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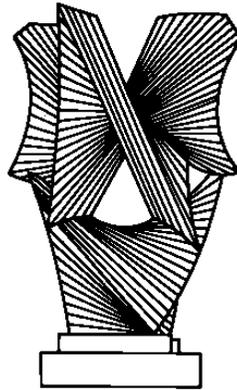
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PATENT INFLATION

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Patent Inflation

Jonathan Masur[†]

Introduction

The shape of patent law is defined in large degree by the interaction between its two main expositors: the Federal Circuit and the Patent and Trademark Office (“PTO”). Intervention from Congress and the Supreme Court comes rarely—Congress has not significantly modified the Patent Act in the past 50 years, and the Supreme Court has generally been reluctant to weigh in on many of the most significant patent questions. In their absence, the Federal Circuit and the PTO have arrived at an uneasy institutional *détente*. The Federal Circuit dictates the terms of substantive patent law to the patent office, which typically abides by those terms and works to placate both the Federal Circuit and the patent applicants who come before it.

Yet this structural accord has not well served the patent system or the private parties who rely on it. In recent years both the Patent and Trademark Office and the Federal Circuit have received trenchant criticism for their handling (and mishandling) of patent applications and patent cases. Critics have leveled two particular charges: first, that the PTO grants too many invalid patents; and second, that the Federal Circuit has presided over a dramatic (and unwarranted) expansion of what may be patented.¹ These failures have been chalked up to a number of potential causes: 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 over a broader range of technologies.²

It is entirely possible that these various factors, singly and in combination, have contributed to the significant numbers of invalid patents and the expansion in patentability. Yet this article intends to offer a different and novel explanation. These types of patent dysfunction—an overly permissive PTO, and an overly expansive Federal Circuit—may simply be the results of the contorted institutional relationship between the two organizations. 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 may be engaged in an unwitting expansion of the boundaries of patent law.

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 private party may appeal immediately to the Federal Circuit. When the PTO grants a patent, however, there is no losing party to appeal—the victorious applicant merely walks away with its patent. That patent is unlikely ever

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¹ See *infra* notes 7-10 and accompanying text.

² See *infra* notes 11-15 and accompanying text.

to see the inside of a courtroom, given how few infringement lawsuits are litigated, and at minimum it will be many years before it does. If the PTO wishes to avoid lawsuits, it need only err on the side of allowing excessive numbers of patents, even invalid patents. A preponderance of the cases that reach the Federal Circuit will thus involve inventions that are unpatentable under governing law. These cases will offer the Federal Circuit the opportunity to either reject the patent under existing law, preserving the law as it stands, or grant the patent under a new, more expansive understanding of what is patentable. If the Federal Circuit decides any of these cases in favor of the applicant, the boundaries of patentability will expand. The result will be subject a natural inflationary pressure generated entirely by the types of cases that the PTO sends to the Federal Circuit.

Despite the apparent complexity of these effects, they rely on only three apparently 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; and third, appeal from a PTO decision may be taken only by an aggrieved applicant whose patent has been denied. Using only those three institutional features of the patent system, this article builds a model of the interaction between the PTO, Federal Circuit, and patent applicants that generates improperly granted patents and an inexorable expansion of the frontiers of patent law.

The interaction between the PTO and the Federal Circuit—and the results it generates—are so remarkable because the asymmetry that generates them is so rare. Nearly every type of litigation or administrative proceeding produces winning and losing parties, either of whom can appeal to the federal courts (if appeal is available). This is of course true for civil and criminal trials, and it is true as well for essentially every federal administrative action, from the promulgation of major regulations³ to individual funding⁴ or permitting decisions.⁵ The patent system thus stands nearly alone, with potentially significant consequences for patentees and consumers alike.

The 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 Federal Circuit, beginning with a simple model and building toward a nuanced description that incorporates the characteristics and motivations of the individuals in charge of those institutions. Part III presents a case study of the relationship

³ *E.g.*, *Chevron, Inc. v. Natural Resources Defense Council*, 467 U.S. 837 (1984) (challenge to EPA regulation creating a “bubble rule” for new sources of pollution).

⁴ *E.g.*, *Citizens to Preserve Overton Park, Inc. v. Volpe*, 401 U.S. 402 (1971) (citizen suit to block Secretary of Transportation from releasing highway construction funds).

⁵ *E.g.*, *Carolina Environmental Study Group v. U.S.*, 510 F.2d 796 (D.C. Cir. 1975) (third-party challenge to Atomic Energy Commission order granting permission to construct two new nuclear reactors). Indeed, it appears that there are only two other administrative systems in which an aggrieved individual may appeal an adverse decision by the government but neither the government nor a third party may appeal a decision favorable to the individual: claims before the Social Security Administration for Supplemental Security Income or Social Security Disability Insurance, *see* 42 U.S.C. § 405 (procedural rules for SSI/SSDI claims), and decisions by immigration law judges regarding removal and asylum. *See* 8 U.S.C. § 1158 (procedural rules for appeals from decisions by immigration judges).

between the PTO and Federal Circuit involving the evolving rules regarding the patentability of software and business methods that culminated in the Supreme Court's recent decision in *Bilski*.

I. Patent Problems

There is by now a broad consensus that the United States patent system is rife with flaws and inadequacies.⁶ The “patent crisis,” as more than one commentator has termed it,⁷ has become so severe that in many cases patents are now believed to retard innovation more than they promote it.⁸ Critics of the patent system have pointed to two particular problems. First, the PTO does a poor job of examining patents, allowing far too many invalid patents to issue.⁹ Second, the Federal Circuit has pushed the law in an excessively pro-patent direction, broadening the scope of patentable subject matter and endowing patentees with unwarranted power.¹⁰

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.¹¹ Others have argued that the PTO is hamstrung by poor management.¹² 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.¹³ Others allege that the PTO and the

⁶ 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); ADAM B. JAFFE & JOSH LERNER, *INNOVATION AND ITS DISCONTENTS* (2004).

⁷ See, e.g., Burk & Lemley, *supra* note 6 (starting from the premise that a crisis exists within the patent system); Beth Simone Noveck, “Peer to Patent”: *Collective Intelligence, Open Review, and Patent Reform*, 20 Harv. J.L. & Tech. 123 (2006) (describing a patent crisis in high-technology fields); 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”); Nat'l Academies of Sci., *A Patent System for the 21st Century* (2004) (same); U.S. Fed. Trade Comm'n, *To Promote Innovation: The Proper Balance of Competition and Patent Law and Policy* ch. 3 (2003) (same).

⁸ See Bessen & Meurer, *supra* note 6, at 124 (arguing that biotechnology is the *only* field in which patents increase innovation).

⁹ E.g., 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 (1999); Mark A. Lemley, *Rational Ignorance at the Patent Office*, 95 NW. L. REV. 1495 (2001); JAFFE & LERNER, *supra* note 6, at 32-33 (2004); Michael A. Heller & Rebecca S. Eisenberg, *Can Patents Deter Innovation? The Anticommons in Biomedical Research*, 280 SCIENCE 698 (1998) (analyzing the negative effects of a crowded patent field on innovation and market entrance); Doug Lichtman & Mark A. Lemley, *Rethinking Patent Law's Presumption Of Validity*, 60 Stan. L. Rev. 45 (2007); Michael J. Meurer, *Patent Examination Priorities*, 51 Wm. & Mary L. Rev. 675 (2009); Mark Lemley, Douglas Lichtman, & Bhaven Sampat, *What to do About Bad Patents?*, 28 REGULATION 12-13 (2005) (describing the problems generated by substantial numbers of invalid patents).

¹⁰ E.g., Jaffe & Lerner, *supra* note 6, at 36; Fed. Trade Comm'n, *To Promote Innovation: The Proper Balance of Competition and Patent Law and Policy* 5 (2003), available at <http://www.ftc.gov/os/2003/10/innovationrpt.pdf>; Jay Dratler, Jr., *Alice in Wonderland Meets the U.S. Patent System*, 38 Akron L. Rev. 299 (2005).

¹¹ E.g., Arti K. Rai, *Growing Pains in the Administrative State: The Patent Office's Troubled Quest for Managerial Control*, 157 U. Pa. L. Rev. 2051 (2009); Rochell Dreyfuss, *Pathological Patenting: The PTO as Cause or Cure*, 104 MICH. L. REV. 1559, 1562 (2006); Jaffe & Lerner, *supra* note 6, at 124; Lemley, *supra* note 9, at 1508 (noting the negative effects of funding shortages).

¹² E.g., Jaffe & Lerner, *supra* note 6, at 42; Rai, *supra* note 11, at 2062; Stuart Minor Benjamin & Arti K. Rai, *Fixing Innovation Policy: A Structural Perspective*, 77 Geo. Wash. L. Rev. 1 (2008); Lichtman & Lemley, *supra* note 9, at 60.

¹³ E.g., R. Polk Wagner & Lee Petherbridge, *Is the Federal Circuit Succeeding? An Empirical Assessment of Judicial Performance*, 152 U. PENN. L. REV. 1105 (2004) (finding that the Federal Circuit has been only mildly

Federal Circuit have been captured by private, pro-patent interests.¹⁴ 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.¹⁵

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.¹⁶ They raise search costs for market entrants, who 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.¹⁷ Invalid patents can also hamper a firm's ability to raise capital¹⁸ or write contracts with potential customers.¹⁹ 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

successful in promulgating a coherent and predictable doctrine of claim construction); 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); 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, 60-61 (2000) (same); Dreyfuss, *supra* note 11, at 1565 (noting that the PTO does not have economists and other experts on staff).

¹⁴ *E.g.*, Dreyfus, *supra* note 11; Dan L. Burk & Mark A. Lemley, *The Patent Crisis and How the Courts Can Solve It* 106-07 (2009) (arguing that the PTO is subject to capture); R. Polk Wagner, *Understanding Patent Quality Mechanisms* 25 (Jan. 6, 2009), <http://www.ftc.gov/bc/workshops/ipmarketplace/apr17/docs/rwagner2.pdf> (suggesting the influence that repeat players can have on PTO behavior); Meurer, *supra* note 9, at 686 (same); Clarissa Long, *The PTO and the Market for Influence in Patent Law*, 157 U. Penn. L. Rev. 1965 (2009) (suggesting that the PTO has invited capture in order to increase its own stature); 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). *But see* John M. Golden, *The Supreme Court as "Prime Percolator": A Suggestion 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).

¹⁵ *E.g.*, Jaffe & Lerner, *supra* note 6, at 137; Bessen & Meurer, *supra* note 6, at 69 (suggesting that the Federal Circuit has been "pro-patent"); 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").

¹⁶ *See* Ian Ayres & Paul Klemperer, *Limiting Patentees' Market Power Without Reducing Innovation Incentives: The Perverse Benefits of Uncertainty and Non-Injunctive Remedies*, 97 Mich. L. Rev. 985, 1018-20 (1999); Michael A. Heller & Rebecca S. Eisenberg, *Can Patents Deter Innovation? The Anticommons in Biomedical Research*, 280 SCIENCE 698 (1998) (analyzing the negative effects of a crowded patent field on innovation and market entrance); Christopher R. Leslie, *The Anticompetitive Effects of Unenforced Invalid Patents*, 91 Minn. L. Rev. 101 (2006) (analyzing the harm that even unenforced patents can do to competitors and consumers within the marketplace).

¹⁷ *See id.* at 132-37; Ian Ayres & Gideon Parchomovsky, *Tradable Patent Rights to Innovation*, 60 Stan. L. Rev. 863, 870-81 (2007); *Knorr-Bremse Systeme Fuer Nutzfahrzeuge GmbH v. Dana Corp.*, 383 F.3d 1337, 1344-47 (Fed. Cir. 2004); MERGES & DUFFY, *supra* note 13, at 615-616 (describing the economics of search costs).

¹⁸ *See* Fed. Trade Comm'n, *To Promote Innovation: The Proper Balance of Competition and Patent Law and Policy*, ch. 2, at 8 (2003) ("The threat of being sued for infringement by an incumbent [patent holder]—even on a meritless claim—may 'scare . . . away' venture capital financing.") (quoting testimony of Professor Joshua Lerner, Opening Statement, *available at* <http://www.ftc.gov/opp/intellect/lernerjosh.pdf>).

¹⁹ Leslie, *supra* note 16, at 125-27.

resist relying upon suppliers who may be shut down or driven out of the market by a lawsuit.²⁰ Finally, invalid patents raise licensing and litigation costs.²¹

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.²² 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 they impose upon consumers.²³

In response to the inadequacies of the patent office and Federal Circuit, and 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.²⁴ Others have suggested that patent examinations should be eliminated altogether, with patent examination reverting to a simple system of registration akin to the copyright regime.²⁵ Still others have argued that the problems should be left to the federal courts to sort out.²⁶

Many of these proposals have been coupled with suggestions for meaningful inter partes post-grant administrative review, mechanisms by which potential infringers can challenge a patent’s validity without undertaking expensive litigation in federal courts.²⁷ Some scholars recommend a multi-tiered system of patent review in which applicants can opt for one of several

²⁰ 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.”).

²¹ See Michael J. Meurer, *Controlling Opportunistic and Anticompetitive Intellectual Property Litigation*, 44 B.C. L. Rev. 509, 515 (2003); *Bresnick v. U.S. Vitamin Corp.*, 139 F.2d 239, 242 (2d Cir. 1943) (Hand, J.) (describing a patent as a “scarecrow” that can deter competition by its very existence).

²² Ayres & Parchomovsky, *supra* note 17, at 867; see also 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.”); 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.”); DONALD S. CHISUM ET AL., *PRINCIPLES OF PATENT LAW* 6 (1998); ROBERT PATRICK MERGES & JOHN FITZGERALD DUFFY, *PATENT LAW AND POLICY: CASES AND MATERIALS* 253–256 (2007) (describing the incentive systems meant to drive the patent law).

²³ Gideon Parchomovsky, *Towards an Integrated Theory of Intellectual Property*, 88 Va. L. Rev. 1455, 1471 (2002) (suggesting the limits at which the losses due to static inefficiency outweigh the gains in dynamic efficiency).

²⁴ See, e.g., Shubha Ghosh & Jay Kesan, *What do Patents Purchase? In Search of Optimal Ignorance in the Patent Office*, 40 HOUS. L. REV. 1219 (2004); Jaffe & Lerner, *supra* note 6 (proposing that the patent office expend greater funds on more rigorous examination); Lemley et al., *supra* note 9, at 12–13; John R. Allison, *On the Feasibility of Improving Patent Quality One Technology at a Time: The Case of Business Methods*, 21 BERKELEY TECH. L. J. 729 (2006); H.R. 1908, 110th Cong. (2007).

²⁵ Adam Mossoff, *Who Cares What Thomas Jefferson Thought About Patents? Reevaluating the Patent Privilege in Historical Context*, 92 CORNELL L. REV. 953 (2007); 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).

²⁶ BURK & LEMLEY, *supra* note 6, at 112-15; Lemley, *supra* note 9, at 1508–11 (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).

²⁷ See, e.g., 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); Jaffe & Lerner, *supra* note 6, at 176.

levels of PTO scrutiny with correspondingly strong ex post presumptions of validity.²⁸ 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,²⁹ or even private competition in the market for patent examination.³⁰ 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.³¹

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 ideology³²—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. This 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.³³ Third, if the PTO denies the patent, the applicant decides whether to appeal that denial to the Federal Circuit.³⁴ And fourth, the Federal Circuit decides the appeal (if there is one).

²⁸ See, e.g., Lemley et al., *supra* note 9, at 12–13; Kristen Osenga, Entrance Ramps, Tolls, and Express Lanes—Proposals for Decreasing Congestion in the Patent Office, 33 FLA. ST. L. REV. 119 (2005).

²⁹ Ayres & Parchomovsky, *supra* note 17, at 870. *But see* Abramowicz, *supra* note 22, at 815 (arguing that the government is ill-suited to determining when patent auctions should be held).

³⁰ Michael Abramowicz & John F. Duffy, *Ending the Patenting Monopoly*, 157 U. Penn. L. Rev. 1541 (2009) (suggesting that private patent examination firms be allowed to compete with the USPTO).

³¹ E.g., Rochelle Cooper Dreyfuss, In Search of Institutional Identity: The Federal Circuit Comes of Age, 23 Berkeley Tech. L.J. 787, 804 (2008) (“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.”).

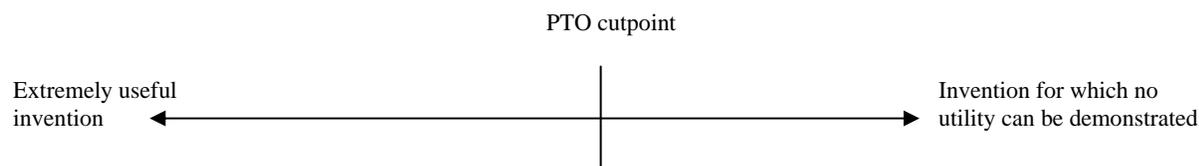
³² See *supra* notes 11-15 and accompanying text.

³³ Craig Allen Nard, *Deference, Defiance, and the Useful Arts*, 56 Ohio St. L.J. 1415 (1995) (explaining the legal relationship between the PTO and Federal Circuit).

³⁴ To be precise, inventors whose patents rejected by the PTO examiner may appeal to the Board of Patent Appeals and Interferences (BPAI), an administrative court located within the PTO. See 35 U.S.C. § 6(b) (“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* (unpublished manuscript 2008), available at http://www.ssrn.com/abstract_id=1128311. As later sections will explain, however, the BPAI is under the control of the top PTO administrators and functions as an arm of the agency. See *infra* note 73. Because these administrators control all significant decision-makers 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.

Following attitudinal models of judging, which describe judges as having an “ideal point”³⁵—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.³⁶ That is, along any given dimension of patentability (utility, nonobviousness, 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 non-patentability.³⁷ These cutpoints can be represented graphically. For instance, Figure 1 below displays a hypothetical PTO cutpoint on the issue of utility:

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 have obvious and incontrovertible demonstrated utility; 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 or permissive would be that actor’s standards for patentability.

There are of course many different dimensions to patentability. A patent must recite valid subject matter,³⁸ must be novel and nonobvious,³⁹ must be useful,⁴⁰ and so forth. 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 itself has a cutpoint that represents what 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:

³⁵ *E.g.*, Jeffrey A. Segal & Albert D. Cover, Ideological Values and the Votes of U.S. Supreme Court Justices, 83 Am. Pol. Sci. Rev. 557 (1989)

³⁶ Pauline T. Kim, Deliberation and Strategy On the United States Courts Of Appeals: An Empirical Exploration of Panel Effects, 157 U. Penn. L. Rev. 1319, 1347 (2009); 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); Nicola Gennaioli & Andrei Shleifer, Judicial Fact Discretion, 37 J. Legal Stud. 1, 18-20 (2008) (employing an ideal point-based model)

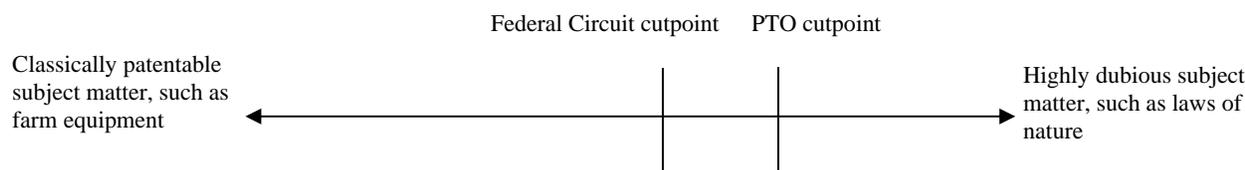
³⁷ Lee Epstein, Andrew D. Martin, Kevin M. Quinn & Jeffrey A. Segal, Ideological Drift Among Supreme Court Justices: Who, When, And How Important?, 101 Nw. U. L. Rev. 1483, 1529-30 (2007) (describing the lines demarcating decisions between voting one way or the other on a case as cutpoints); Keith Krehbiel, Committee Power, Leadership, and the Median Voter: Evidence From the Smoking Ban, 12 J.L. Econ. & Org. 234, 253 (1996) (employing a cutpoint-based model).

³⁸ *E.g.*, *Diamond v. Chakrabarty*, 447 U.S. 303 (1980) (patentability of living organism).

³⁹ *KSR Intern. Co. v. Teleflex Inc.*, 550 U.S. 398 (2007) (obviousness); *In re Robertson*, 169 F.3d 743 (Fed. Cir. 1999) (novelty).

⁴⁰ *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).

Figure 2: PTO and Federal Circuit Cutpoints on Patentable Subject Matter



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 on occasion, purely as a matter of error or internal disagreements within an institution.⁴¹ This is merely to establish the basic building blocks of the model. Later sections drop the assumption of perfect accuracy and present a 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 that determine whether an application is patentable. Nonetheless, it is entirely generalizable to any number of dimensions—what is true for one dimension will be true for all of them.

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 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,⁴² and sometimes

⁴¹ For instance, some judges of 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.

⁴² 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.

denying patents that should be granted.⁴³ 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.⁴⁴ 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 in General



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

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.⁴⁵ 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.⁴⁶ Only PTO actions on one side of the ledger are appealed directly to the federal courts.⁴⁷ Strategic patent applicants will thus understand that

⁴³ 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.

⁴⁴ This is the standard, intuitive assumption that drives all spatial models. *See supra* notes 36-37 and sources cited therein.

⁴⁵ 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.

⁴⁶ 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.

⁴⁷ That is not to say that improperly granted patents never wind up in federal court. They do, in the context of infringement actions. Yet they arrive there in smaller numbers, and after greater delay, than patents based on applications denied. The next section explores this issue in greater detail.

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.⁴⁸

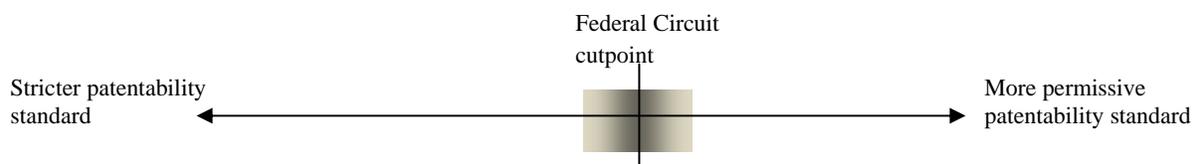
Under these circumstances, if the costs of appealing the Federal Circuit are low enough, few patents will be improperly denied: any applicant whose patent is wrongly denied can simply appeal, and the Federal Circuit will grant the patent. However, some number of invalid patents will be improperly granted 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.⁴⁹

C. A Perfect PTO, An 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 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 to ascertaining the patentability of an invention; even experienced judges will frequently make legal errors.⁵⁰ 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

⁴⁸ See Jonathan S. Masur, *Costly Screens, Value Asymmetries, and Examination at the PTO*, *Journal of Legal Analysis* (forthcoming 2010), at 14 (cataloguing the costs involved in obtaining a patent).

⁴⁹ See *supra* note 8 and sources cited therein.

⁵⁰ David L. Schwartz, *Practice Makes Perfect? An Empirical Study of Claim Construction Reversal Rates in Patent Cases*, 107 *Mich. L. Rev.* 223 (2008). In addition, Federal Circuit judges may be experienced, but they are not particularly expert. See *supra* note 13 and sources cited therein.

judge—the judge who holds the deciding vote in en banc cases.⁵¹ But other judges may have more or less expansive views of the scope of patentability than the median judge.⁵² 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.⁵³

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.⁵⁴ On the other hand, circuit precedent is not entirely binding; judges do deviate from precedent on regular occasions, especially in the Federal Circuit, where inconsistent, competing legal approaches often persist for years.⁵⁵ In keeping with standard legal and political science models of judicial behavior, the model assumes 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.⁵⁶ 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.⁵⁷ 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.⁵⁸

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 a favorable (or errant) panel that will overturn the PTO's decision and grant the patent. The number of such patentees who file for patents on unpatentable inventions will depend on the costs and benefits involved: the cost of applying for a

⁵¹ See William H. Riker, *The Theory of Political Coalitions* (1962); Lee Epstein & Tonja Jacobi, *Super Medians*, 61 *Stan. L. Rev.* 37, 44-49 (2008); 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.”).

⁵² See Lee Petherbridge, *Patent Law Uniformity*, 22 *Harv. J.L. & Tech.* 421, 446-48 (2009) (finding substantial differences in outcomes among judges).

⁵³ See Joshua B. Fischman, *Estimating Preferences of Appellate Judges: A Model of “Consensus Voting,”* available at http://papers.ssrn.com/sol3/papers.cfm?abstract_id=1361348 (unpublished manuscript 2010).

⁵⁴ W. Mark C. Weidemaier, *Toward A Theory of Precedent in Arbitration*, 51 *Wm. & Mary L. Rev.* 1895, 1926 (2010) (“precedent constrains the discretion of future decision makers to some meaningful degree”).

⁵⁵ See *infra* notes 68-70 and accompanying text (describing the intra-circuit conflict over the proper methodology of patent claim construction).

⁵⁶ This approach is drawn from spatial voting models and has gained wide acceptance. See, e.g., Kim, *supra* note 36, at 1347 (using a spatial model to analyze judicial voting); Jonathan Bendor & Adam Meirowitz, *Spatial Models of Delegation*, 98 *Am. Pol. Sci. Rev.* 293 (2004) (employing a spatial model to explain delegation decisions); 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* (Inst. of Governmental Studies, Working Paper No. 2005-12, 2005) (analyzing European voting with a spatial model).

⁵⁷ 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).

⁵⁸ Kim, *supra* note 36, at 1347-50.

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 may be few of these patentees (depending on these parameters), but there will not be zero. In other words, this institutional arrangement will in the end 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 only two options: *a*) affirm the patent office's denial, or *b*) reverse the PTO and grant the patent. If the Federal Circuit affirms the PTO, it will likely do so based on governing circuit precedent, which of course the PTO followed.⁵⁹ 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.⁶⁰ If the Federal Circuit has simply misjudged the invention's technology or misapplied the law, the precedent will likely have little value.⁶¹ But where the Federal Circuit offers a new statement of law, the new precedent will exert force.⁶² 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. (Again, the PTO is bound to enforce the Patent Act, as interpreted by the Federal Circuit.⁶³) Every time the Federal Circuit moves the law, the PTO will respond accordingly and become 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

⁵⁹ 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.

⁶⁰ It is well beyond the scope of this paper to elucidate an entire theory of precedent; instead, I rely here upon standard existing theories of how precedent impacts judicial behavior. See, e.g., Frederick Schauer, *Precedent*, 39 Stan. L. Rev. 571 (1987); Paul H. Rubin, *Why is the Common Law Efficient?*, 6 J. Leg. Stud. 51 (1977) (criticizing the notion that the common law evolves toward efficiency and offering a more realistic account of judicial behavior).

⁶¹ See *id.* at 591-96 (explaining that precedent will be of little value when it covers only a very narrow category of cases).

⁶² See *id.* at 592-95 (categorizing the strength of legal precedents).

⁶³ Nard, *supra* note 33, at 1432 (describing the PTO's obligation to enforce the Federal Circuit's version of the law).

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.⁶⁴ Only the court sitting en banc may do so.⁶⁵ 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.⁶⁶ These new panel opinions then exert precedential force of their own in future cases, even cases that the Federal Circuit hears en banc.⁶⁷ In addition, the Federal Circuit is infamous for allowing apparently contradictory panel opinions to co-exist for extended periods of time. For instance, for several years the circuit had two separate doctrines of claim interpretation.⁶⁸ Both stemmed from panel opinions,⁶⁹ and both claimed some number of adherents until the court, sitting en banc, discarded one in favor of the other.⁷⁰ 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 judges of the Federal Circuit to deviate from settled precedent in service of an outcome that they could achieve simply by adhering to that precedent.⁷¹

In addition, any patent 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

⁶⁴ 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.

Seventh Circuit Local Rule 40(e), available at <http://www.ca7.uscourts.gov/Rules/rules.htm>.

⁶⁵ Fed. Cir. Local Rule 35 (“Although only the court en banc may overrule a binding precedent . . .”), available at <http://www.cafc.uscourts.gov/images/stories/rules-of-practice/rules.pdf>.

⁶⁶ Schauer, *supra* note 60, at 589.

⁶⁷ *Id.*

⁶⁸ See Phillips v. AWH Corp., 415 F.3d 1303 (Fed. Cir. 2005) (explaining the history of the circuit’s rules on claim construction).

⁶⁹ One approach focused on the literal meaning of claim terms as interpreted using dictionaries, see Texas Digital Systems, Inc. v. Telegenix, Inc., 308 F.3d 1193 (Fed. Cir. 2002); the other employed a more holistic approach. See Vitronics Corp. v. Conceptronic, Inc., 90 F.3d 1576 (Fed. Cir. 1996).

⁷⁰ Phillips, 415 F.3d at 1312 (adopting the *Vitronics* approach).

⁷¹ 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).

existing law could provide the Federal Circuit with opportunities to dial back the reach of patentable subject matter.

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 hypothesis 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. 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. As a result, the overall 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 actual institutional bodies. This section takes up that task.

1. The PTO

This section begins with an account of what the Patent Office attempts to achieve when it examines patents. As described above, the PTO's official objective is to allow those patents that would be valid under the best possible interpretation of governing law.⁷² Officially, then, the PTO is expected to match its cutpoint to the Federal Circuit's. The patent system is designed such that the PTO's official goal is 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.⁷³ The patent rules are not the PTO's own legal boundaries—they

⁷² Nard, *supra* note 33, at 1419-22.

⁷³ 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 supra* note 34; 35 U.S.C. § 6(b) (establishing the BPAI). 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 Director, the

were created by the Federal Circuit.⁷⁴ Accordingly, there is no one at the PTO with any personal investment in the contours of the rules, or anyone who stands to reap any psychic or reputational benefits if the PTO holds fast to the patentability boundaries.⁷⁵ Nor is there any indication that PTO administrators are chosen based on their views of patent law and how those views accord with governing Federal Circuit precedent.⁷⁶ Adhering to the Federal Circuit's conception of patent law holds very 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 any administrative heads, top officials at the PTO are interested in maximizing both their future career prospects and, to a lesser extent, their leisure time.⁷⁷ Consider first the issue of an administrator's career. The administrator's future career opportunities are driven in large degree by her reputation.⁷⁸ Enhancing her own reputation

Commissioner for Patents, and the Commissioner for Trademarks, as well as administrative patent judges. 35 U.S.C. § 6(a). 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 and can be removed at will. *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 34, at 3 (quoting *In re Alappat*, 33 F.3d 1526, 1535 (Fed. Cir. 1994)). Moreover, before a decision of the BPAI acquires precedential force—before it can bind examiners or the BPAI itself in the future—that decision must be approved by the PTO Director. United States Patent and Trademark Office OG Notices: 23 January 2007, *Publication of Opinions of the Board of Patent Appeals and Interferences*, available at <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 Director. *Alappat*, 33 F.3d at 1535-36. But senior PTO administrators exert effective control the law that emanates from the BPAI (as well as the more quotidian activities of examiners). Accordingly, the analysis will treat the interests of the agency at large as mirroring those of its senior management.

⁷⁴ 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 in Part II.F., *infra*.

⁷⁵ See Richard A. Posner, *How Judges Think* 40-41 (2008) (describing the set of theories positing that decision-makers prefer to decide questions in accordance with views or ideas they have constructed).

⁷⁶ 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., President Obama Announces More Key Administration Posts, June 18, 2009, available at http://www.whitehouse.gov/the_press_office/President-Obama-Announces-More-Key-Administration-Posts-6-18-09/ (Obama statement regarding PTO Director David Kappos); 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, available at http://leahy.senate.gov/press/press_releases/release/?id=40766b3c-7fa3-4c74-986e-d4378ae4665c (statement by Senator Patrick Leahy, Chairman of the Senate Judiciary Committee, regarding Kappos).

⁷⁷ 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."); Michael A. Livermore, *Cause or Cure? Cost-Benefit Analysis and Regulatory Gridlock*, 17 N.Y.U. *Env'tl. 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).

⁷⁸ 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").

involves increasing the size, prestige, and resources of her administration,⁷⁹ on the theory that successfully managing an important organization demonstrates the administrator's ability.⁸⁰

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.⁸¹ However, in the net these parties do not appear to have terribly strong preferences regarding the substantive content of patent law. Congress and the President have not passed major legislation altering the structure of patent law since 1952, which indicates a willingness to cede the shaping of the law to the courts.⁸² Scholars believe that this political apathy is due to the fact that private interests are arrayed approximately equally for and against expansion in the scope of patent rights.⁸³ Notwithstanding this apparent equality, the PTO has assumed at least a public posture of solicitude towards patent applicants in general, the class of private actors most likely to prefer expansive patent scope.⁸⁴ The PTO refers to them as its "customers" and states that its mission is to serve their interests in obtaining patents.⁸⁵ In the aggregate, it is unlikely that Congress, the President, and private interests exert a strong pull on PTO behavior. But if they do, it is likely in the direction of allowing more extensive patenting.⁸⁶

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 place a high value on avoiding being reversed.⁸⁷ Reversals by the Federal Circuit are costly in reputational terms and can

⁷⁹ NISKANEN, *supra* note 77, 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"); Andre Blais and Stephane Dion, *The Budget-Maximizing Bureaucrat: Appraisals and Evidence* 6 (1991) ("strategies are mainly, but not exclusively targeted at budgetary increases").

⁸⁰ Randall L. Calvert et al., A Theory of Political Control and Agency Discretion, 33 Am. J. Poli. Sci. 588, 589-90 (1989); Mark Bagnoli & Michael McKee, Controlling the Game: Political Sponsors and Bureaus, 7 J.L. & Econ. Org. 229, 230 (1991).

⁸¹ NISKANEN, *supra* note 77, at 24 (1971) (describing administrators' desire to satisfy their financial sponsors); Long, *supra* note 14 (suggesting that the PTO will often enlist the assistance of private parties in lobbying Congress for additional funding).

⁸² *Id.* at 1968 ("Since 1952, Congress has not taken much interest in amending the patent code, leaving the bulk of legal evolution to the courts.").

⁸³ Clarisa Long, Institutions and Interest Groups in Patent and Copyright Law, at 10 (unpublished manuscript 2007).

⁸⁴ See *supra* note 9 (and sources cited therein).

⁸⁵ See, e.g., WORKING FOR OUR CUSTOMERS: A PATENT AND TRADEMARK OFFICE REVIEW (1994 Annual Review), available at <http://www.uspto.gov/web/offices/com/annual/1994/pg1-5.pdf>. This may of course be mere lip service.

⁸⁶ At the level of the individual examiner, there is a bias towards granting patent applications. Examiners receive bonuses based on how many applications they can process fully, JAFFE & LERNER, *supra* note 6, at 116, and the quickest and easiest way for them to finish processing an application is to allow the patent. *Id.* at 136; cf. John Bronsteen, *Against Summary Judgment* Geo. Wash. L. Rev. (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?* (unpublished manuscript), available at http://www.ssrn.com/abstract_id=1121132 (2008).

⁸⁷ Albert A. Foer, *The Politics of Antitrust in the United States: Public Choice and Public Choices*, 62 U Pitt L Rev 475, 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 maintain superior private-practice exit options); George A. Krause and James W. Douglas, *Institutional Design versus Reputational Effects on Bureaucratic Performance: Evidence from US*

threaten top officials' employment and public standing, not to mention their future employment prospects.⁸⁸ 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,⁸⁹ 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 non-material benefits to the PTO workforce.⁹⁰ Accordingly, even victorious appeals can reduce the leisure time available to the PTO administrator and her subordinates.⁹¹ The Patent Office thus has a strong incentive to avoid appeals, and in particular to avoid reversals.

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.⁹² 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.⁹³

Government Macroeconomic and Fiscal Projections, 15 J. Pub. Admin. Res. & Theory 281 (2005); cf. Hon. James P. Timony, *Performance Evaluation of Federal Administrative Law Judges*, 7 Admin L.J. 629, 656-57 (1993) (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.”).

⁸⁸ *Id.* at 656; cf. Richard A. Posner, *Overcoming Law* 118-19 (1995) (describing judges' aversion to reversal); Justin Fox & Matthew Stephenson, *Judicial Review & Democratic Failure*, at 6-10 (unpublished manuscript 2010), available at 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 it were, 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.

⁸⁹ Jaffe & Lerner, *supra* note 6; Rai, *supra* note 11, at 2057 & n. 24 (“the PTO is an entirely fee-funded organization”); Tony Dutra, *Obama Signs Bill Increasing PTO Funding in FY 2010, But Experts Say Not Enough*, 80 PCTJ 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”).

⁹⁰ 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); M. Todd Henderson & James C. Spindler, *Corporate Heroin: A Defense of Perks, Executive Loans, and Conspicuous Consumption*, 93 Geo. L.J. 1835 (2005) (defending this practice in the private sector).

⁹¹ 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 from PTO coffers.” *Id.*; see also *Figueroa v. United States*, 66 Fed. Cl. 139, 143 (2005); Press Release, Am. Bar Ass'n, PTO Fee Diversion Costs Jobs: Bar, Industry United Against Diversion 1 (Apr. 2003), available at <http://www.abanet.org/intelprop/feediversion.pdf> (“nearly \$750 million dollars have been withheld from the USPTO in the past decade”).

⁹² See *supra* notes 36-37 (describing the attitudinal model of judging, which is driven largely by judges' preferences regarding the substantive content of the law).

⁹³ Posner, *supra* note 75, at 118-19.

Other than substantive policy preferences, the objectives of Federal Circuit judges are fairly limited. They are paid in lockstep with other appellate judges⁹⁴ and have essentially no prospects for advancement.⁹⁵ 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.⁹⁶ These will limit the number of dissents that they write, and they will also limit the frequency with which the judges are willing to hear cases en banc (a time-consuming, often rancorous process). But otherwise they should not much impact the judges' substantive decision-making.

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 pre-existing cutpoint.⁹⁷ Precedent will thus limit the cases in which the judges will deviate from existing law. Particular judges, however, may have individual cutpoints to the left and right of this median point.⁹⁸ These individual cutpoints will influence the judges' behavior.⁹⁹ Thus, if two judges with cutpoints to the right of the Circuit's cutpoint¹⁰⁰ 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.¹⁰¹ If Federal Circuit judges are largely homogenous—if their individual cutpoints are similarly located—then any given three-judge panel will likely resemble the Circuit as a whole, and there should not be a great deal of deviation from the full Circuit's cutpoint. But if there is a great deal of variance among Federal Circuit judges, then the possibility exists that two judges on a panel will together form a majority with a viewpoint that diverges greatly from the Circuit's cutpoint.¹⁰²

Finally, the judges of the Federal Circuit will simply err some proportion of the time, voting to grant patents that should be denied and vice versa.

3. The Parties' Interaction

⁹⁴ Judicial Salaries Since 1968, available at <http://www.uscourts.gov/Viewer.aspx?doc=/uscourts/JudgesJudgeships/docs/JudicialSalarieschart.pdf> (listing salaries for federal judges and members of Congress).

⁹⁵ 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 private-sector job upon retirement from the Circuit.

⁹⁶ Posner, *supra* note 75, at 125-135 (describing a large class of theories of judging, all of which share this characteristic).

⁹⁷ See *supra* Part II.A.

⁹⁸ See Petherbridge, *supra* note 52 (explaining this effect with respect to the Federal Circuit).

⁹⁹ See *supra* notes 36-37 (explaining the role of individual ideology in an attitudinal model of judging).

¹⁰⁰ These would be judges with a more permissive attitude towards what is patentable.

¹⁰¹ 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. Posner, *supra* note 75, at 183. Nonetheless, a later section will abstract away from even this assumption.

¹⁰² Fischman, *supra* note 53, at 17, demonstrates this effect empirically for the Ninth Circuit.

How, then, will the parties in this institutional arrangement behave? Consider first the PTO.¹⁰³ 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 Federal Circuit's caselaw, the losing party would appeal and the PTO would risk having its decision overturned.¹⁰⁴ 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.¹⁰⁵ The same is true for systems of civil litigation; the further a lower-court judge deviates from appellate 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.¹⁰⁶

The essential component in such a system is formal symmetry in appellate review. Consider, for instance, an environmental regulation promulgated by the EPA. 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.¹⁰⁷ 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.¹⁰⁸ 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.

Yet this condition does not hold for the PTO. The administrative structure of patent law creates an asymmetry in appellate review, one that is present essentially nowhere else within the federal bureaucracy (or the federal courts). 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

¹⁰³ 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.

¹⁰⁴ 5 U.S.C. § 706 (APA provision setting forth the rules for judicial review of agency action).

¹⁰⁵ 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).

¹⁰⁶ 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 60, at 596 (describing the pull exerted by precedent).

¹⁰⁷ See 5 U.S.C. § 706; *Lujan v. Defenders of Wildlife*, 504 U.S. 555 (1992) (establishing the rules of standing that govern challenges to administrative actions).

¹⁰⁸ See *Alyeska Pipeline Serv. Co. v. Wilderness Soc'y*, 421 U.S. 240, 247 (1975) (describing the "American system" in which each party typically bears its own costs).

patent at suit was granted.¹⁰⁹ This figure includes cases that are resolved at both the district and appellate levels, and so it almost certainly understates the age of patents that reach the Federal Circuit.¹¹⁰ By the time a patent reaches the federal courts on a suit for infringement, the individuals who were involved with the patent's grant—including the PTO Commissioner—will likely have left the office.¹¹¹ 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 typical 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 important 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. There 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 be 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.¹¹²

Accordingly, one would expect the self-interested administrators of the patent office to minimize the number of appeals and reversals wherever possible. The PTO could avoid review and reversal simply by approving every patent—or at least every patent that the Federal Circuit might plausibly grant. Yet the patent office does face some constraints: if it were to grant literally every patent, or even every vaguely plausible patent, it would presumably face harsh criticism or even sanction from Congress, the President, and the patenting community.¹¹³

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

¹⁰⁹ John R. Allison & Mark A. Lemley, *Empirical Evidence on the Validity of Litigated Patents*, 26 AIPLA Q. J. 185, 234-240 (1998); see also John R. Allison et al., *Valuable Patents*, 92 GEO. L.J. 435, 477 (2004) (providing similar data).

¹¹⁰ Allison & Lemley, *supra* note 109, at 236.

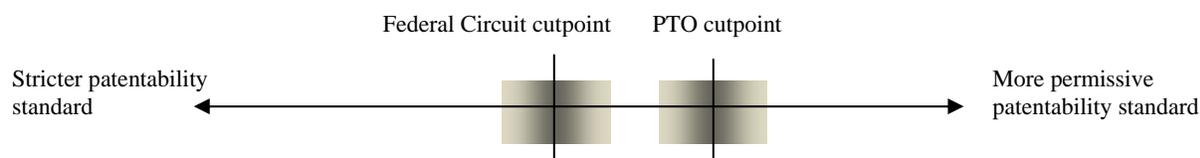
¹¹¹ There have been six PTO Commissioners since 1993, none of whom has held the job for more than five years. See Under Secretary of Commerce for Intellectual Property, *available at* http://en.wikipedia.org/wiki/Under_Secretary_of_Commerce_for_Intellectual_Property. Generally speaking, very few government 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 Lemley and Bhaven N. Sampat, *Examiner Characteristics and the Patent Grant Rate* (unpublished manuscript 2009), *available at* <http://ssrn.com/abstract=1329091> (“A first problem is data: we lack direct information about whether examiners are tenured or untenured.”).

¹¹² See *supra* Part II.A.3.

¹¹³ The PTO is obviously already bumping up against this constraint. See *supra* note 9 and sources cited therein.

patents can impose severe costs on other private parties (or the economy at large),¹¹⁴ the individuals who govern the PTO do not internalize these costs.¹¹⁵ 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 errantly *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 figure 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. But the PTO's cutpoint is private information. Inventors will 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 the a lenient PTO, inventors have strong incentives to file even dubious patent applications.¹¹⁶ 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 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. 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 may or may not exceed the PTO's cutpoint as well, 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 extremely few false negatives—patents that the Federal Circuit would normally approve, but that the PTO denies. Avoiding false negatives—and the

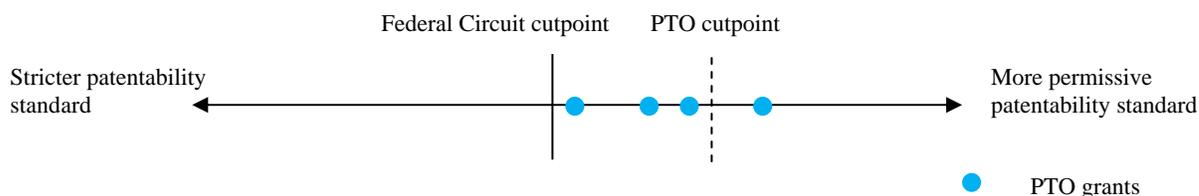
¹¹⁴ See Michael A. Heller & Rebecca S. Eisenberg, *Can Patents Deter Innovation? The Anticommons in Biomedical Research*, 280 *SCIENCE* 698 (1998) (analyzing the negative effects of a crowded patent field on innovation and market entrance); Christopher R. Leslie, *The Anticompetitive Effects of Unenforced Invalid Patents*, 91 *MINN. L. REV.* 101 (2006) (analyzing the harm that even unenforced patents can do to competitors and consumers within the marketplace).

¹¹⁵ 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 and against broader patent rights. See Long, *supra* note 83, 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.

¹¹⁶ Of course, they have even far stronger incentives to file for valid patents, as there is every expectation that such patents will be granted.

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.

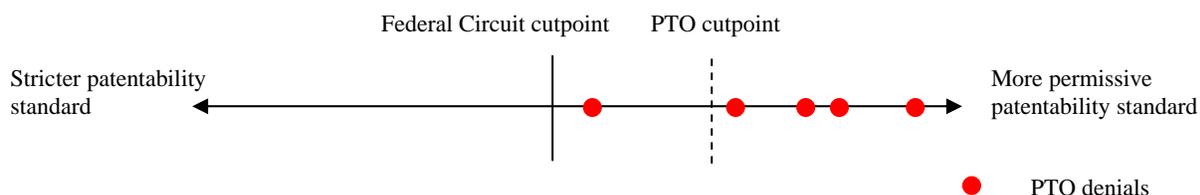
Figure 9: Improperly Granted Patents



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.¹²⁰

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.¹²¹ Figure 10 displays the patent applications that have been denied by the PTO.

Figure 10: Denied Patents



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.¹²²

¹²⁰ See *supra* notes 9 & 16-21 (describing the proliferation of invalid patents and their costs).

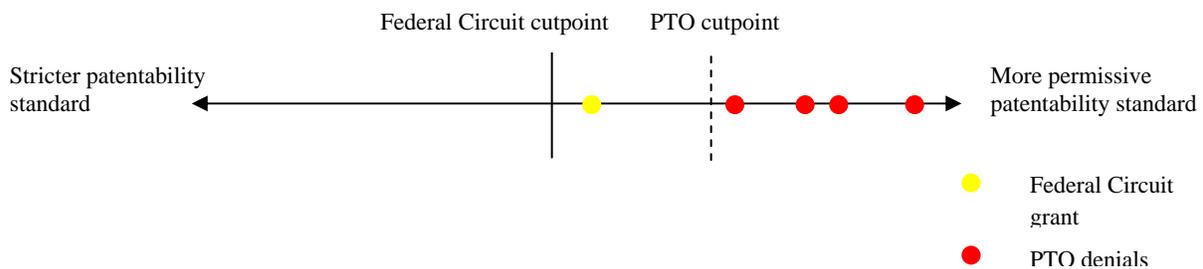
¹²¹ Again, to be specific there are two mechanisms by which the question of patent validity could present itself to the Federal Circuit. True and false negatives may be appealed directly to the court; true and false positives might find their way before the court if they are involved in suits for infringement. This second mode is discussed further below.

¹²² 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

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 denials will involve inventions that the Federal Circuit does not believe are patentable. Recall that these affirmances will 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.¹²³

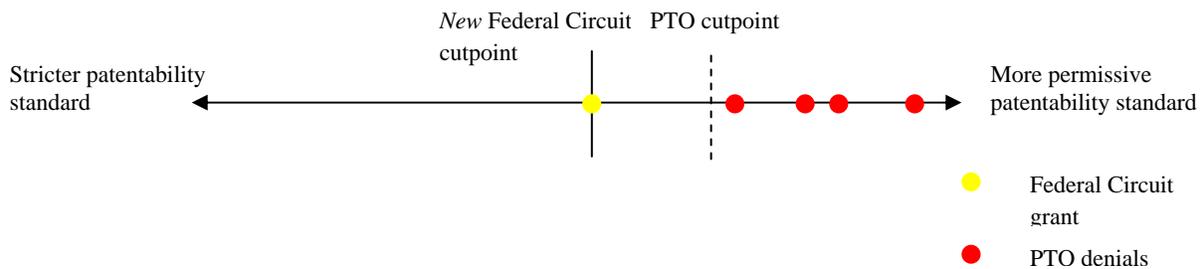
However, every once in a while, as a matter of random chance or because of a favorable panel draw, the Federal Circuit will grant one of these patents.¹²⁴ In Figure 11, this decision by the Federal Circuit is represented by a yellow dot.

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. Figure 12 displays this effect:

Figure 12: Patent Inflation



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.

¹²³ See *supra* note 59 and accompanying text.

¹²⁴ See *id.*

The result is patent inflation: outward growth in the boundaries of what inventions may be patented. Even if every new patent doesn't stretch the boundaries of patentability to their fullest extent (as indicated by Figure 12), each precedent 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 of error and avoid reversals, the cycle will 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.¹²⁵

5. Patent Inflation and Suits for Infringement

At the same time, the PTO will also generate true and false positives—the many patents 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 contract patent scope, and that this will balance the effect of the true negatives appealed directly to the court.

Yet this is not the case. 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 will be more likely to settle obvious cases with certain outcomes, leaving only close cases for the circuit to decide. 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.¹²⁶ The cases that will reach trial—much less appeal—are those in which the outcome is uncertain.¹²⁷ All things being equal, the more well-established a question of patentability is, the less likely it is to be presented to the courts for review. If a patent is obviously valid or invalid—far to the left or right of the Federal Circuit's cutpoint—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.¹²⁸

¹²⁵ See *supra* note 10 and accompanying text.

¹²⁶ See William M. Landes, An Economic Analysis of the Courts, 14 J.L. & Econ. 61 (1971); Richard A. Posner, An Economic Approach to Legal Procedure and Judicial Administration, 2 J. Legal Stud. 399 (1973). The reason 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. *Id.*; see also John Bronsteen, Christopher Buccafusco, & Jonathan S. Masur, *Hedonic Adaptation and the Settlement of Civil Lawsuits*, 108 Colum. L. Rev. 1516, 1520-1522 (2008) (explaining this point).

¹²⁷ See John P. Gould, The Economics of Legal Conflicts, 2 J. Legal Stud. 279 (1973) (seeking to show why a larger percentage of lawsuits are settled out of court and providing hypothesis about what causes cases to go to trial).

¹²⁸ Cf. *id.* at 285 (describing the types of cases that will reach trial and appeal).

Moreover, the number of cases to the left and right of the cutpoint should be relatively equivalent. The reasons are twofold. First, the level of uncertainty in cases to the right and left of the cutpoint should be relatively equal.¹²⁹ And second, the number of patents that are just to the left and right of the cutpoint should be approximately equal: the PTO will endeavor to grant every application that is near the Federal Circuit's cutpoint, even if slightly to the right of it.¹³⁰ As a result, 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.

The result will be a net inflationary pressure on the frontiers of patent law. Cases that arrive at the Circuit through infringement (true and false positives) will present symmetric opportunities for expansion and contraction; cases that are directly appealed (true negatives) will provide asymmetric opportunities for expansion. On the whole, the Federal Circuit will be presented with more and better opportunities to enlarge the boundaries of patentability than to narrow them. There will be an overall gravity in the direction of more permissive patent rules.¹³¹ This is exactly the trend that scholars have observed over the past several decades.¹³² Notably, however, it does not necessarily depend on any ideological preference on the part of the Federal Circuit¹³³ or on any notion of agency capture.¹³⁴ This inflationary effect is generated through a combination of only three individually unremarkable factors: asymmetric appeals from the PTO, self-interest on the part of the agency, and occasional noise or error on by the Federal Circuit. Nothing else is required to produce a gradual outward creep in the scope of the law.

E. A Strategic Federal Circuit

One important feature of the preceding discussion is that two—and only two—of the three actors involved behave strategically. Inventors make strategic decisions regarding which applications to file, and the PTO makes strategic decisions regarding which patents to grant in order to avoid review and reversal. The Federal Circuit, by contrast, makes “honest” decisions—each judge votes based on precedent and her own preferences.

¹²⁹ See George L. Priest & Benjamin Klein, *The Selection of Disputes for Litigation*, 13 *J. Legal Stud.* 1, 4–5 (1984) (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—involving patents that push the frontiers of the law—should be more uncertain.

¹³⁰ See *supra* Part I.A.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 will 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 (2007) (demonstrating that judges will decide cases on easier grounds that involve less contravention of precedent and possibility of reversal whenever such grounds are available to them).

¹³¹ 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—in the net, the law will expand the boundaries outward. Along the way, however, it will presumably move in fits and starts.

¹³² See *supra* note 10 and sources cited therein.

¹³³ See *supra* note 15 and sources cited therein.

¹³⁴ See *supra* note 14 and sources cited therein.

It is of course possible to imagine relaxing this assumption as well; judges could themselves behave strategically. Here, Federal Circuit judges would understand that natural mechanisms of selection and appeal will 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 law in the course of rejecting an invention that is unpatentable under existing law, contrary to typical judicial practice¹³⁵ 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 put 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.¹³⁶

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 and the rights of patent-holders over the past two decades.¹³⁷ 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.¹³⁸ 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.

F. Congress, the Supreme Court, and Patent Remedies

The effects described above are endemic to the relationship between PTO and the Federal Circuit. Congress and the Supreme Court are not subject to similar pressures and selection effects. Accordingly, those two bodies might well act as checks on the PTO and Federal Circuit, were they to play active roles in shaping the law.

For its part, Congress has been largely an absentee landlord; the last major patent legislation was passed in 1952.¹³⁹ For many years after the creation of the Federal Circuit, the

¹³⁵ See Schauer, *supra* note 60, at 589.

¹³⁶ Cf. Douglas Lichtman, *A Conversation With Chief Judge Paul Michel*, The IP Colloquium, available at http://www.ssrn.com/abstract_id=1618994.

¹³⁷ See *supra* note 10.

¹³⁸ See *supra* notes 14-15 and sources cited therein.

¹³⁹ Long, *supra* note 14, at 1968.

Supreme Court was similarly reticent and granted certiorari in very few patent cases.¹⁴⁰ 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 seven patent cases since 2005.¹⁴¹ 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.¹⁴²

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.

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 evaluating the agency based on the quality of the patents it issues without regard to which patents are eventually litigated.¹⁴³ Yet these reforms might be politically difficult to implement, in part because they differ so dramatically from the panoply of proposals that have already been suggested and debated.¹⁴⁴

Perhaps the most promising solution is a familiar one: a system of inter partes review that allowed outside parties to challenge a patent before it issued.¹⁴⁵ However, a purely administrative challenge system located entirely within the PTO—the reform typically suggested—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 would be 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

¹⁴⁰ See Mark D. Janis, *Patent Law in the Age of the Invisible Supreme Court*, 2001 U. Ill. L. Rev. 387, 387-89 (2001) (noting the Supreme Court's withdraw from patent law since the creation of the Federal Circuit).

¹⁴¹ See *Merck KGaA v. Integra Lifesciences I, Ltd.*, 545 U.S. 193(2005); *eBay Inc. v. MercExchange, L.L.C.*, 547 U.S. 388 (2006); *MedImmune, Inc. v. Genentech, Inc.*, 549 U.S. 118 (2007); *Microsoft Corp. v. AT&T Corp.* 550 U.S. 437 (2007); *KSR Intern. Co. v. Teleflex Inc.*, 550 U.S. 398 (2007); *Quanta Computer, Inc. v. LG Electronics, Inc.*, 553 U.S. 617 (2008); *Bilski v. Kappos*, 130 S. Ct. 3218 (2010); see also John M. Golden, *The Supreme Court As "Prime Percolator"*, 56 UCLA L. Rev. 657, 658 (2009) (“[T]he Supreme Court has, in the past six years, asserted its dominion over patent law with frequency and force.”).

¹⁴² See, e.g., Peter Lee, *Patent Law and the Two Cultures*, Yale L.J. (forthcoming 2010), available at http://www.ssrn.com/abstract_id=1500050.

¹⁴³ For instance, Congress could convene an advisory panel of patent experts to evaluate the quality of a random sample of issued patents.

¹⁴⁴ Another more radical solution would be to grant the PTO substantive rulemaking authority. See Jonathan S. Masur, *The Rise and Fall of Judicially Managed Patents* (unpublished manuscript 2010).

¹⁴⁵ See, e.g., Farrell & Merges, *supra* note 27, at 948 (proposing a system of inter partes review); Jaffe & Lerner, *supra* note 6, at 176 (same); Lichtman & Lemley, *supra* note 9, at 63-64 (favoring such a system).

decisions. The possibility that aggrieved parties could appeal 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.¹⁴⁶ Accordingly, the Circuit would have approximately as many opportunities to expand the law as to contract it, muting the inflationary effect.

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.

III. The Patenting of Software and Business Methods

As a means of demonstrating this interaction in practice, this section presents a case study of the development of the patentable subject matter rules concerning software and business method patents, culminating in the Federal Circuit and Supreme Court decisions in *Bilski*.¹⁴⁷ Whether an invention recites patentable subject matter is of course only one of the many hurdles to patentability, but it is perhaps the subject most at the forefront of debates over the scope of patent law (due in large part to the *Bilski* decisions).¹⁴⁸

The last two decades have seen a rapid expansion in the patenting of intangible processes such as software and business methods. *Bilski* may have represented a slight retrenchment by the Federal Circuit—which was then quickly followed by a PTO-led reinvigoration of permissive patentability rules. In combination, the PTO and the Federal Circuit seem determined to push the boundaries of patentability, perhaps even despite their own best intentions.

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.¹⁴⁹ 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.¹⁵⁰ This expansion began with patents on software methods, which the Federal Circuit and the PTO began to allow so long as they were linked in some

¹⁴⁶ 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.

¹⁴⁷ *Bilski v. Kappos*, 130 S. Ct. 3218, 3226-28 (2010); *In re Bilski*, 545 F.3d 943 (Fed. Cir. 2008) (en banc).

¹⁴⁸ See, e.g., Robert Patrick Merges & John Fitzgerald Duffy, *Patent Law & Policy: 2009-10 Supplement*, at 3.

¹⁴⁹ *Diamond v. Diehr*, 450 U.S. 175 (1981).

¹⁵⁰ Justin M. Lee, *The Board Bites Back: Bilski and the B.P.A.I.*, 24 Berkeley Tech. L.J. 49, 49 (2009) (describing the "period of considerable expansion in subject-matter eligibility").

fashion to a standard computer.¹⁵¹ Within a few years software patents had become relatively well-accepted.¹⁵² The PTO and Federal Circuit then turned their attention to patents on business methods.¹⁵³

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 inchoate and unconnected from the production of any tangible good.¹⁵⁴ The PTO describes business methods in similar terms.¹⁵⁵ Included in this definition are methods for reducing the amount of taxes an individual must pay, methods for creating and selling financial products, methods for structuring transactions between a business and a customer,¹⁵⁶ and methods for reducing risk or creating other advantageous business conditions.¹⁵⁷

The Federal Circuit first squarely addressed whether business methods constituted patentable subject matter¹⁵⁸ in 1998, in *State Street Bank v. Signature Financial Group*.¹⁵⁹ There, the court held 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.¹⁶⁰ 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.¹⁶¹ The Federal Circuit thus held the invention patentable, but without reaching the question of whether the patent must necessarily involve a machine, or what requirements that machine must meet.¹⁶² By any measure, the Signature patent qualified.

B. *Bilski* in the Courts

State Street Bank “opened the floodgates on business method patents.”¹⁶³ Over the next decade, inventors patented a wide variety of business methods with little impediment (or

¹⁵¹ 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).

¹⁵² Lee, *supra* note 150, at 49-50.

¹⁵³ *Id.*

¹⁵⁴ See, e.g., Gerard N. Magliocca, *Patenting the Curve Ball: Business Methods and Industry Norms*, 2009 B.Y.U. L. Rev. 875, 914.

¹⁵⁵ United States Patent and Trademark Office, Class 705, Data Processing: Financial Business Practice, Management, or Cost/Price Determination, available at <http://www.uspto.gov/web/patents/classification/uspc705/defs705.htm>.

¹⁵⁶ U.S. Patent 5,960,411; see also Patently-O, *Amazon One-Click Patent Slides Through Reexamination*, Mar. 10, 2010, available at <http://www.patentlyo.com/patent/2010/03/amazon-one-click-patent-slides-through-reexamination.html>.

¹⁵⁷ U.S. Patent App. No. 08/833,892.

¹⁵⁸ 35 U.S.C. § 101 (enumerating the categories of inventions that may be patented).

¹⁵⁹ 149 F.3d 1368 (1998).

¹⁶⁰ *Id.* at 1370.

¹⁶¹ *Id.* at 1371-72 (citing U.S. Patent No. 5,193,056).

¹⁶² *Id.*

¹⁶³ Douglas L. Price, *Assessing the Patentability of Financial Services and Products*, 3 *Journal of High Technology Law* 141, 153 (2004).

guidance) from the Federal Circuit. A decade later, the Federal Circuit again took up the issue in *In re Bilski*.¹⁶⁴

Bernard Bilski had filed for an application on “[a] method for managing the consumption risk costs of a commodity sold by a commodity provider at a fixed price.”¹⁶⁵ 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 (namely the coal company).¹⁶⁶ 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.¹⁶⁷

Importantly, this patent application—one which Bernard Bilski had elected to appeal to the Federal Circuit—was an outlandish one by the standards of business method patents. Unlike the patent in *State Street*,¹⁶⁸ Bilski did not attach any sort of machine to his claims.¹⁶⁹ They were merely free-standing money-making ideas, unmoored from any connection to the physical world.¹⁷⁰ It is thus not surprising that Bilski’s application, which pushed beyond the boundaries set by *State Street*, was the one to make it to the court.

Bilski’s invention is undoubtedly unpatentable on any number of grounds,¹⁷¹ not least of all the fact that it has been a well-understood economic concept for centuries.¹⁷² But before the court reached that issue¹⁷³ it held that the invention was merely an abstract idea and thus constituted unpatentable subject matter.¹⁷⁴ The Federal Circuit 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 into a different state or thing.”¹⁷⁵ Because Bilski’s invention involved neither a machine nor the transformation of any matter, it failed the Federal Circuit’s test.¹⁷⁶

The Federal Circuit’s resolution of *Bilski* immediately called into questions vast swaths of existing patents. In addition to patents on business methods, Bilski threatened tax¹⁷⁷ and

¹⁶⁴ 545 F.3d 943 (Fed. Cir. 2008) (en banc). It is worth noting that while *State Street* reached the Federal Circuit in the course of litigation, *Bilski* arrived on appeal from the PTO’s denial of Bilski’s patent.

¹⁶⁵ U.S. Patent App. No. 08/833,892.

¹⁶⁶ *Id.*; see also *Bilski*, 545 F.3d at 944.

¹⁶⁷ *Id.* (“In essence, the claim is for a method of hedging risk in the field of commodities trading.”).

¹⁶⁸ *State Street*, 149 F.3d at 1370.

¹⁶⁹ U.S. Patent App. No. 08/833,892 (*Bilski* patent).

¹⁷⁰ *Id.*

¹⁷¹ 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*, available at <http://www.patentlyo.com/patent/2008/02/bilski-full-caf.html> (“this case looks problematic because of serious obviousness problems”).

¹⁷² 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).

¹⁷³ See *In re Comiskey*, 499 F.3d 1365 (Fed. Cir. 2007) (holding that the PTO must consider patentable subject matter questions under § 101 before turning to other issues).

¹⁷⁴ *Bilski*, 545 F.3d at 947-48.

¹⁷⁵ *Id.* at 956.

¹⁷⁶ *Id.*

¹⁷⁷ Lee, *supra* note 150, at 70 (2009) (noting that Bilski might threaten tax patents).

software¹⁷⁸ patents, which similarly do not involve any obvious transformation of matter and need not always be linked to machines. Yet the Federal Circuit's opinion left open perhaps the most crucial question: 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.¹⁷⁹ 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.¹⁸⁰ These computers are rarely specialized to the task at hand; by and large, a standard personal computer will suffice.¹⁸¹ 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 jeopardize entire fields of patents.

C. *Bilski* Before the PTO

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.¹⁸² 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."¹⁸³ Through the middle of 2009, approximately six months after the Federal Circuit had handed down *Bilski*, the PTO held to the view that general purpose computers did not qualify as "machines" under governing Federal Circuit law.¹⁸⁴

However, in July of 2009, the PTO shifted its stance. In *Ex Parte Dickerson*, it granted a patent on a "computerized method" of optimizing business performance.¹⁸⁵ 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."¹⁸⁶ The machine in *Dickerson* was not at all

¹⁷⁸ Matthew Moore, In re *Bilski* and the "Machine-Or-Transformation" Test: Receding Boundaries for Patent-Eligible Subject Matter, 2010 Duke L. & Tech. Rev. 5, 23 (2010) ("it appears that many software patents may be in jeopardy either because they are not tied to a particular machine or because they have no relationship with any physical entity").

¹⁷⁹ See *Bilski*, 545 F.3d at 946; U.S. Patent App. No. 08/833,892.

¹⁸⁰ See, e.g., Jason Pill, 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 rely on quick and accurate calculations that only modern computers can perform."); Matthew Moore, In re *Bilski* and the "Machine-Or-Transformation" Test: Receding Boundaries for Patent-Eligible Subject Matter, 2010 Duke L. & Tech. Rev. 5, 30 (2010) ("After all, many business methods are inextricably intertwined with computers and software.").

¹⁸¹ It is worth noting that the *State Street* patent might 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 Street*, 149 F.3d at 1370-72 (describing the patent claims).

¹⁸² *Ex parte Langemyr*, Slip Op., at 19 (BPAI May 28, 2008).

¹⁸³ *Id.* at 22; see also *Ex parte Wasynczuk*, Slip op. at 25 (BPAI May 28, 2008); Merges & Duffy, *supra* note 148, at 43.

¹⁸⁴ See *id.*; see also, e.g., *See, e.g., Ex parte Cornea-Hasegan* (B.P.A.I. Jan. 13, 2009) (refusing to grant a patent on similar grounds).

¹⁸⁵ 2009 WL 2007184 (B.P.A.I. Jul 9, 2009).

¹⁸⁶ *Id.* at 3; see also Merges & Duffy, *supra* note 148, at 44.

particular: the claims called only for a general-purpose computer.¹⁸⁷ The PTO's reversal did not go unnoticed; even the chief judge of the circuit observed that the circuit had taken "inconsistent approaches" to the issue of general purpose computers since *Bilski*.¹⁸⁸

The PTO's behavior was entirely predictable and consistent with the model developed above. 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 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, opting for a rule under which even general-purpose computers sufficed for purposes of patentability.¹⁸⁹

The result 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, and one that should not greatly inhibit inventors from obtaining and enforcing valuable patents.

Had the Federal Circuit's *Bilski* decision stood, 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, such as a general apparatus for adding and subtracting, 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 certiorari¹⁹⁰ and announced that the Federal Circuit could not treat the machine-or-transformation test as determinative of patentability.¹⁹¹ While that test might be "a useful and important clue,"¹⁹² at bottom the Federal Circuit must ascertain whether the invention is an "abstract idea" in order to determine whether it is patentable.¹⁹³ The law has thus been returned to a state of substantial uncertainty, and it will remain for the Federal Circuit to sort out its particularities in the years to come. And as the PTO reacts to these new rules, it will likely send the Circuit an ever-advancing wave of boundary-pushing patent denials, primed for conversion into new, inflationary law.

¹⁸⁷ Ex parte Dickerson, 2009 WL 2007184, at 4.

¹⁸⁸ Tony Dutra, *Chief Judge Michel Says Commentary Reading Too Much Into Bilski Opinion*, 78 Pat. Trademark & Copyright J. (BNA) 373 (July 24, 2009); see also Merges & Duffy, *supra* note 148, at 44.

¹⁸⁹ See Ex parte Dickerson, at 6.

¹⁹⁰ *Bilski v. Doll*, 129 S. Ct. 2735 (2009).

¹⁹¹ *Bilski v. Kappos*, 130 S. Ct. 3218, 3226-28 (2010).

¹⁹² *Id.* at 3227.

¹⁹³ *Id.* at 3225; see also Chakrabarty, 447 U.S. at 309 (enumerating types of unpatentable 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 them. 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 may be partly (or even entirely) a consequence of the relationship between the PTO and Federal Circuit. If this is indeed the case, policymakers should seek institutional remedies to what is fundamentally an institutional problem.

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