an analysis of the interaction between the two institutional bodies. This Section takes up that task.

REV. 899, 962-63 (“[T]here are some stochastic elements involved in the litigation process (jurors and judges are randomly assigned to cases) . . .”).

103. See *supra* notes 91-92 and accompanying text (observing that precedents based on errors or factual distinctions will carry less weight than those founded upon new statements of law).

104. Compare Patent Tech. Monitoring Team, *U.S. Patent Statistics Chart: Calendar Years 1963-2010*, PATENT & TRADEMARK OFF., http://www.uspto.gov/web/offices/ac/ido/oeip/taf/us_stat.htm (last modified May 13, 2011) (showing that the PTO granted 244,341 patents in 2010), with *Appeals Filed and Adjudicated, by Category, FY 2010*, U.S. CT. OF APPEALS FOR THE FED. CIR., http://www.cafc.uscourts.gov/images/stories/thecourt/statistics/Caseload_by_Category_Table_of_Data_2010.pdf (last visited Sept. 21, 2011) (showing that merits panels of the Federal Circuit adjudicated 220 patent cases arising from district courts in fiscal year 2010).

1. *The PTO*

This Subsection gives an account of what the Patent Office attempts to achieve when it examines patents. As described above, the PTO's official responsibility is to allow those patents that would be valid under the best possible interpretation of governing law.¹⁰⁵ Officially then, the PTO is expected to match its cutpoint to the Federal Circuit's. The patent system is designed such that the PTO is expected to grant only valid patents, per the legal definitions created by these other institutional actors, and to deny all other applications.

The PTO, as an institution, undoubtedly pursues this objective to at least some extent. But from the perspective of the individuals who actually manage the PTO (and those who examine patents), the PTO's institutional interest in enforcing the "correct" boundaries of patent law is actually quite weak.¹⁰⁶ The patent rules are not the PTO's own legal boundaries—they were created by the Federal Circuit.¹⁰⁷ Accordingly, PTO officials are likely to lack any significant personal investment in the contours of the rules, and it is unlikely that any high official will stand to reap significant psychic or reputational benefits if the PTO

^{105.} See *supra* note 4.

^{106.} Again, to be precise, inventors whose applications have been denied may appeal to the BPAI, an administrative court within the PTO, before taking their cases before the Federal Circuit. See 35 U.S.C. § 6(b) (2006) (establishing the BPAI); *supra* note 56. However, the BPAI is not an independent body. To the contrary, it resides under the control of senior PTO officials. The membership of the BPAI includes the PTO Director, the Deputy Commissioner, the Commissioner for Patents, and the Commissioner for Trademarks, as well as administrative patent judges. 35 U.S.C. § 6(a) (2006). These administrative patent judges are appointed by the Secretary of Commerce, "in consultation with the Director" of the PTO. *Id.* In effect, this means that the PTO Director controls the appointments. The judges do not have Article III tenure and salary protection. See *id.* In addition, the PTO Director has the authority "to designate BPAI panels that he 'hopes will render the decision he desires, even upon rehearing.'" Duffy, *supra* note 56, at 908 (quoting *In re Alappat*, 33 F.3d 1526, 1535 (Fed. Cir. 1994)). Moreover, before a decision of the BPAI acquires precedential force—that is, before it can bind examiners or the BPAI itself in the future—that decision must be approved by the PTO Director. *Publication of Opinions of the Board of Patent Appeals and Interferences*, U.S. PATENT & TRADEMARK OFFICE (Jan. 23, 2007), <http://www.uspto.gov/web/offices/com/sol/og/2007/week04/patopin.htm>. As a purely legal matter, it is undoubtedly the case that BPAI judges are not "alter ego[s] or agent[s]" of the PTO Commissioner. *Alappat*, 33 F.3d at 1535-36. But senior PTO administrators exert effective control over the law that emanates from the BPAI (as well as the more quotidian activities of examiners). Accordingly, this Article's analysis will treat the interests of the agency at large as mirroring those of its senior management.

^{107.} Again, Congress and the Supreme Court certainly play a role in the creation of patent law, albeit a small one. This role is discussed in greater detail *infra* Section II.F.

holds fast to existing law.¹⁰⁸ More importantly, there is no indication that PTO administrators are chosen based on their views of patent law and how those views accord with governing Federal Circuit precedent.¹⁰⁹ Adhering to the Federal Circuit's conception of patent law would seem to hold little inherent value for the Patent Office.

What else might the PTO and its top administrators wish to achieve when granting or denying patents? Like most administrative heads, officials at the PTO are interested in maximizing both their future career prospects and, to a lesser extent, their leisure time.¹¹⁰ Consider first the issue of an administrator's career. The administrator's future career opportunities are driven in large degree by her reputation.¹¹¹ Enhancing her reputation involves increasing the size, prestige, and resources of her administration,¹¹² on the theory that

108. See RICHARD A. POSNER, *HOW JUDGES THINK* 40-41 (2008) (describing the set of theories positing that decisionmakers prefer to decide questions in accordance with views or ideas they have constructed).

109. Presidential and congressional statements regarding nominees to head the PTO are noticeably devoid of so much as an allusion to the individual's substantive views on patent law, as opposed to his or her managerial experience. See, e.g., Press Release, Office of the White House Press Sec'y, President Obama Announces More Key Administration Posts (June 18, 2009), http://www.whitehouse.gov/the_press_office/President-Obama-Announces-More-Key-Administration-Posts-6-18-09 (statement of President Obama regarding PTO Director David Kappos); Press Release, Office of Sen. Patrick Leahy, Comment on the Designation of David J. Kappos To Be Undersecretary of Commerce for Intellectual Property and Director of the U.S. Patent and Trademark Office (June 18, 2009), http://leahy.senate.gov/press/press_releases/release/?id=40766b3c-7fa3-4c74-986e-d4378ae4665c.

110. See WILLIAM A. NISKANEN, JR., *BUREAUCRACY AND REPRESENTATIVE GOVERNMENT* 38 (1971) ("Among the several variables that may enter the bureaucrat's utility function are the following: salary, perquisites of the office, public reputation, power, patronage, output of the bureau, ease of making changes, and ease of managing the bureau."); Daryl Levinson, *Empire-Building Government in Constitutional Law*, 118 *HARV. L. REV.* 915, 932-34 (2005) (suggesting that agency bureaucrats are interested in maximizing discretionary budgets, ideological preferences, and the goals of their constituents); Michael A. Livermore, *Cause or Cure? Cost-Benefit Analysis and Regulatory Gridlock*, 17 *N.Y.U. ENVTL. L.J.* 107, 120 (2008) ("There is a wide variety of other goods that agency heads could pursue—such as prestige, nicer offices, intellectually stimulating work, leisure time, and future employment prospects . . ."); cf. Sidney A. Shapiro & Richard E. Levy, *Judicial Incentives and Indeterminacy in Substantive Review of Administrative Decisions*, 44 *DUKE L.J.* 1051, 1054 (1995) (arguing that "respect, ideological utility, and leisure" are judges' maximands).

111. See Mary K. Olson, *Managing Delegation in the FDA: Reducing Delay in New-Drug Review*, 29 *J. HEALTH POL. POL'Y & L.* 397, 401 (2004) ("FDA regulators care about their own professional reputations and the reputation of the agency because these reputations may influence their career prospects in and out of government.").

112. ANDRE BLAIS & STEPHANE DION, *THE BUDGET-MAXIMIZING BUREAUCRAT: APPRAISAL AND EVIDENCE* 6 (1991) (describing one bureaucratic strategy as "mainly, but not exclusively,

successfully managing an important organization demonstrates the administrator's ability.¹¹³

In order to increase the size and importance of the PTO, the administrator must satisfy those parties that control the Agency's budget: Congress and the President, and, by extension, the community of private parties who interact with the PTO and may lobby political actors for or against the Agency.¹¹⁴ However, these parties do not appear to have terribly strong preferences regarding the substantive content of patent law. Until this year, Congress and the President had not passed major legislation altering substantive patent law, which indicates a willingness to cede the shaping of the law to the courts.¹¹⁵ This political apathy is likely due to the fact that private interests are arrayed approximately equally for and against expansion in the scope of patent rights.¹¹⁶ Notwithstanding this apparent equality, the PTO has assumed a public posture of solicitude towards patent applicants, the class of private actors most likely to prefer expansive patent scope. The PTO refers to them as its "customers" and states that its mission is to serve their interests in obtaining patents.¹¹⁷ Yet in the aggregate, it is unlikely that Congress, the President, and private interests exert a strong pull on PTO behavior.

By contrast, the Federal Circuit holds the power to significantly and directly affect the interests of the PTO's administrators. The mechanism is the possibility of appeal and reversal. Like any administrative actor (or judge), officials at the PTO presumably place a high value on avoiding being reversed.¹¹⁸ Reversals by the Federal Circuit are costly in reputational terms

targeted at budgetary increases"); NISKANEN, *supra* note 110, at 38 (describing a bureaucrat's reputation as "a positive monotonic function of the total *budget* of the bureau during the bureaucrat's tenure in office").

113. NISKANEN, *supra* note 110, at 36-42.

114. *Id.* at 24 (describing administrators' desire to satisfy their financial sponsors); Levinson, *supra* note 110, at 932-34 (same); Long, *supra* note 34, at 1984-88 (suggesting that the PTO will often enlist the assistance of private parties in lobbying Congress for additional funding).

115. Long, *supra* note 34, at 1968 ("Since 1952, Congress has not taken much interest in amending the patent code, leaving the bulk of legal evolution to the courts.").

116. *E.g.*, Clarisa Long, Institutions and Interest Groups in Patent and Copyright Law 10 (2007) (unpublished manuscript) (on file with author).

117. *See, e.g.*, U.S. TRADEMARK & PATENT OFFICE, WORKING FOR OUR CUSTOMERS: A PATENT AND TRADEMARK OFFICE REVIEW (1994), available at <http://www.uspto.gov/web/offices/com/annual/1994/pg1-5.pdf>.

118. *Cf.* Albert A. Foer, *The Politics of Antitrust in the United States: Public Choice and Public Choices*, 62 U. PITT. L. REV. 475, 492 nn.42-43 (2001) (explaining that a concern for reputation may drive administrative heads to do a good job if for no other reason than to

and can threaten top officials' employment and public standing, not to mention their future employment prospects.¹¹⁹ Moreover, even appeals that the PTO eventually wins are very costly to the Agency. Because the PTO is entirely self-funded and operates on a fixed budget,¹²⁰ each dollar it spends litigating is one it cannot devote to hiring additional examiners, improving the quality of the PTO workspace, increasing the salaries of current employees, or otherwise providing material and nonmaterial benefits to the PTO workforce.¹²¹ Accordingly, even victorious appeals can reduce the leisure time available to the PTO administrator and her subordinates.¹²² Top officials at the PTO thus have strong incentives to avoid appeals, and in particular to avoid reversals.

maintain superior private-practice exit options); George A. Krause & James W. Douglas, *Institutional Design Versus Reputational Effects on Bureaucratic Performance: Evidence from U.S. Government Macroeconomic and Fiscal Projections*, 15 J. PUB. ADMIN. RES. & THEORY 281, 282 (2005) (observing that bureaucrats will seek to preserve their own reputations, and thus will avoid actions that might allow them to be "distinguished as inferior agents"); James P. Timony, *Performance Evaluation of Federal Administrative Law Judges*, 7 ADMIN. L. REV. AM. U. 629, 656 (1994) (explaining, with respect to administrative law judges, that "[j]udges generally are extremely cautious about their professional reputation They do not like to be reversed on appeal").

119. Cf. RICHARD A. POSNER, *OVERCOMING LAW* 118-19 (1995) (describing judges' aversion to reversal); Timony, *supra* note 118, at 656; Justin Fox & Matthew C. Stephenson, *Judicial Review and Democratic Failure* 6-10 (Harvard Law Sch. Pub. Law & Legal Theory Working Paper Series, Paper No. 09-47, 2009), http://www.ssrn.com/abstract_id=1458632 (describing the reputational harm to bureaucrats and elected leaders from judicial reversals). Of course, it is possible that being affirmed by the Federal Circuit is beneficial to the PTO's reputation. But it is unlikely to be as beneficial as being reversed is harmful. Even if being affirmed were equally important as being reversed, a risk-averse administrator would not likely choose to gamble the prospect of being reversed against an opportunity to be affirmed. And irrespective of this calculation, the PTO has an interest in avoiding appeals of any sort for financial reasons.
120. JAFFE & LERNER, *supra* note 5, at 11; Tony Dutra, *Obama Signs Bill Increasing PTO Funding in FY 2010, but Experts Say Not Enough*, 80 Pat. Trademark & Copyright J. (BNA) 497, 497 (2010) (noting that the PTO will be permitted to keep additional funds that it has collected and may spend the funds on "salaries and expenses"); Rai, *supra* note 30, at 2057 n.24 ("[T]he PTO is an entirely fee-funded organization.").
121. Tony Dutra, *PTO Announces Spending Cutbacks; Track One Prioritized Examination a Casualty*, 81 Pat. Trademark & Copyright J. (BNA) 853 (2011) (noting that the PTO will be forced to implement numerous cutbacks because Congress declined to release to it all of the fees it collected); Richard S. Markovits, *On the Economic Efficiency of Using Law To Increase Research and Development: A Critique of Various Tax, Antitrust, Intellectual Property, and Tort Law Rules and Policy Proposals*, 39 HARV. J. ON LEGIS. 63, 106 (2002) (explaining managers' tendency to spend money on perks such as "nicer offices" when they cannot keep the resources for themselves).
122. Arti Rai notes that the PTO "has not always been able to keep all of the fees that it collects In the 1990s, for instance, Congress diverted hundreds of millions of dollars in fee revenues

These are certainly not the only motivations present among top officials at the PTO. PTO officials undoubtedly have a whole spectrum of typical goals and objectives. The point is not that they are singlemindedly focused on their careers or the maximization of their own leisure time, to the exclusion of all else. The point, rather, is a) that they are not strongly tied to any particular conception of patent law, and b) that they have something very tangible to gain from avoiding appeals and reversals, and essentially nothing to gain from being appealed or reversed. Accordingly, PTO officials will tend to take actions that stand to benefit them by limiting their exposure to appeals.

2. *The Federal Circuit*

With respect to the Federal Circuit, the story is much simpler. The Federal Circuit, as the primary expositor of patent law, has a substantive, policy-driven interest in the content of the law.¹²³ Judges have individual policy preferences that shape their legal decisions. In addition, they would prefer not to be overturned by the Supreme Court, a fact that limits their legal options to at least some extent.¹²⁴

Other than substantive policy preferences, the objectives of Federal Circuit judges are fairly limited. They are paid in lockstep with other appellate

from PTO coffers.” Rai, *supra* note 30, at 2058 n.24; *see also* Figueroa v. United States, 66 Fed. Cl. 139, 143 (2005) (providing data on the percentage of fees the PTO has been allowed to keep.) The newly passed America Invents Act, Pub. L. No. 112-29, 125 Stat. 284 (2011), explicitly reserves all PTO fees for PTO activities, and would seem on its face to end this practice of fee diversion. *See id.* at § 22(a)(4)(2), 125 Stat. at 336 (“If fee collections by the Patent and Trademark Office for a fiscal year exceed the amount appropriated to the Office for that fiscal year, fees collected in excess of the appropriated amount shall be . . . made available until expended only for obligation and expenditure by the Office . . .”). Of course, a future Congress could simply override this provision in an appropriations law, again diverting PTO fees to other parts of the government. *See* Tony Dutra, *Lobbying Groups Accept Patent Reform, but Vow To Hold Congress to PTO Funding*, 82 Pat. Trademark & Copyright J. (BNA) 632 (2011). The actions of one Congress cannot impede the actions of a future Congress. *See* Eric A. Posner & Adrian Vermeule, Essay, *Legislative Entrenchment: A Reappraisal*, 111 YALE L.J. 1665, 1665 (2002).

123. *See supra* notes 57-59 and accompanying text (describing the attitudinal model of judging, which is driven largely by judges’ preferences regarding the substantive content of the law).

124. POSNER, *supra* note 108, at 140-41; *see also* Sara C. Benesh & Malia Reddick, *Overruled: An Event History Analysis of Lower Court Reaction to Supreme Court Alteration of Precedent*, 64 J. POL. 534, 547 (2002) (finding that lower court judges appear to adjust their behavior depending upon the perceived likelihood of reversal).

judges¹²⁵ and have essentially no prospects for advancement.¹²⁶ For most Federal Circuit judges, their current jobs are the last they will ever hold. In addition, they undoubtedly have preferences for leisure time and for good relations with their colleagues.¹²⁷ These factors will limit the number of dissents that they write, and they will also limit judges' willingness to hear cases en banc (a time-consuming and often rancorous process). But otherwise they should not much impact the judges' substantive decisionmaking.

As described above, the Federal Circuit as an institution has a cutpoint along any given legal dimension, with this cutpoint defined by existing law. As the previous sections explain, existing precedent will exert a constraining force: judges will be at least somewhat inclined in any given case to abide by the circuit's preexisting cutpoint.¹²⁸ Precedent will thus limit the cases in which the judges deviate from existing law. Particular judges, however, may have individual cutpoints to the left or right of this median point.¹²⁹ Thus, if two judges with cutpoints to the right of the circuit's cutpoint—that is, two judges with more permissive attitudes than the circuit as a whole—sit together on the same panel, they may elect to grant a patent that would not be patentable under governing law. Conversely, if two judges with cutpoints to the left of the circuit sit together, they may deny a patent that should be granted under current law.¹³⁰ If Federal Circuit judges were largely homogenous—if their

125. *Judicial Salaries Since 1968*, U.S. COURTS, <http://www.uscourts.gov/Viewer.aspx?doc=/uscourts/JudgesJudgeships/docs/JudicialSalarieschart.pdf> (last visited May 7, 2011) (listing salaries for federal judges and members of Congress).

126. No Federal Circuit judge has ever been appointed to the Supreme Court, or to any other significant government post. Nor has any Federal Circuit judge ever taken a substantial corporate sector job upon retirement from the Circuit, though Howard Markey did become dean of John Marshall Law School after leaving the court. See *History of the Federal Judiciary*, FED. JUDICIAL CTR., http://www.fjc.gov/history/home.nsf/page/research_categories.html (last visited Sept. 21, 2011) (providing full biographies of all retired judges).

127. POSNER, *supra* note 108, at 33, 36 (describing judicial preferences for good relations with colleagues and for leisure time). There are actually more dissents in the Federal Circuit than on the average federal court of appeals, but dissents still occur in only 3.51% of cases. Cotropia, *supra* note 100, at 816.

128. See *supra* Section II.C.

129. See Petherbridge, *supra* note 79, 445-49 (explaining this effect with respect to the Federal Circuit).

130. This analysis assumes that Federal Circuit judges vote “honestly”—that is, they vote their actual policy preferences, modified only by respect for precedent, desire to avoid dissenting, and fear of reversal from the Supreme Court. This is the most realistic description of the actual behavior of Federal Circuit judges, and it comports with how their behavior is generally understood. See Christopher R. Drahozal, *Judicial Incentives and the Appeals Process*, 51 SMU L. REV. 469, 474-77 (1998); see also POSNER, *supra* note 108, at 207 (“The judge is

individual cutpoints were similarly located—then any given three-judge panel would likely resemble the circuit as a whole, and there would not be a great deal of deviation from the full circuit’s cutpoint. But because there is a great deal of variance among Federal Circuit judges, the possibility exists that two judges on a panel will together form a majority with a viewpoint that diverges substantially from the circuit’s cutpoint.¹³¹

Finally, the judges of the Federal Circuit will simply err some proportion of the time, voting to grant patents that they mean to deny (or reject patents they mean to grant) because they misunderstand the technology at issue or the law.

3. *The Parties’ Interaction*

How, then, will the parties in this institutional arrangement behave?¹³² Consider first the PTO. In a typical administrative system, an agency like the PTO would have no choice but to adhere as strictly as possible to the governing law. If the Agency deviated from the Federal Circuit’s case law, the losing party would appeal and the PTO would risk having its decision overturned.¹³³ The further the Agency deviated from the governing legal rule, the greater would be its chances of reversal on appeal—and thus the more likely it would be that the losing party would appeal in the first instance.¹³⁴ The same is true for systems of civil litigation: the further a lower-court judge deviates from appellate

went to ask himself in such a case what outcome would be the more reasonable, the more sensible, bearing in mind the range of admissible considerations in deciding a case, which include but are not exhausted by statutory language, precedents, and the other conventional materials of judicial decision making, but also include common sense, policy preferences, and often much else besides.”). Nonetheless, a later Section will abstract away from even this assumption. See *infra* Section II.E.

131. For a description of the heterogeneity of Federal Circuit judges, see *supra* note 80 and accompanying text. Fischman, *supra* note 82, at 17, demonstrates this effect empirically for immigration cases in the Ninth Circuit.
132. The solution to this three-party game is effectively arrived at by backwards induction: the PTO reacts to how the Federal Circuit will behave, and private parties react to how both the PTO and the Federal Circuit will behave. This approach should be clear from the analysis. The behavior of the relevant parties is described in this order merely for ease of exposition and understanding.
133. Administrative Procedure Act § 10(e), 5 U.S.C. § 706 (2006) (setting forth the rules for judicial review of agency action).
134. Christina L. Boyd & James F. Spriggs II, *An Examination of Strategic Anticipation of Appellate Court Preferences by Federal District Court Judges*, 29 WASH. U. J.L. & POL’Y 37, 58-62 (2009) (explaining the constraining force exerted by the threat of reversal by a higher court and the way in which this pull depends upon precedent).

precedent, the more likely she is to be overturned by an appellate court, and thus the more probable it is that the losing party will bring an appeal.¹³⁵

The essential component in such a system is formal symmetry in appellate review. Consider, for instance, an environmental regulation promulgated by the Environmental Protection Agency. If an industry group views the regulation as overly restrictive, it can bring a challenge in federal court; if an environmental group views the regulation as insufficiently protective, it too can challenge the Agency's action.¹³⁶ This is not to say that industry and environmental challenges will always arise or succeed with equal frequency. But parties on each side have equal opportunity to challenge the regulation, and each must bear its own costs.¹³⁷ Symmetric review thus exerts a constraining force on agency behavior: the further the Agency moves *in either direction* from governing appellate law, the likelier its decision will be appealed and reversed.

This condition does not hold for the PTO. The administrative structure of patent law creates an asymmetry in appellate review, one that exists in few other places within the federal bureaucracy.¹³⁸ Only PTO denials will ever be appealed. Any applicant who receives a patent will simply depart the system, not to be heard from again until many years later (if ever).

Of course, this asymmetry is not absolute. Improvidently granted patents may eventually wind up in court if their owners file suit against alleged infringers. But this process is far slower and more haphazard. The typical case of patent litigation is decided only 8.6 years after the patent at issue was granted.¹³⁹ This figure includes cases that are resolved at both the district and appellate levels, and so it understates the age of patents that reach the Federal Circuit.¹⁴⁰ By the time a patent reaches the federal courts on a suit for infringement, the individuals who were involved with the patent's grant—

135. See Daniel B. Rodriguez, *The Positive Political Dimensions of Regulatory Reform*, 72 WASH. U. L.Q. 1, 98 (1994) (“The judge may also feel constrained by other factors, such as her belief that the intent of the framers of the statute must be implemented, or her belief in precedent.”); Schauer, *supra* note 90, at 596 (describing the pull exerted by precedent).

136. See 5 U.S.C. § 706; *Lujan v. Defenders of Wildlife*, 504 U.S. 555 (1992) (establishing rules of standing that govern private challenges to administrative actions).

137. See *Alyeska Pipeline Serv. Co. v. Wilderness Soc’y*, 421 U.S. 240, 247 (1975) (describing the “American Rule” in which each party typically bears its own costs).

138. For a partial list, see *supra* notes 19-23.

139. John R. Allison & Mark A. Lemley, *Empirical Evidence on the Validity of Litigated Patents*, 26 AIPLA Q.J. 185, 234-40 (1998); see also John R. Allison et al., *Valuable Patents*, 92 GEO. L.J. 435, 477 (2004) (providing similar data).

140. Allison & Lemley, *supra* note 139, at 194.

including the PTO Director – will likely have left office.¹⁴¹ In addition, the PTO is not a party to these lawsuits, and thus does not have to expend resources in litigation. It also cannot be declared the “losing party” in formal terms. The prospect of having a patent declared invalid in the course of infringement litigation is not insignificant for the PTO. But it is far less salient than the threat of direct appeals from the Agency’s patenting decisions.

How then, is the PTO likely to behave? If the Patent Office simply attempted to match the Federal Circuit’s cutpoint – tried to follow the law, that is – it would undoubtedly err in some cases. These errors would produce both false negatives and false positives: the PTO would grant some patents that the Federal Circuit would not hold valid, and it would deny some patents that the Federal Circuit believes should be granted. False positives are not particularly costly to the Patent Office; in those cases, the patentee is simply granted a questionable patent, and the PTO’s labors end. But false negatives give rise to appeals and likely reversals by the Federal Circuit, at significant expense to the PTO.¹⁴²

Nor would it benefit the PTO to hold a firm line against questionable patents in an effort to reduce the total number of applications (and its workload). The PTO has no real interest in diminishing the numbers of applications that are filed. Like any organization, the PTO has both fixed costs and variable costs.¹⁴³ The fixed costs are the costs of general PTO administration, maintaining the PTO buildings, and so forth; the variable costs are the costs of each additional application, such as the cost of hiring additional examiners.¹⁴⁴ Reducing the number of applications would reduce the variable costs but not the fixed costs. The PTO obtains all of its funding from the fees

141. There have been six PTO Commissioners since 1993, none of whom has held the job for more than five years. See *List of Persons Who Have Headed the United States Patent Office*, WIKIPEDIA, http://en.wikipedia.org/wiki/List_of_persons_who_have_headed_the_United_States_Patent_Office (last visited Sept. 5, 2011). Generally speaking, very few government employees remain in their jobs longer than eight years. However, precise information regarding lower-level employees at the PTO is difficult to acquire. See Mark A. Lemley & Bhaven Sampat, *Examiner Characteristics and Patent Office Outcomes* 22 (Jan. 1, 2009) (unpublished manuscript), <http://ssrn.com/abstract=1329091> (“A first problem is data: we lack direct information about whether examiners are tenured or untenured.”).

142. See *supra* Subsection II.D.1.

143. Cf. Christopher S. Yoo, *Network Neutrality, Consumers, and Innovation*, 2008 U. CHI. LEGAL F. 179, 217 (“The production of most goods and services requires the incurrence of two types of costs: fixed costs and variable costs.”).

144. Cf. Einer Elhauge, *Why Above-Cost Price Cuts To Drive Out Entrants Are Not Predatory – and the Implications for Defining Costs and Market Power*, 112 YALE L.J. 681, 690 n.19 (2003) (“A fixed cost is a cost that does not vary with output levels. A variable cost is a cost that varies with output levels. Total costs are the sum of fixed and variable costs.”).

accompanying patent applications, and it must pay both its fixed costs and its variable costs with those fees.¹⁴⁵ If the PTO were to reduce the number of applications, it would have fewer application fees across which to spread its fixed costs, and therefore fewer resources to devote to these fixed costs. This would mean cuts to top administrators' budgets and reductions in their leisure time, precisely what those administrators are presumably trying to avoid.¹⁴⁶ PTO administrators would also face reputational harms, as aggrieved applicants appealed PTO denials of patent applications. Those reputational harms would be exacerbated by the fact that the Federal Circuit grants minimal (if any) deference to PTO denials of patent applications.¹⁴⁷

Accordingly, one would expect the self-interested administrators of the Patent Office to minimize the number of appeals and reversals. The PTO could avoid review and reversal by approving every patent. Yet the Patent Office does face some constraints: if it were to grant literally every patent, or even every plausible patent, it would face harsh criticism or sanction from Congress, the President, and the patenting community.¹⁴⁸

The PTO is thus forced to deny some patents, but it will err on the side of approving every application that the Federal Circuit is at all likely to grant. In other words, the Patent Office will treat the Federal Circuit's cutpoint as more of a floor than an optimal target. So long as the PTO is at least as lenient as the Federal Circuit, it has little reason to fear reversal. And the more lenient the PTO is (subject to constraints from Congress or the patenting community), the less likely it is to be reversed. The PTO loses little by this strategy. Although improperly granted patents can impose severe costs on other private parties (or the economy at large),¹⁴⁹ the individuals who govern the PTO do not

145. See Rai, *supra* note 30, at 2057 n.24. It is reasonable to assume that PTO fees are greater than the PTO's variable costs, or else the agency would have already gone broke.

146. See *supra* notes 121-122 and accompanying text.

147. See Arti Rai, *Addressing the Patent Gold Rush: The Role of Deference to PTO Patent Denials*, 2 WASH. U. J.L. & POL'Y 199, 206 n.20, 213, 220 (2000) (listing cases in which the Federal Circuit has overturned a PTO patent denial without even purporting to afford it deference); Arti K. Rai, *Allocating Power over Fact-Finding in the Patent System*, 19 BERKELEY TECH. L.J. 907, 913 (2004) ("[O]ne key problem has been the Federal Circuit's failure to recognize that the USPTO can, and should, be allowed to insert its knowledge of the art into the patent examination process."). This is despite the fact that the Supreme Court has held that the Federal Circuit should overturn PTO findings only if they are "arbitrary, capricious, . . . an abuse of discretion, or . . . unsupported by substantial evidence." *Dickinson v. Zurko*, 527 U.S. 150, 152 (1999) (quoting 5 U.S.C. § 706 (1994)).

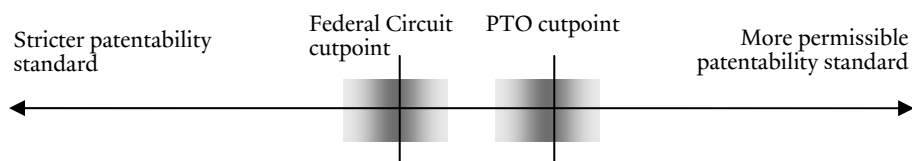
148. The PTO may already be nearing this limit. See *supra* note 5 and accompanying text.

149. See *Heller & Eisenberg*, *supra* note 5; *Leslie*, *supra* note 36.

internalize these costs.¹⁵⁰ The result is that the PTO will set its cutpoint far enough to the right of the Federal Circuit's to ensure that it will not errantly deny a patent application that the Federal Circuit will later grant. In addition, by minimizing the chance of being overturned by the Federal Circuit, the PTO will hope to minimize the number of inventors who even bother to appeal. Figure 6 represents this strategy graphically, with the areas of potential error again shaded:

Figure 6.

THE FEDERAL CIRCUIT AND PTO IN COMBINATION



The Federal Circuit's cutpoint is public information, though it may be costly to discover—inventors can simply read the Federal Circuit's published opinions. The PTO's cutpoint is also public information, though it may be even costlier to discover.¹⁵¹ Inventors may understand that the PTO will be more permissive than the Federal Circuit, but they cannot know by how much. They will also be uncertain of the PTO and Federal Circuit's rates of error.

In anticipation of a lenient PTO, inventors have strong incentives to file even dubious patent applications.¹⁵² Inventors will get two bites at the apple: the PTO might grant a patent that exceeds the Federal Circuit's cutpoint; and even if the PTO does not grant the patent, a favorable panel of Federal Circuit

150. PTO administrators might be forced to internalize these costs if private parties complained about excessive patenting to political leaders, who then took action or asserted pressure against the Patent Office. However, as noted above, private interests are arrayed roughly evenly in favor of and against broader patent rights. See Long, *supra* note 116, at 15. More to the point, in many industries a particular firm might both own *and* be accused of violating patents that would be invalid under a strict interpretation of Federal Circuit precedent. There is thus no natural constituency positioned to oppose excessive patent grants by the PTO.

151. The BPAI decides several thousand appeals per year. See *BPAI Receipts and Dispositions by Technology Center*, U.S. PATENT & TRADEMARK OFFICE, <http://www.uspto.gov/web/offices/dcom/bpai/docs/receipts/> (last visited Sept. 5, 2011).

152. Of course, they have even stronger incentives to file for valid patents, as there is every expectation that such patents will be granted.

judges might do so. Consequently, inventors will file applications for patentable inventions in large numbers, and will file substantial quantities of applications on unpatentable inventions as well.¹⁵³

The PTO will thus produce true positives (patents it should grant and does), false positives (patents it should not grant but does, out of an abundance of caution), and true negatives. This third category is made up of patents that exceed the Federal Circuit's cutpoint, and that the PTO denies, either as a matter of random error or because they are too outlandish even for that Agency. However, the PTO will generate very few false negatives—patents that the Federal Circuit would normally approve, but that the PTO denies. It is precisely to avoid false negatives—and the likelihood of appeal and reversal—that the PTO sets its cutpoint to the right of the Federal Circuit's. Consistent with this prediction, the Federal Circuit has reversed the PTO in only 11.8% of cases since 1997, and approximately 15% of cases since it was created in 1982,¹⁵⁴ compared with a general rate of reversal across all civil cases of approximately 20%.¹⁵⁵

4. *Granted Patents and Expansionary Doctrine*

Consider now the results of the institutional interaction between the PTO and the Federal Circuit. Figure 7 (below) is a schematic representation of how the PTO will dispose of the variety of patent applications presented to it. The dots arrayed horizontally along the patentability spectrum represent patent applications. The further left the dot, the more patentable it is; the further

153. Cf. Gregory Mandel, *The Non-Obvious Problem: How the Indeterminate Nonobviousness Standard Produces Excessive Patent Grants*, 42 U.C. DAVIS L. REV. 57, 105-09 (2008) (arguing that indeterminacy in the nonobviousness standard will cause patentees to file applications on unpatentable inventions, leading to some obvious patents which then further muddy the legal standard and cause the cycle to repeat).

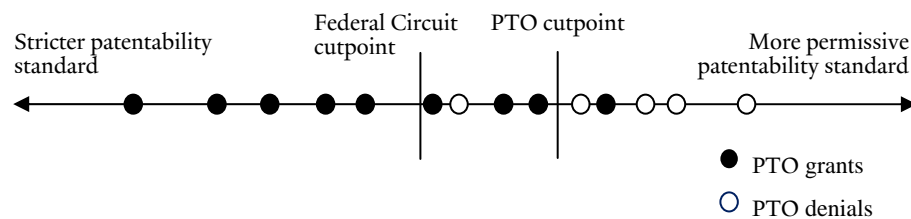
154. See *supra* note 14. The PTO typically reports that its examiners are highly accurate, based on a random sample of reviewed examiner actions. See *Patent Examination Quality*, U.S. PATENT & TRADEMARK OFFICE, <http://www.uspto.gov/dashboards/patents/main.dashxml> (last visited Sept. 5, 2011). However, there is no way to know the standard by which the PTO is actually judging accuracy. The suggestion here is that the cutpoint against which these examiners are being measured is actually to the right of the Federal Circuit's cutpoint. The PTO is successful at adhering to its own standards of patentability, which are not necessarily the court's.

155. Kevin M. Clermont, *Litigation Realities Redux*, 84 NOTRE DAME L. REV. 1919, 1970 (2009); see also Kevin M. Clermont & Theodore Eisenberg, *Appeal from Jury or Judge Trial: Defendants' Advantage*, 3 AM. L. & ECON. REV. 125, 130-34 (2001); Kevin M. Clermont & Theodore Eisenberg, *Plaintiphobia in the Appellate Courts: Civil Rights Really Do Differ from Negotiable Instruments*, 2002 U. ILL. L. REV. 947, 968-71 (2002).

right, the more unpatentable it is. Black dots represent hypothetical PTO patent grants; white dots represent hypothetical patent denials. As the preceding section explained, the PTO will grant nearly all applications that fall to the left of its cutpoint and deny nearly all applications that fall to the right of its cutpoint.¹⁵⁶ From time to time, random errors and heterogeneity among patent examiners will cause the PTO to grant a patent to the right of its cutpoint or deny a patent to the left of its cutpoint. (In Figure 7, the PTO has granted one application to the right of its cutpoint and denied one application to the left of its cutpoint.) However, because the PTO will deliberately set its cutpoint to the right of the Federal Circuit's cutpoint, it will grant applications that the Federal Circuit would typically deny.¹⁵⁷

Figure 7.

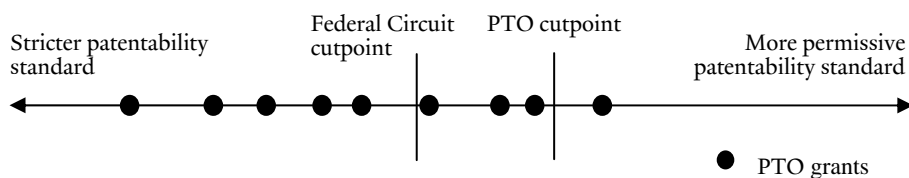
THE PTO'S TREATMENT OF PATENT APPLICATIONS



As an initial matter, it is important to note that the PTO's actions will generate a substantial number of invalid patents, just as commentators have observed.¹⁵⁸ Consider just the granted patents from Figure 7.

Figure 8.

GRANTED PATENTS



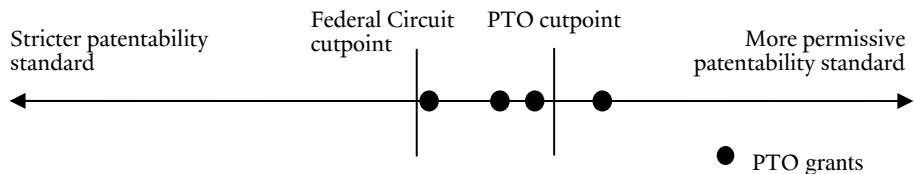
¹⁵⁶ See *supra* Subsection II.D.3.

¹⁵⁷ See *supra* Subsection II.D.3.

¹⁵⁸ See sources cited *supra* note 5.

Of these granted patents, some number of them will fall to the right of the Federal Circuit’s cutpoint, simply by virtue of the fact that the PTO has set its own cutpoint to the right of the Federal Circuit’s. Figure 9 displays just these patents.

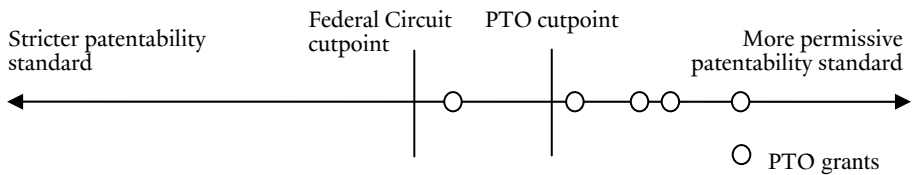
Figure 9.
IMPROPERLY GRANTED PATENTS



These are the false negatives the PTO will grant in an effort to avoid reversal—the invalid patents that scholars have decried as a cost to the system and a drag upon innovation.¹⁵⁹

What effect will the PTO’s strategy have upon the shape of patent law? As the preceding section explained, when the PTO grants a patent there can be no appeal to the Federal Circuit, and thus no opportunity for the Federal Circuit to shift the law. Only patent denials can lead to substantive legal changes.¹⁶⁰ Figure 10 displays the patent applications that have been denied by the PTO.

Figure 10.
DENIED PATENTS



¹⁵⁹. See sources cited *supra* notes 5 & 36-42 (describing the proliferation of invalid patents and their costs).

¹⁶⁰. Again, to be specific, there are two mechanisms by which the question of patent validity could present itself to the Federal Circuit. True and false negatives may be appealed directly to the court; true and false positives might find their way before the court if they are involved in suits for infringement. This second mode is discussed further below. See *infra* Subsection II.D.5.

Importantly, the vast majority of these patent denials will fall to the right of the Federal Circuit's cutpoint. (That is, they will be true negatives—applications that the PTO should deny and does.) This is precisely the PTO's intent in setting its own cutpoint to the right of the Federal Circuit's: to minimize the number of applications it denies that the Federal Circuit might later grant. There is thus a pronounced asymmetry in patent appeals—nearly every case that the Federal Circuit hears on direct appeal from the PTO will concern a boundary-pushing patent, one that it would ordinarily deny under governing law.¹⁶¹

In some cases, a disappointed patent applicant will not bother to appeal to the Federal Circuit, figuring that it is unlikely to convince the circuit to grant the patent. And in many cases when the applicant does appeal, the Federal Circuit will affirm the PTO and deny the patent. After all, nearly all of these PTO denials will involve inventions that the Federal Circuit does not believe are patentable. Recall that when the Federal Circuit affirms the PTO's refusal to issue a patent that is unpatentable under current law, it will most likely leave the law unchanged. Because the PTO's denial was in accordance with governing law, the Federal Circuit can simply affirm based on that existing precedent.¹⁶²

However, every once in a while, as a matter of random chance or because of a favorable panel draw, the Federal Circuit will grant one of these patents.¹⁶³ In Figure 11, this decision by the Federal Circuit is represented by a striped dot.

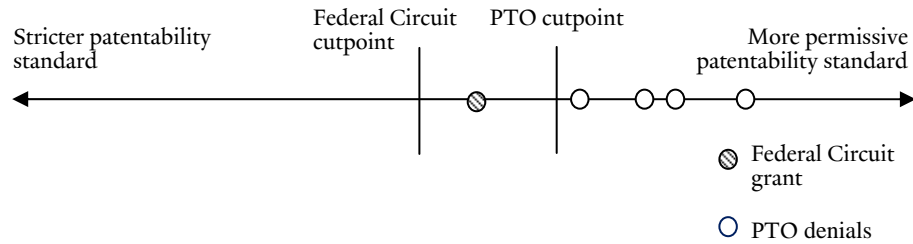
161. In Figure 10, no PTO denials fall to the left of the Federal Circuit's cutpoint. Of course, this is merely a graphical representation, and occasionally the PTO may deny a patent to the left of the circuit's cutpoint. The point is simply that PTO denials will be heavily biased to the right of the Federal Circuit's cutpoint. Even if a few fall to the left, they will be well outweighed by the many denials on the other side.

162. See *supra* note 89 and accompanying text.

163. Again, there is substantial evidence that some Federal Circuit judges are very favorably inclined towards patents in general while others are substantially more skeptical. See *supra* note 80 and accompanying text. This is also the reason that this Article has described patent inflation as a phenomenon that particularly characterizes the relationship between the PTO and the Federal Circuit. The Court of Customs and Patent Appeals (CCPA), the predecessor court to the Federal Circuit, only sat *en banc*. Jeffrey A. Lefstin, *The Constitution of Patent Law: The Court of Customs and Patent Appeals and the Shape of the Federal Circuit's Jurisprudence*, 43 LOY. L.A. L. REV. 843, 850 (2010). There was no opportunity for a favorable panel to issue a boundary-stretching decision, and thus much less inflationary pressure on the law.

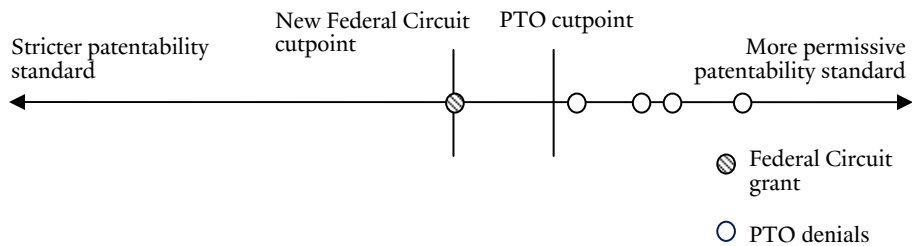
PATENT INFLATION

Figure 11.
THE OCCASIONAL FEDERAL CIRCUIT PATENT GRANT



When the Federal Circuit overturns a PTO denial in this fashion, it creates a new precedent—one that expands the boundaries of patentability. The Federal Circuit’s cutpoint will shift rightward because of the force of this new precedent.¹⁶⁴ Figure 12 displays this effect:

Figure 12.
PATENT INFLATION



The result is patent inflation: outward growth in the boundaries of what inventions may be patented. Even if each new precedent does not stretch the boundaries of patentability to their fullest extent (as indicated in Figure 12), it will exert some additional force. When the next case arises, Federal Circuit judges will be slightly more likely to rule in favor of patentability. And because the PTO will continue to move its own cutpoint to the right in order to provide itself with the necessary margin for error to avoid reversals, the cycle will

¹⁶⁴. This should occur regardless of whether a given legal requirement for patentability involves “continuous” or “lumpy” variables—that is, whether there can be small incremental changes or only slightly larger, quantized ones. Cf. Lee Ann Fennell, *Revealing Options*, 118 HARV. L. REV. 1399, 1420-21 n.88 (2005) (discussing the difference between perfectly divisible and lumpy quantities). Even if a requirement is lumpy, movements between those nodes will be possible so long as the “lumps” are not spaced too far apart—and Part III provides evidence that they are not in at least one domain. I thank Lee Fennell for raising this point.

repeat. Each time the Federal Circuit moves its cutpoint slightly, the PTO will do the same. The Agency will continue to send primarily boundary-stretching cases to the circuit. And the boundaries of patentability will continue to expand outward—just as they have since the advent of the Federal Circuit.¹⁶⁵

In theory, there could be retrenchment in the law if the PTO were to reject an application to the left of the Federal Circuit's cutpoint. The most likely outcome is that the Federal Circuit would reverse the PTO and grant the patent. If, on the other hand, a Federal Circuit panel instead elected to affirm the Agency and deny the patent, this new precedent would lead to contraction in the legal boundaries defining patentability. Yet PTO denials that fall to the left of the Federal Circuit's cutpoint—false negatives—will be extremely rare and vastly outnumbered by true negatives. This is precisely why the PTO sets its cutpoint to the right of the Federal Circuit: to avoid false negatives that could become appeals and reversals. The predominance of true negatives over false negatives means that the Federal Circuit will have many more opportunities to expand the law than to contract it. The result will be an overall bias towards inflation.

This inflation will be slow and stochastic. From time to time, individual cases may slow the law's outward expansion or even lead to retrenchment. Outside forces, described in more detail below, may constrain the PTO or the Federal Circuit.¹⁶⁶ And judges may behave differently with regard to some doctrines than others. But over the course of years and decades, the pressure placed on the law by asymmetric rights of appeal from the PTO should lead to inflation in the boundaries defining what inventions may be patented. As I explain above, this analysis assumes that any given judge's decision in a patent case is a function of her own personal preferences (over the substantive content of the law, her relations with her colleagues, etc.) and existing precedent. If new inflationary precedents affect a judge's own preferences over the law—for instance, by changing her view as to what "normal" patent law should look like—then inflation could in theory continue unabated. Each new inflationary precedent would alter both the existing state of the law and the judges' personal preferences. However, it is not necessary to the argument that new precedents affect judges' personal preferences. Even if they do not, inflation will still occur as a result of these new precedents and their influence on judicial decisionmaking.

However, if new precedents do not change judges' personal views, those views will act as a brake on limitless inflation. As the law expands, it will

¹⁶⁵. See *supra* note 6 and accompanying text.

¹⁶⁶. See *infra* Section II.F.

eventually reach a point at which no judge is willing to go further—no judge would favor granting a patent more outlandish than the last one granted by the Federal Circuit. To be precise, this point will come when the law matches the cutpoint of the second-most permissive, patent-friendly judge on the court. Once that judge is willing to go no further, there is no second judge with whom the most permissive judge on the court can form a majority. At this point the law could only expand further through judicial error, not through a favorable panel draw. Most legal analyses assume that the law of a circuit court will be defined by its median member.¹⁶⁷ This analysis shows that over time, patent law could come to be defined instead by the second-most outlying member of the court.¹⁶⁸

Accordingly, the boundaries of patentability will not necessarily inflate indefinitely. There may come a point at which the next patent is simply a bridge too far for all (or all but one) of the judges of the Federal Circuit. Considering that patent law has continued to expand over the past three decades, if that point exists it is likely beyond the status quo.

5. Patent Inflation and Suits for Infringement

At the same time, the PTO will also generate true and false *positives*—the many patents (valid or not) that it grants. These patents could eventually arrive before the Federal Circuit in the course of a suit for infringement. False positives present additional opportunities for the Federal Circuit to expand the scope of what is patentable; true positives provide chances to contract it. At first glance, it might appear that the latter of these effects should dominate. There will be many more true positives than false positives, simply because such a large percentage of patent applications submitted to the PTO will be patentable under existing law. Accordingly, one might imagine that infringement lawsuits will mainly afford the Federal Circuit opportunities to

¹⁶⁷. See *supra* note 78 and accompanying text.

¹⁶⁸. It is worth noting that the composition of the court will change over time, and entering members may hold more (or less) permissive views than departing ones. For instance, members of the patent bar who were educated in the 1990s may have more expansive visions of the law than members who were educated in the 1970s, simply because the law had become more expansive by that point and they had been taught that such an expansive version of the law was appropriate. If this were the case, and older judges with more restrictive views were continually replaced by younger judges with more expansive views, the law could continue to inflate over time because of the court's changing membership. However, this is only speculative; it is difficult to determine whether these effects are occurring.

contract the scope of patentability, and that this will balance the effect of the true negatives appealed directly to the court.

Yet this is not the case. Consider again the types of patents that the PTO will grant, depicted in Figure 8. Not every patent involved in an infringement suit is equally likely to have its validity adjudicated by the Federal Circuit. The reason is that parties are more likely to settle obvious cases with certain outcomes, leaving only close cases for the circuit to decide.¹⁶⁹ In any type of civil litigation, settlement is driven by certainty: the more that the parties agree on the probable outcome at trial, the more likely they are to settle.¹⁷⁰ The cases that will reach trial – not to mention appeal – are those in which the outcome is uncertain.¹⁷¹ If a patent is obviously valid or invalid – far to the left or right of the Federal Circuit’s cutpoint – the parties are very unlikely to disagree about the likely outcome at trial. Without disagreement, there is no reason to expend the resources necessary to have the court adjudicate it. Accordingly, the patents that reach the appellate court in infringement suits should be clustered around the Federal Circuit’s cutpoint – sometimes slightly to the left, sometimes slightly to the right, but always close enough to the cutpoint that the outcome of the case is uncertain.¹⁷²

In fact, the selection effects that drive litigated cases towards the Federal Circuit’s cutpoint should be especially strong in the context of appellate cases – those cases that hold the potential to alter the law. The reason is that the parties have opportunities to settle the case both before and after the district court renders a decision. Cases that reach the Federal Circuit will have run two selection gauntlets, each of which weeds out cases at the extremes. The only cases that remain will be close ones.¹⁷³

169. George L. Priest & Benjamin Klein, *The Selection of Disputes for Litigation*, 13 J. LEGAL STUD. 1, 6-17 (1984).

170. See William M. Landes, *An Economic Analysis of the Courts*, 14 J.L. & ECON. 61, 101-02 (1971); Richard A. Posner, *An Economic Approach to Legal Procedure and Judicial Administration*, 2 J. LEGAL STUD. 399, 417-20 (1973). The reason for this phenomenon is the transaction costs involved in litigation. If the parties can agree regarding what a judge and jury will do, there is no reason for them to incur the transaction costs of actually undergoing a trial just to reach that outcome. See Landes, *supra*, at 101-02; Posner, *supra*, at 417-20; see also John Bronsteen, Christopher Buccafusco & Jonathan S. Masur, *Hedonic Adaptation and the Settlement of Civil Lawsuits*, 108 COLUM. L. REV. 1516, 1520-22 (2008) (explaining this point).

171. See John P. Gould, *The Economics of Legal Conflicts*, 2 J. LEGAL STUD. 279, 296-97 (1973) (seeking to show why a larger percentage of lawsuits are settled out of court than in court).

172. Cf. *id.* at 285 (describing the types of cases that should reach trial under the author’s model).

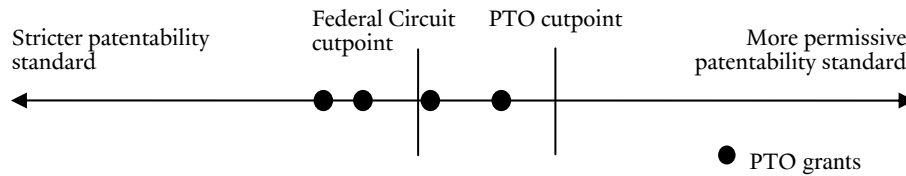
173. Interestingly, Allison and Lemley found that all courts, both district and circuit, hold patents valid 54% of the time. Allison & Lemley, *supra* note 139, at 205. This is not far from the 52% figure that Allison and Lemley report for Federal Circuit cases alone, and thus it

Accordingly, the patents that come before the Federal Circuit in infringement lawsuits should be arrayed approximately symmetrically around the Circuit's cutpoint. The reasons are twofold. First, the level of uncertainty in cases to the right and left of the cutpoint should be relatively equal.¹⁷⁴ And second, the number of patents granted by the PTO that are just to the left and right of the cutpoint should be approximately equivalent. This is because the PTO will endeavor to grant every application that is near the Federal Circuit's cutpoint, even if slightly to the right of it.¹⁷⁵ Indeed, consistent with this expectation, a 1998 study found that Federal Circuit judges uphold patents as valid in 52% of cases.¹⁷⁶ Those patents are depicted in Figure 13 below:

may be that the appellate process is not winnowing the cases significantly. *See id.* at 241. Regardless, these data indicate that cases are quite evenly divided around the Federal Circuit's cutpoint

174. *Cf.* Priest & Klein, *supra* note 169, at 4-5 (proposing that this symmetry in uncertainty will lead to symmetric results at trial, with plaintiffs and defendants each winning approximately 50% of cases). If anything, cases to the right of the cutpoint—those involving patents that push the frontiers of the law—should be more uncertain.
175. *See supra* Subsection II.D.1. It is of course possible that relatively well-established patentability questions will reach the Federal Circuit as companions to less certain infringement issues within a single lawsuit. Yet these will not likely provide a source of much movement in the law. Lawyers for the defendant will be unlikely to push the issue of validity, and courts will most commonly opt to decide the case on the easier (infringement) grounds. *Cf.* Adam B. Cox & Thomas J. Miles, *Judicial Ideology and the Transformation of Voting Rights Jurisprudence*, 75 U. CHI. L. REV. 1493, 1509 (2008) (demonstrating that judges will decide cases on factual or procedural grounds that involve less contravention of precedent and possibility of reversal whenever such grounds are available to them).
176. Allison & Lemley, *supra* note 139, at 241. A later study of the same data revealed that 54% of the votes cast by Federal Circuit judges were to uphold the patent at suit as valid, and 46% of those votes were to invalidate the patent. Allison & Lemley, *supra* note 80, at 755. Patent law has never satisfied the strong form of the Priest-Klein hypothesis, which predicts that plaintiffs and defendants will each win approximately 50% of their lawsuits. Instead, patent plaintiffs win barely a quarter of the cases they file. Mark A. Lemley, *Fractioning in Patent Law* 3 (Stanford Pub. Law Working Paper No. 1895681, 2011), <http://ssrn.com/abstract=1895681>. This is a significant finding, but for the argument here the only important question is how the patents that reach the Federal Circuit in infringement lawsuits are distributed with respect to that circuit's cutpoint. The 52% figure noted in the text suggests that those patents are approximately equivalently distributed around the circuit's cutpoint, just as the theory presented above would predict. The fact that patent plaintiffs have such a low win rate overall is not to the contrary.

Figure 13.
LITIGATED PATENTS



As a result, patent law will be subject to an overall inflationary pressure. Cases that reach the Federal Circuit via suits for infringement will provide the circuit with approximately symmetric opportunities to expand and contract the boundaries of patentability.¹⁷⁷ Cases that reach the Federal Circuit on direct appeal from the PTO will predominantly provide opportunities to expand the boundaries of patentability. A symmetric effect in one type of case coupled with an asymmetric effect in another will lead to an overall asymmetry in the development of the law—here, in an inflationary direction.

Importantly, the foregoing analysis gives rise to a set of testable predictions regarding changes in the law. When the Federal Circuit has occasion to consider a legal doctrine only (or primarily) in the context of a suit for infringement—for instance, the doctrine of equivalents—there is no reason to

177. In fact, there might even be a slight bias toward expansion within infringement suits. When the PTO grants a patent, it is presumed valid and will only be invalidated by a court upon a showing of clear and convincing evidence. *Microsoft Corp. v. i4i Ltd. P'ship*, 131 S. Ct. 2238, 2242 (2011); *Spanson, Inc. v. Int'l Trade Comm'n*, 629 F.3d 1331, 1344 (Fed. Cir. 2010). Thus, all else being equal, the courts are more likely to affirm false positive patents than they are to overturn false negatives. Because affirmations of false positives lead to expansion in the law, the overall trend from these cases might be slightly inflationary.

On the other hand, it is conceivable that courts would not treat affirmances and reversals of the PTO in symmetric fashion. Perhaps the Federal Circuit is more likely to break new ground when it reverses the PTO than when it affirms it, simply due to the revisionary nature of reversals. If this were true, reversals of false positives (in the course of suits for infringement) might have a greater effect on the law than affirmances of false negatives (on direct appeal from the PTO). This is of course possible, but it seems unlikely. When the Federal Circuit creates law, it is creating that law with reference to existing precedent. The extent to which the court will rely upon or argue against that existing precedent depends upon how far its new decision deviates from that precedent, not whether the decision is handed down as an affirmance or a reversal. After all, any court of appeals is concerned with how its latest decisions interact with its existing jurisprudence, not how they interact with decisions by an inferior body—much less a nonjudicial agency. Accordingly, we should expect that the Federal Circuit will treat affirmances and reversals symmetrically, subject only to the caveat in the preceding paragraph regarding the presumption of validity.

believe that the law will move in a particular direction; infringement suits offer symmetric opportunities for legal change. But when a legal question frequently reaches the Federal Circuit on direct appeal from the PTO—as do issues related to patentability—there will be a net inflationary pressure on the frontiers of the law. When it comes to the doctrines governing patentability, the Federal Circuit will be presented with more and better opportunities to enlarge the boundaries than to narrow them. The result will be an overall tendency in the direction of more permissive patenting rules.¹⁷⁸

While a full empirical examination is beyond the scope of this Article, there is at least suggestive evidence to support these predictions. As noted above, scholars have observed a Federal-Circuit-led expansion in the scope of patentability over the past several decades.¹⁷⁹ Conversely, there is much less evidence of patent-friendly trends in doctrines related exclusively to infringement.¹⁸⁰

E. A Strategic Federal Circuit

Throughout the preceding discussion, patent applicants, officials at the PTO, and Federal Circuit judges have all behaved strategically. All three groups of actors care about the outcomes in particular cases: inventors make strategic decisions regarding which applications to file; the PTO makes strategic decisions regarding which patents to grant in order to avoid review and reversal; and Federal Circuit judges to uphold only the patents they believe should have been granted.

Of course, the Federal Circuit could conceivably behave *even more* strategically. Federal Circuit judges might recognize the theory described here and understand that natural mechanisms of selection tend to expand the boundaries of patentability. In response, they might take a number of steps. They might make special efforts to create new, more constraining precedent in the course of rejecting an invention that is unpatentable under existing law,

178. This is of course not to say that the law will always move *exclusively* in the direction of more lenient standards of patentability. The effect is an overall one—on balance, the law will expand the boundaries outward. Along the way, however, it will presumably move in fits and starts.

179. See sources cited *supra* note 5-6.

180. See, e.g., *In re Seagate Tech. L.L.C.*, 497 F.3d 1360 (Fed. Cir. 2007) (making it more difficult for patent holders to collect heightened damages for willful infringement); Lee Petherbridge, *On the Decline of the Doctrine of Equivalents*, 31 CARDOZO L. REV. 1371, 1384 (2010) (showing that the narrowed scope of the doctrine of equivalents has led to fewer successful infringement claims in recent years).

contrary to typical judicial practice.¹⁸¹ They might also vote strategically against self-interest in certain cases. For instance, a judge could vote against granting a patent that she would prefer to see issued simply in order to forestall the law's outward momentum, figuring that without such action the law would eventually expand beyond her cutpoint.

It is possible that Federal Circuit judges are engaging in this type of strategic behavior, but it is quite unlikely. The judges would have to be aware of the expansion of patent law and understand that it is a natural consequence of the asymmetry in PTO appeals, rather than simply a reflection of the median circuit judge's preferences. (If it were the latter, this type of strategic action would be unproductive.) This would require a focus on issues with which circuit judges do not typically concern themselves, not to mention a surprising level of tactical shrewdness from a circuit that has not previously displayed any such inclination.¹⁸²

In addition, patent applicants could conceivably counteract highly strategic behavior by the Federal Circuit with strategic behavior of their own. Many patent applicants are repeat players who file for hundreds of patents per year.¹⁸³ At least some of these applicants undoubtedly have an ongoing interest in expanding the boundaries of patentability, to the point of being willing to sacrifice a single patent in the interest of more favorable long-term rules.¹⁸⁴ If one of these applicants appealed a PTO denial and drew a Federal Circuit panel that seemed particularly inclined towards narrower patentability rules, the applicant could elect voluntarily to dismiss the case.¹⁸⁵ This would deprive the restrictive Federal Circuit panel of a vehicle by which to retrench the law. Of course, it is difficult to determine whether applicants have in fact adopted this

181. Cf. Schauer, *supra* note 90, at 589 (showing that judges make decisions anticipating their effect on future cases).

182. Cf. *A Conversation with Chief Judge Paul Michel*, THE IP COLLOQUIUM (Jan. 5 2009), <http://www.ipcolloquium.com/Programs/4.html>.

183. See Press Release, IFI CLAIMS Announces Top Global Companies Ranked By 2010 U.S. Patents (Jan. 10, 2011), <http://www.ificlaims.com/news/top-patents.html> (listing the firms that obtained the most U.S. patents in 2010).

184. Cf. Galanter, *supra* note 15, at 97-99 (describing repeat legal players and their incentives).

185. See *supra* note 80 and accompanying text (describing the variability in Federal Circuit attitudes towards patent validity). I thank Michael Gilbert and others for suggesting this possibility. The Federal Circuit only announces which judges will be hearing any given case on the day that case is argued. Samuel P. Jordan, *Early Panel Announcement, Settlement, and Adjudication*, 2007 BYU L. REV. 55, 60. But this should not pose any impediment to the strategy described above. Applicants will simply wait until after the oral argument—by which point they may have a great deal of information regarding the judges' intentions—before deciding whether or not to drop the case.

strategy. But at minimum it gives rise to another testable prediction: the greater the number of patent applications a given party files each year, and the less patent-friendly a Federal Circuit panel is, the more likely the applicant is to voluntarily dismiss an appeal before that Federal Circuit panel.¹⁸⁶

Perhaps this issue is best understood from the opposite perspective. It is undeniable that the Federal Circuit has significantly expanded the boundaries of what is patentable over the past two decades.¹⁸⁷ Scholars have posited various reasons for this trend, including pro-patent ideology and the possibility that the circuit has been captured by pro-patent interests.¹⁸⁸ Although these accounts may be correct, this Article has suggested that the expansion in patentability can be explained without any of them. It may be wholly or in part a natural consequence of the institutional relationship between the PTO and Federal Circuit. If judges of the Federal Circuit are acting strategically in order to frustrate this natural momentum, then the expansion of patentability over the past two decades must be due to some other factor, such as ideology or capture. This would mean that Federal Circuit judges were acting strategically in order to frustrate an expansion of the law that they themselves favored. Such a peculiar confluence of motives and actions seems highly unlikely.

In the end, it is impossible to know with certainty precisely how Federal Circuit judges will behave. There may be significant heterogeneity within the circuit as to the level of strategic behavior, just as there is significant heterogeneity on substantive patent issues. This highlights the importance of the testable prediction (described in Subsection II.E) regarding inflation in some areas of law but not others. If further research validates that prediction, then the judges of the Federal Circuit have not adopted the overly strategic posture described here.

F. Outside Actors and Patent Remedies

Despite the Federal Circuit and PTO's predominant role in shaping patent law, their interaction is not a closed system.¹⁸⁹ Congress, the Supreme Court, and even other federal agencies can also exert significant influence, though they

¹⁸⁶. This prediction is thus somewhat counterintuitive precisely because the Federal Circuit only announces panels on the day of oral argument. See Jordan, *supra* note 185, at 60. By that point, it should be nearly costless for the applicant to proceed with the case—all of the work has been done. Accordingly, the decision to drop the appeal must rest upon an assessment of its impact on future cases, as the applicant has nothing to lose in the present case.

¹⁸⁷. See *supra* note 6 and accompanying text.

¹⁸⁸. See sources cited *supra* note 34.

¹⁸⁹. I thank Peter Menell for suggesting this conceptual approach.

intervene only rarely. More importantly, these outside actors are not subject to the pressures and selection effects described above, which are endemic only to the relationship between the PTO and the Federal Circuit. Accordingly, Congress, the Supreme Court, and other federal agencies can in some circumstances act as checks on the PTO and Federal Circuit's inflationary tendencies.

For its part, Congress has largely been absent from this field.¹⁹⁰ For many years after the creation of the Federal Circuit, the Supreme Court was similarly reticent and granted certiorari in very few patent cases.¹⁹¹ This might have been due to the technical complexity of patent cases, the Court's belief that the Federal Circuit possessed greater patent expertise, or even the Court's satisfaction with the shape and direction of the law. Lately, however, the trend has relaxed, and the Supreme Court has decided nine patent cases since 2005.¹⁹² Commentators have suggested that the Court has lately become dissatisfied with the Federal Circuit's stewardship of patent law and is acting to rein in the circuit's expansionary tendencies.¹⁹³

This could be a welcome corrective. But it is not complete. Even an aggressive Supreme Court cannot staunch the flow of improperly granted patents from the PTO. The PTO will still possess an incentive to grant every application that the Federal Circuit might conceivably allow, irrespective of where the courts set the legal cutpoint. Without external adjustment of the PTO's incentives, the PTO will continue to err in the direction of granting more patents than it should. It is also difficult to rely on continued activism on the part of the Supreme Court, given the recent nature of that trend.

190. See Long, *supra* note 34, at 1968.

191. See Mark D. Janis, *Patent Law in the Age of the Invisible Supreme Court*, 2001 U. ILL. L. REV. 387, 387-89 (noting the Supreme Court's withdrawal from patent law since the creation of the Federal Circuit).

192. See *Microsoft Corp. v. i4i Ltd. P'ship*, 131 S. Ct. 2238 (2011); *Bd. of Trs. of Leland Stanford Jr. Univ. v. Roche*, 131 S. Ct. 2188 (2011); *Bilski v. Kappos*, 130 S. Ct. 3218 (2010); *Quanta Computer, Inc. v. LG Elecs., Inc.*, 553 U.S. 617 (2008); *KSR Int'l Co. v. Teleflex Inc.*, 550 U.S. 398 (2007); *Microsoft Corp. v. AT&T Corp.*, 550 U.S. 437 (2007); *MedImmune, Inc. v. Genentech, Inc.*, 549 U.S. 118 (2007); *eBay Inc. v. MercExchange, L.L.C.*, 547 U.S. 388 (2006); *Merck KGaA v. Integra Lifesciences I, Ltd.*, 545 U.S. 193 (2005); see also Golden, *supra* note 34, at 658 ("[T]he Supreme Court has, in the past six years, asserted its dominion over patent law with frequency and force.").

193. See, e.g., Peter Lee, *Patent Law and the Two Cultures*, 120 YALE L.J. 2, 44 (2010) (noting that "[f]or most observers, the Court's aggressiveness reflects an attempt to rein in patent rights that had become too expansive under Federal Circuit jurisprudence").

Finally, the President or other executive-branch agencies might intervene and push against the PTO's permissive tendencies.¹⁹⁴ There is some evidence that this has already taken place in limited fashion: the National Institutes of Health and other organizations, fearful of an expansion in patenting, were able to compel the PTO to adopt stricter utility guidelines for biotechnology.¹⁹⁵ (In fact, this may be the only area of law in which the PTO takes a more restrictive view than the Federal Circuit.) There are also indications that actions by the Department of Justice and Federal Trade Commission may have exerted influence on the patent system.¹⁹⁶ However, these intercessions have been sporadic and confined to limited contexts. The President could also intervene directly, either by instructing the PTO to grant fewer patents or by appointing a PTO Director committed to enforcing a more restrictive view of the law. But there is little evidence that the President has ever done so.¹⁹⁷

How, then, can the problems of bad patents and inflationary law best be remedied? One option would be for Congress or the President to recalibrate the PTO's incentives by providing additional funding for the Agency to litigate appeals, removing the stigma of reversal, or committing to evaluating the Agency based on the quality of the patents it issues without regard to which patents are eventually litigated.¹⁹⁸

Perhaps the most direct solution would be a workable system of inter partes review that would allow outside parties to challenge substantial numbers of patents before they are issued.¹⁹⁹ However, a purely administrative

194. I thank Arti Rai for suggesting this possibility.

195. See Rai, *supra* note 53, at 1131-32.

196. See, e.g., Edward Lee, *Introduction: The Future of Patent Reform*, 4 ISJLP 1, 2 (2008) (stating that "[a]fter the [FTC] report, both Congress and the United States Supreme Court suddenly turned their attention to patent law reform").

197. The current PTO Director, David Kappos, has on occasion described improved patent quality as a priority and announced various initiatives toward that end. See, e.g., David Kappos, *Taking Steps To Improve Patent Quality*, U.S. PATENT & TRADEMARK OFFICE (Oct. 19, 2010, 3:50 PM), http://www.uspto.gov/blog/director/entry/taking_steps_to_improve_patent. Of course, the PTO Director has little to lose from verbally expressing a commitment to patent quality, and it is hard to know what to make of the PTO's examination standards without knowing precisely how the agency evaluates whether a patent was properly granted. Nonetheless, there is cause for at least mild optimism.

198. For instance, Congress could convene an advisory panel of patent experts to evaluate the quality of a random sample of issued patents. Another more radical solution would be to grant the PTO substantive rulemaking authority. See Jonathan S. Masur, *Regulating Patents*, 2010 SUP. CT. REV. 275, 279 (2011).

199. See, e.g., JAFFE & LERNER, *supra* note 5, at 184-86 (proposing a system of post-grant inter partes review); Farrell & Merges, *supra* note 48, at 964-69 (same); Lichtman & Lemley,

challenge system located entirely within the PTO would not be sufficient. Such a system would undoubtedly provide the PTO with better information regarding the validity of a putative patent and enable it to make a more accurate decision, but it would not cure the Agency's fundamental incentive to grant, rather than deny, borderline patents. Rather, the crucial ingredient is an opportunity for challengers who lose before the PTO to appeal to the Federal Circuit—in other words, a mechanism for *symmetric* review of PTO decisions. The possibility that aggrieved parties could appeal substantial numbers of both patent denials and patent grants would discipline the PTO. With little to gain from an overly permissive stance, the Agency would be forced to evaluate patent applications as much in accordance with governing law as possible. The Agency would be more likely to make symmetric errors around its own (and the Federal Circuit's) cutpoint, and the cases that reached the Federal Circuit would be more equally divided between false negatives and false positives.²⁰⁰ Accordingly, the Circuit would have approximately as many opportunities to expand the law as to contract it, muting the inflationary effect.

Existing law allows any participant in an inter partes action to appeal to the Federal Circuit.²⁰¹ What is necessary, then, is to amend the inter partes procedures such that they will come into wide use.²⁰² At the same time, inter partes review could potentially be abused by parties interested only in delaying and harassing competitors. Any expansion of that system should be designed to guard against such misfeasance. There are undoubtedly a variety of other reforms that would have salutary effects on PTO and Federal Circuit behavior. But if the patent system's malfunctions are indeed attributable in part to the institutional relationship between the PTO and Federal Circuit, it seems appropriate to deploy an institutional corrective in response.

supra note 5, at 63-65 (favoring such a system). The defects of the current system that prevent parties from taking full advantage of it are described, *supra* note 49.

200. This system would not likely result in perfect symmetry because outside parties might not appeal patent grants in the same numbers that disappointed applicants appealed patent denials. Nonetheless, the numbers of each type of appeal would be much closer than they are under the current administrative arrangement.

201. America Invents Act, Pub. L. No. 112-29, §329, 125 Stat. 284, 311 (2011); Patent and Trademark Office Authorization Act of 2002, 35 U.S.C. § 315 (2006).

202. See *supra* note 49 (describing the very low usage rates of inter partes review and suggesting reasons that it is rarely utilized).

III. THE PATENTING OF SOFTWARE AND BUSINESS METHODS

In order to demonstrate the effects of patent inflation in practice, this Part presents a case study of the development of the rules on patentable subject matter governing software and business method patents, culminating in the Federal Circuit and Supreme Court decisions in *Bilski v. Kappos*.²⁰³ Whether an invention recites patentable subject matter is of course only one of the many hurdles to patentability, but it is the subject perhaps most at the forefront of debates over the scope of patent law, due in large part to the *Bilski* decisions.²⁰⁴

The last two decades have seen a rapid expansion in the patenting of intangible processes such as software and business methods. The story of software and business method patents is not entirely clean and straightforward—not surprisingly, given the number of moving parts—but it is possible to draw some distinct conclusions. As *Bilski* demonstrates, both the PTO and the Federal Circuit have played significant roles in this expansion. In particular, the PTO has consistently operated at the vanguard of the law, granting patents that the Federal Circuit has not yet announced it would allow. As a result, the PTO and the Federal Circuit may have unwittingly conspired to inflate the boundaries of patentability, just as the theory described above would predict.

A. Software Patents, Business Methods, and State Street Bank

As recently as 1981, it was only by a five-to-four vote that the Supreme Court held that an inventor could patent a method for curing rubber.²⁰⁵ By the mid-1990s, however, the PTO and the Federal Circuit were presiding over a rapid expansion of the boundaries of patentable subject matter, an expansion that encompassed a variety of processes and methods far more intangible than the rubber-curing method at issue in 1981.²⁰⁶ The groundwork for this expansion had been laid by patents on computer software, which first emerged

203. 130 S. Ct. 3218 (2010), *aff'g In re Bilski*, 545 F.3d 943 (Fed. Cir. 2008) (en banc).

204. See, e.g., ROBERT PATRICK MERGES & JOHN FITZGERALD DUFFY, PATENT LAW & POLICY: 2009-10 SUPPLEMENT 3 (2009).

205. *Diamond v. Diehr*, 450 U.S. 175 (1981).

206. MERGES & DUFFY, *supra* note 33, at 154 (describing the “floodgates” of software patents opening in the mid-1990s); Justin M. Lee, Note, *The Board Bites Back: Bilski and the B.P.A.I.*, 24 BERKELEY TECH. L.J. 49, 49 (2009) (describing the late 1990s as a “period of considerable expansion in subject-matter eligibility”).

in the late 1960s²⁰⁷ and were well accepted by the mid-1990s.²⁰⁸ Yet in the early and mid-1990s, neither the Supreme Court nor the Federal Circuit had sanctioned patents on business or financial methods.²⁰⁹

The legal uncertainty surrounding business method patents did not chill the PTO. In the early nineties, without any explicit signal from the court, the PTO began granting patents on a variety of business and financial methods. These patents covered subjects ranging from a system for assessing health care liabilities,²¹⁰ to client management software,²¹¹ to a life insurance method,²¹² to a retail store checkout process,²¹³ among many other inventions.²¹⁴ The fact that the Federal Circuit had sanctioned software patents should not have provided much impetus, given the number of commentators who believe that software

207. *In re Prater*, 415 F.2d 1378 (C.C.P.A. 1968) (adjudicating the validity of software patents for the first time), *aff'd in part, rev'd in part*, 415 F.2d 1393 (C.C.P.A. 1969).

208. *See, e.g., In re Beauregard*, 53 F.3d 1583 (Fed. Cir. 1995) (allowing software patent); *In re Alappat*, 33 F.3d 1526, 1544 (Fed. Cir. 1994) (en banc) (same).

209. Scholars and courts have struggled to define a “business method” (as distinct from any other type of patentable process). Nonetheless, they have managed to coalesce around a general understanding: a business method is a means of doing business and turning a profit that is typically unconnected from the production of any tangible good. *See, e.g.,* Keith E. Maskus & Eina Vivian Wong, *Searching for Economic Balance in Business Method Patents*, 8 WASH. U. J.L. & POL'Y 289, 289 (2002) (“Business method patents (BMPs) award exclusive rights to inventors for novel techniques that perform commercial functions not embodied in specific physical inventions.”); *cf.* Allison & Hunter, *supra* note 45 (generally using a definition consistent with this idea). Included in this definition are methods for reducing the amount of taxes an individual must pay, methods for creating and selling financial products, and methods for structuring transactions between a business and a customer. *See, e.g.,* U.S. Patent No. 5,960,411 (filed Sept. 12, 1997) (method for placing an order to purchase an item via the Internet); *see also Amazon One-Click Patent Slides Through Reexamination*, PATENTLY-O (Mar. 10, 2010, 3:06 AM), <http://www.patentlyo.com/patent/2010/03/amazon-one-click-patent-slides-through-reexamination.html>. Included also are methods for reducing risk or creating other advantageous business conditions. *See, e.g.,* U.S. Patent Application No. 08/833,892, at A-5 (filed Apr. 10, 1997), *available at* http://www.uspto.gov/go/com/sol/2007-1130bilski_joint_appendix.pdf.

210. U.S. Patent No. 5,136,502 (filed Oct. 2, 1991).

211. U.S. Patent No. 5,001,630 (filed Dec. 20, 1988).

212. U.S. Patent No. 5,752,236 (filed Sept. 2, 1994).

213. U.S. Patent No. 5,256,863 (filed Nov. 5, 1991).

214. *See, e.g.,* U.S. Patent No. 5,568,541 (filed June 21, 1994) (method for identifying and billing phone surcharges); U.S. Patent No. 5,253,166 (filed Mar. 29, 1991) (system for sharing airline itineraries with corporate clients); U.S. Patent No. 5,220,500 (filed Sept. 19, 1980) (program to assist with investment strategies);

should be patentable and business methods unpatentable.²¹⁵ On the contrary, the PTO was simply willing to push the law forward without waiting for an explicit signal of validity from the Federal Circuit—consistent with the theory presented here.²¹⁶

That signal finally came in 1998. In *State Street Bank & Trust Co. v. Signature Financial Group, Inc.*,²¹⁷ the Federal Circuit held for the first time that business methods constituted patentable subject matter.²¹⁸ The court explained that an inventor could patent “a data processing system . . . for implementing an investment structure,” though it suggested that it was important that the process be tied to a machine of some sort.²¹⁹ Signature Financial Group’s patent claimed not only a very general “computer processor means,” but also some specific structures for storing and retrieving data and making various types of calculations.²²⁰ However, the Federal Circuit held the invention patentable without reaching the question of whether the patent must necessarily involve a machine, or what requirements that machine must meet.²²¹ By any measure, the Signature patent qualified.

B. *Bilski in the Courts*

State Street Bank “opened the floodgates on business method patents.”²²² Over the next decade, the PTO issued patents on a wide variety of business

215. See Alan L. Durham, “Useful Arts” in the Information Age, 1999 BYU L. REV. 1419, 1515; Michael J. Meurer, *Business Method Patents and Patent Floods*, 8 WASH. U. J.L. & POL’Y 309, 334 (2002); Leo J. Raskind, *The State Street Bank Decision: The Bad Business of Unlimited Patent Protection for Methods of Doing Business*, 10 FORDHAM INTELL. PROP. MEDIA & ENT. L.J. 61, 84-85 (1999).

216. See Jonathan M. Barnett, *Property as Process: How Innovation Markets Select Innovation Regimes*, 119 YALE L.J. 384, 416 (2009) (explaining that a “change in 1996 PTO examination guidelines” opened the door to substantial numbers of business method patents in advance of the Federal Circuit’s decision in *State Street Bank*).

217. 149 F.3d 1368 (1998).

218. *Id.*

219. *Id.* at 1370-71.

220. *Id.* at 1371-72 (referencing U.S. Patent No. 5,193,056 (filed Mar. 11, 1991)).

221. *Id.*

222. Douglas L. Price, *Assessing the Patentability of Financial Services and Products*, 3 J. HIGH TECH. L. 141, 153 (2004).

methods with little impedance (or guidance) from the Federal Circuit. A decade later, the Federal Circuit again took up the issue in *In re Bilski*.²²³

Bernard Bilski filed an application on “[a] method for managing the consumption risk costs of a commodity sold by a commodity provider at a fixed price.”²²⁴ Bilski was effectively attempting to patent the idea of hedging risk: a consumer of a good (for instance, a power company that used coal as fuel) would purchase that commodity at a fixed price from a producer (the coal company).²²⁵ The consumer would be protected against a rise in the price of the commodity; the producer would be protected against a fall in the price.²²⁶ Bilski’s application was denied by the PTO, and Bilski appealed to the Federal Circuit.

Importantly, this patent application was an outlandish one even by the standards of business method patents—and not just because people had been hedging risk for centuries.²²⁷ Unlike the patent in *State Street Bank*,²²⁸ Bilski did not attach any sort of machine to his claims.²²⁹ They were merely free-standing money-making ideas, unmoored from any connection to the physical world.²³⁰ It is thus not surprising that Bilski’s application, which pushed well beyond the boundaries set by *State Street Bank*, was rejected by the PTO and appealed to the Federal Circuit. It is precisely this type of boundary-pushing application—and not any sort of standard invention—that theory predicts will find its way to the courts.

Bilski’s invention was undoubtedly unpatentable on any number of grounds, not least of all because it was obvious in light of centuries of prior

223. 545 F.3d 943 (Fed. Cir. 2008) (en banc), *rev’d*, *Bilski v. Kappos*, 130 S. Ct. 3218 (2010). It is worth noting that while *State Street Bank* reached the Federal Circuit in the course of litigation, *Bilski* arrived on appeal from the PTO’s denial of Bilski’s patent.

224. U.S. Patent Application No. 08/833,892, *supra* note 209, at A-6.

225. *Id.*; see also *Bilski*, 545 F.3d at 949.

226. *Bilski*, 545 F.3d at 949 (“In essence, the claim is for a method of hedging risk in the field of commodities trading.”).

227. See, e.g., Mark D. West, *Private Ordering at the World’s First Futures Exchange*, 98 MICH. L. REV. 2574 (2000) (describing a seventeenth-century Japanese futures exchange used by traders to hedge against price fluctuations).

228. *State St. Bank & Trust Co. v. Signature Fin. Grp., Inc.*, 149 F.3d 1368, 1371 (Fed. Cir. 1998). Bilski’s “invention” was also far more tenuous than the sorts of business method patents that have been approved in cases such as *AT&T Corp. v. Excel Commc’ns, Inc.*, 172 F.3d 1352 (Fed. Cir. 1999), which upheld a patent on a telephone service provider’s system for logging telephone calls over various networks.

229. U.S. Patent Application No. 08/833,892, *supra* note 209.

230. See *id.*

practice.²³¹ But before the Federal Circuit reached that issue,²³² it held that the invention was merely an abstract idea and thus constituted unpatentable subject matter.²³³ The court declared that a process can be patented only if: (1) it is “tied to a particular machine or apparatus,” or (2) it transforms a particular “article[] or material[] to a ‘different state or thing.’”²³⁴ Because *Bilski*’s invention involved neither a machine nor the transformation of any matter, it failed the Federal Circuit’s test.²³⁵

At first glance it might appear that *Bilski* represented not an expansion in the law, but a retrenchment. Indeed, the Federal Circuit rejected Bernard *Bilski*’s invention as unpatentable. But on its face *Bilski* was no narrower than *State Street Bank*. The *State Street Bank* patent involved specialized machines²³⁶ and would almost certainly have been allowable under any reading of *Bilski*.²³⁷

More importantly, *Bilski*’s eventual effect on the law—and whether it would eventually turn into an inflationary precedent—depended on one crucial question left open by the Federal Circuit’s opinion: could a general purpose computer satisfy the “machine” prong of the test, or must the machine be specially adapted to the claimed process in some fashion? For *Bilski*, the question was irrelevant—his patent claimed no computer whatsoever.²³⁸ For the inventor in *State Street Bank* the question would have been irrelevant as

231. See David S. Olson, *Taking the Utilitarian Basis for Patent Law Seriously: The Case for Restricting Patentable Subject Matter*, 82 TEMP. L. REV. 181, 235 n.242 (2009) (describing *Bilski*’s business method as “obvious”); Dennis Crouch, *Bilski: Full CAFC To Reexamine the Scope of Subject Matter Patentability*, PATENTLY-O (Feb. 15, 2008, 11:55 PM), <http://www.patentlyo.com/patent/2008/02/bilski-full-caf.html> (“[T]his case looks problematic because of serious obviousness problems.”).

232. Cf. *In re Comiskey*, 499 F.3d 1365 (Fed. Cir. 2007) (holding that the PTO must consider patentable subject matter questions under Section 101 before turning to other issues).

233. *In re Bilski*, 545 F.3d 943, 963 (Fed. Cir. 2008) (en banc), *rev’d sub nom. Bilski v. Kappos*, 130 S. Ct. 3218 (2010).

234. *Id.* at 956 (quoting *Parker v. Flook*, 437 U.S. 584, 589 n.9 (1978)).

235. *Id.* at 964-65.

236. *State St. Bank & Trust Co. v. Signature Fin. Grp., Inc.*, 149 F.3d 1368, 1371-72 (Fed. Cir. 1998) (referencing U.S. Patent No. 5,193,056 (filed Mar. 1, 1991)). It is in this sense that *Bilski* represents, at minimum, a continuation of the *State Street Bank* regime.

237. See *supra* note 228 and text following. It is worth noting that when *Bilski* reached the Supreme Court, the government argued that upholding the Federal Circuit’s ruling would not call *State Street Bank* into question. In the government’s view, there was no doubt that the *State Street Bank* invention would be patentable under the Federal Circuit’s machine-or-transformation test. See Transcript of Oral Argument at 41-42, *Bilski v. Kappos*, 130 S. Ct. 3218 (2010) (No. 08-964), available at http://www.supremecourt.gov/oral_arguments/argument_transcripts/08-964.pdf.

238. See *Bilski*, 545 F.3d at 949; U.S. Patent Application No. 08/833,892, *supra* note 209.

well—the *State Street Bank* patent would have been allowed regardless.²³⁹ But for many other inventors, this question was decisive. Every software invention requires a computer to run, and most modern business methods and tax patents cannot be practiced without a computer of some sort as well.²⁴⁰ These computers are rarely specialized to the task at hand; by and large, a standard personal computer will suffice.²⁴¹ If *Bilski* were interpreted to require only a general computer, most of these patents would remain valid, and it would be easy for inventors to draft valid, enforceable claims going forward. If a more specialized type of machine were necessary, however, *Bilski* might only allow a much narrower range of patents.

C. The PTO's Response

The issue of general purpose computers was thus left to the PTO. Initially, the PTO took the position that a process claim must include “a particular machine” to be valid.²⁴² The PTO rejected a number of patents on the ground that “[a]ny and all computing systems will suffice [under the terms of the claim], indicating that the claim is not directed to the function of any particular machine.”²⁴³ Through the middle of 2009, approximately six months after the Federal Circuit handed down *Bilski*, the PTO held to the view that general purpose computers did not qualify as “machines” under governing Federal Circuit law.²⁴⁴

239. See *supra* note 237.

240. See, e.g., Jason Pill, Note, *What's So Great About SOGRAT?: An Analysis of the Ethical Issues Created by Tax Patents and a Patently Strict Dilemma*, 20 U. FLA. J.L. & PUB. POL'Y 147, 160 (2009) (“The complex permutations and calculations claimed in many tax patents rel[y] on quick and accurate calculations that only modern computers can perform.”); Matthew Moore, iBrief, *In re Bilski and the “Machine-or-Transformation” Test: Receding Boundaries for Patent-Eligible Subject Matter*, 2010 DUKE L. & TECH. REV. 005, ¶ 30 (“After all, many business methods are inextricably intertwined with computers and software.”).

241. It is worth noting again that the patent in *State Street Bank* would likely have been valid under either interpretation. That patent claimed a relatively specific sort of computer with structures oriented particularly toward the invention's purpose. *State St. Bank*, 149 F.3d at 1370-72 (describing the patent claims).

242. *Ex parte* Langemyr, No. 2008-1495, 2008 WL 5206740, at *13 (B.P.A.I. May 28, 2008), available at <http://www.uspto.gov/ip/boards/bpai/decisions/inform/fdo81495.pdf>.

243. *Id.* at *11; see also *Ex parte* Wasynczuk, No. 2008-1496, 2008 WL 2262377, at *12 (B.P.A.I. June 8, 2008), available at <http://www.uspto.gov/ip/boards/bpai/decisions/inform/fdo81496.pdf>; MERGES & DUFFY, *supra* note 204, at 43.

244. See sources cited *supra* note 243; see also *Ex parte* Cornea-Hasegan, No. 2008-4742, 2009 WL 86725 (B.P.A.I. Jan. 13, 2009), available at <http://des.uspto.gov/Foia/ReterivePdf?system=BPAI&fINm=fd20084742-01-13-2009-1> (refusing to grant a patent on similar grounds).

However, in July of 2009, the PTO shifted its stance.²⁴⁵ In *Ex parte Dickerson*, it granted a patent on a “computerized method” of optimizing business performance.²⁴⁶ The Agency argued that the invention “include[s] a step of outputting information from a computer . . . and therefore, [is] tied to a particular machine or apparatus.”²⁴⁷ The machine in *Dickerson* was not at all particular: the claims called only for a general-purpose computer.²⁴⁸ (The PTO’s reversal did not go unnoticed; even the chief judge of the Federal Circuit observed that the PTO had taken “inconsistent approaches” to the issue of general purpose computers since *Bilski*.²⁴⁹) The PTO has hewn to this permissive view of general-purpose computers ever since *Dickerson*.

The PTO’s behavior in the wake of *Bilski* was predictable and consistent with the model developed above—just like its behavior before *State Street Bank*. The initial rulings in which the PTO demanded “particular” machines, rather than merely general computers, may well have been the PTO’s best guess as to how the Federal Circuit would decide the issue. Yet the Agency was not content to continue with that approach. The PTO had nothing to gain and quite a bit to lose if it attempted to hold the line against inventions that the Federal Circuit might eventually accept. Faced with uncertain law, it elected to err on the side of granting patents, rather than denying them.²⁵⁰ The PTO found itself pushing the legal frontier without a clear signal from the Federal Circuit.

The result of the PTO’s actions will be a proliferation of software, tax, and business method patents involving only a general purpose computer. In most cases this is a trivial additional limitation to an invention, and one that should not greatly inhibit inventors from obtaining and enforcing valuable patents.

245. The PTO’s shift might have been due in part to the fact that the Supreme Court granted certiorari in *Bilski* the previous month. See *Bilski v. Doll*, 129 S. Ct. 2735 (2009) (mem.). At the time, it seemed highly unlikely that the Supreme Court would hold that *Bilski*’s invention involved patentable subject matter, and indeed the Court affirmed the Federal Circuit on that point. *Bilski v. Kappos*, 130 S. Ct. 3218, 3226–28 (2010). But the mere fact of the grant of certiorari might have introduced enough uncertainty to persuade the PTO to err on the side of caution.

246. No. 2009-001172, 2009 WL 2007184, at *1 (B.P.A.I. July 9, 2009), available at <http://des.uspto.gov/Foia/ReterivePdf?system=BPAI&flNm=fd2009001172-07-09-2009-1>.

247. *Id.* at *8; see also MERGES & DUFFY, *supra* note 204, at 44.

248. *Dickerson*, 2009 WL 2007184, at *4.

249. Tony Dutra, *Chief Judge Michel Says Commentary Reading Too Much into Bilski Opinion*, 78 Pat. Trademark & Copyright J. (BNA) 373 (2009); see also MERGES & DUFFY, *supra* note 204, at 44.

250. See *Dickerson*, 2009 WL 2007184, at *6.

Had the Federal Circuit's *Bilski* decision remained in force, and had the PTO continued to grant patents on processes attached to general computers, the cases finding their way to the Federal Circuit would likely have involved inventions that challenged the frontiers of patentability even more directly. The Federal Circuit would have seen few patents involving general computers, most of which the PTO would simply have granted. Rather, PTO denials might have involved even more general sorts of machines, or business methods that did not require machines but claimed to transform matter in some fashion. Over time, one might have expected to see the boundaries of patentability advance once again.

Of course, the Federal Circuit's *Bilski* decision did not stand long. The Supreme Court granted certiorari²⁵¹ and announced that the Federal Circuit could not treat the machine-or-transformation test as entirely determinative of whether an invention involved patentable subject matter.²⁵² While that test might be "a useful and important clue,"²⁵³ the true test for patentable subject matter is whether an invention is merely an "abstract idea" or something more.²⁵⁴ The Court's intervention was not surprising, given the theory presented here. The Supreme Court is not subject to the same inflationary pressures as the Federal Circuit, and it was likely reacting to the expansion in the law produced by the Federal Circuit and PTO.

The patentable subject matter rules have thus returned to a state of substantial uncertainty,²⁵⁵ and it will remain for the Federal Circuit to sort out the law's particularities in the years to come.²⁵⁶ As the PTO reacts to new rules, it will likely send the Federal Circuit an ever-advancing wave of boundary-pushing patent denials, primed for conversion into new, inflationary law.

251. *Bilski v. Doll*, 129 S. Ct. 2735 (2009).

252. *Bilski v. Kappos*, 130 S. Ct. 3218, 3226-28 (2010).

253. *Id.* at 3227.

254. *Id.* at 3225 (quoting *Diamond v. Chakrabarty*, 447 U.S. 303, 309 (1980)) (enumerating types of unpatentable subject matter).

255. This is not even to speak of the jurisprudence on patenting isolated molecules and other products derived from nature. That is an entirely separate strand of law, and one beyond the scope of the short case study presented here. See *Ass'n for Molecular Pathology v. U.S. PTO*, 653 F.3d 1329 (Fed. Cir. 2011) (upholding a patent on a purified DNA sequence).

256. That process has already begun, in halting, conflicted fashion. Compare *Ultramercial, LLC v. Hulu, LLC*, 657 F.3d 1323 (Fed. Cir. 2011) (holding that a particular method of internet advertising involving only general purpose computers, software, and the internet constitutes patentable subject matter), with *Cybersource Corp. v. Retail Decisions, Inc.*, 654 F.3d 1366 (Fed. Cir. 2011) (holding that a particular method for verifying internet credit card transactions involving software, the internet, and a "computer readable medium" did not constitute patentable subject matter).

CONCLUSION

In recent years the Patent and Trademark Office and the Federal Circuit have been widely criticized for their poor stewardship of the patent system. The PTO grants significant numbers of invalid patents, while the Federal Circuit has radically expanded the boundaries of what can be patented. These problems have been attributed to a variety of causes, including mismanagement and underfunding at the PTO, a lack of expertise, interest-group capture, and an ideological preference in favor of extensive patenting. Each of these factors may be responsible to some degree. But the problems that plague patent law can be explained without reference to any of these factors, and the problems could well persist even if all of these other potential causes are addressed. The PTO's interest in avoiding appeals and reversals, coupled with the Federal Circuit's asymmetric review of PTO decisions, are themselves enough to generate a surplus of invalid patents and an inflationary patent law. The patent system's dysfunction could be in part a consequence of the relationship between the PTO and Federal Circuit. Accordingly, policymakers should seek institutional remedies to what is fundamentally an institutional problem.

Finally, there is no reason to believe that these inflationary effects are necessarily confined to patents.²⁵⁷ Asymmetric rights of appeal—or asymmetric rates of appeal—could be driving inflation across a range of other administrative fields,²⁵⁸ or even in civil litigation more generally.²⁵⁹ These effects may be much more muted, or they may be dwarfed by broader technical or ideological shifts in the law. For instance, if administrative decisionmakers—immigration judges, for instance—are driven more by ideological concerns than by the desire to avoid appeals and reversals, they will not necessarily send

257. See *supra* notes 16-22 and accompanying text.

258. For instance, there is evidence that the administrative law judges charged with adjudicating Social Security disability claims have become more and more permissive over time. See generally Richard J. Pierce, Jr., *What Should We Do About Administrative Law Judge Disability Decisionmaking?* 5 (unpublished manuscript 2011), <http://ssrn.com/abstract=1890770> (“Both the average [Administrative Law Judge] grant rate and the distribution of [Administrative Law Judge] grant rates have increased dramatically over the last three decades.”). This development could be attributable, at least in part, to the asymmetric nature of appeals from Administrative Law Judges’ Social Security decisions. See *supra* note 19. I take no position on whether this is a beneficial or harmful development.

259. See Eduardo M. Peñalver & Lior Jacob Strahilevitz, *Judicial Takings or Due Process?*, 97 CORNELL L. REV. (forthcoming 2012), available at <http://ssrn.com/abstract=1791849> (describing such a mechanism in property law).

predominantly boundary-pushing cases to the courts of appeal.²⁶⁰ This could eliminate or reverse any inflationary pressure. Inflation is highly contextual, and further work is necessary to determine its effects in other legal domains. But the possibility exists that asymmetries in appeal exert pressure on legal boundaries even in disciplines far removed from patent law.

260. See Stephen H. Legomsky, *Restructuring Immigration Adjudication*, 59 DUKE L.J. 1635, 1665-75 (2010) (describing the increasing politicization of Immigration Judges within the Executive Office for Immigration Review).