

University of Pennsylvania
Law Review

FOUNDED 1852

Formerly
American Law Register

VOL. 150

JANUARY 2002

No. 3

ARTICLES

UNRAVELING THE PATENT-ANTITRUST PARADOX

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INTRODUCTION

The intersection of the patent and antitrust laws presents a formidable paradox. The patent laws increase invention and innovation by offering inventors a right to exclude. The antitrust laws foster compe-

tion, sometimes through the condemnation of such exclusion. As patents become ever more important in our information-based economy, the significance of the conflict between the patent and antitrust laws will only increase.

Courts and commentators have struggled with this paradox for generations. They have experimented with an array of disparate tests to determine, for example, when a company's reliance on its patents should immunize it from the antitrust offense of monopolization. Courts have applied rebuttable presumptions, emphasized the "scope" of the patent, examined the defendant's intent, and questioned whether an "essential facility" was denied. These various tests not only have dashed any hopes of predictability but also have failed to wrestle with the fundamental tension between the patent and antitrust laws.¹

Moreover, the tests are both overinclusive and underinclusive in targeting activity that harms welfare.² Some of the tests are overinclu-

¹ The courts also have ignored the most thoughtful literature in the field, refusing even to acknowledge the tests offered in the seminal approaches to the intersection: WARD S. BOWMAN, JR., *PATENT AND ANTITRUST LAW: A LEGAL AND ECONOMIC APPRAISAL*, at xii (1973); William F. Baxter, *Legal Restrictions on Exploitation of the Patent Monopoly: An Economic Analysis*, 76 *YALE L.J.* 267, 313 (1966); Louis Kaplow, *The Patent-Antitrust Intersection: A Reappraisal*, 97 *HARV. L. REV.* 1813, 1820 (1984). For a discussion of this literature, see *infra* Parts I.C.4-6.

² This Article will refer to "welfare" to signify "total welfare," or the sum of consumer surplus and producer surplus. Stated most simply, producer surplus consists of an aggregation of the differences between the price at which producers would be willing to sell the product and the market price. See generally HAL R. VARIAN, *INTERMEDIATE MICROECONOMICS: A MODERN APPROACH* 256-57 (5th ed. 1999); Peter J. Hammer, *Antitrust Beyond Competition: Market Failures, Total Welfare, and the Challenge of Intramarket Second-Best Tradeoffs*, 98 *MICH. L. REV.* 849, 858 (2000). Consumer surplus (sometimes referred to as consumer welfare) refers to an aggregation of the differences between what consumers would be willing to spend for goods and the market price. See generally VARIAN, *supra*, at 247. The terms are often used imprecisely, in particular as antitrust commentators refer to "consumer welfare" when, because they also are considering producer surplus, they mean "total welfare." See Robert H. Bork, *Legislative Intent and the Policy of the Sherman Act*, 9 *J.L. & ECON.* 7, 7-10 (1966). This Article will refer most generally to the positive effects on welfare (or total welfare) of the antitrust and patent laws, and will not trace the precise contributions to welfare attributable to consumer or producer surplus.

Although the antitrust laws conceivably could promote other goals, such as "the political and social values of dispersed control over economic resources, multiple choices for producers and consumers free of the arbitrary dictates of monopolies or cartels, equal opportunity, and 'fairness' in economic dealings," PHILLIP AREEDA & LOUIS KAPLOW, *ANTITRUST ANALYSIS: PROBLEMS, TEXT, AND CASES* 49 (5th ed. 1997), this Article will focus on the objective of increasing total economic welfare. It concentrates on this objective because of the difficulties in simultaneously promoting economic and noneconomic goals, the contribution to noneconomic objectives from the pursuit of economic ends, and the inconsistencies among the various noneconomic

sive in condemning conduct that has no adverse effect on welfare. For example, a company's intent to exclude typically reveals nothing more than an unexceptional desire to defeat its competitors. By penalizing the right to exclude, courts engaging in this type of inquiry take direct aim at the *modus operandi* of the patent laws.

At the same time, some of the tests are underinclusive in their blind deference to the patent laws. To state that action within the scope of the patent should automatically be immune from antitrust scrutiny (so the incentives underlying the patent system are not diminished) "solves" the patent-antitrust conflict only by according priority to the patent laws. This purported solution amounts to an assumption that the increase in welfare from safeguarding the patentee's right to exclude will *always* outweigh the increase that would have resulted from antitrust's enhanced competition. Such an approach ensures that only the patent, rather than the antitrust, path to innovation will be traversed. In short, courts' approaches to the patent-antitrust intersection fail to recognize the two independent paths to innovation and fail to articulate a framework that conceivably could be used to maximize (or at least to increase) welfare.

This Article proposes a new reconciliation of the patent and antitrust laws. It proffers a common denominator by which the laws can be measured and compared: innovation. It also recognizes that innovation is achieved through different routes in different industries and thus adjusts the antitrust analysis based on the industry. For example, it counsels courts³ to defer to patents in industries in which patents are critical to innovation, such as pharmaceuticals. And it anticipates a more significant role for the antitrust laws in industries in which the market provides the incentives to innovate, such as computer software.

Part I of this Article sketches the dimensions of the conflict between the patent system and the antitrust laws, both in theory and

objectives. See 1 PHILLIP E. AREEDA ET AL., *ANTITRUST LAW: AN ANALYSIS OF ANTITRUST PRINCIPLES AND THEIR APPLICATION* ¶ 100, at 5, ¶ 110, at 96, ¶ 111, at 97-115 (2d ed. 2000) (stating that populist goals should not be considered in formulating antitrust rules since antitrust courts cannot promote these goals when they conflict with economic efficiency, and "even where there is no evident conflict . . . [they] would multiply legal uncertainties and threaten inefficiencies not easily recognized or proved"); see also, e.g., Joseph F. Brodley, *The Economic Goals of Antitrust: Efficiency, Consumer Welfare, and Technological Progress*, 62 N.Y.U. L. REV. 1020, 1021 (1987) ("[T]he purely economic goals of antitrust, properly defined, embrace most of what a progressive antitrust policy requires.").

³ As explained in greater detail *infra* Part II.B.2.a, because of the indeterminate nature of the Sherman Act, courts have been the primary expositors of antitrust law.

through a hypothetical example. Part I then surveys representative approaches to the intersection that courts have taken and rejects proposed solutions to the conflict that courts and commentators have offered.

Part II begins the process of reconciling the patent and antitrust laws by introducing the common denominator of innovation. Part II grounds this selection in the text and legislative history of the statutes and the relevant jurisprudence and economic theory.

Part III sets forth the test that courts should apply when evaluating monopolists' patent-based activity under Section 2 of the Sherman Act. Introduced at its most general level, the test takes the form of a rebuttable presumption that proceeds in three steps: (1) a presumption that, as long as the monopolist has a justification for the patent-based action other than harming competitors, the conduct is lawful; (2) a rebuttal if competition (and not patents) is responsible for innovation in the industry; and (3) a surrebuttal by which the monopolist can demonstrate that the relevant market in the industry is characterized by innovation. Courts are to determine whether the rebuttal applies based on an evaluation of three *ex ante* factors—the presence of market-based incentives to innovate, the ease of creating the patented product, and the difficulty of imitating the product—and the *ex post* factor of the cumulative nature of innovation in the industry. If both the *ex ante* and *ex post* factors reveal the primacy of competition in attaining innovation in an industry, then the rebuttal will be met. Part III concludes by applying the test to three hypothetical patentee monopolists: the Bully Monopolist, the Biopharmaceutical Patentee, and the Internet Auctioneer.

Part IV responds to anticipated objections to the proposal. First, it contends that courts are able to apply the test. Second, it demonstrates that any reduction in the incentives underlying the patent system resulting from the application of the test would be minor and not cause for concern. Third, it explains why the proposal is superior to readjustments to the patent system alone.

I. THE PROBLEM: A CONFLICT AND NO EASY RECONCILIATION

A. *The Patent-Antitrust Conflict*⁴

1. Different Paths to Welfare

On their broadest level, the patent and antitrust laws both endeavor to increase welfare.⁵ But the paths by which they pursue this objective frequently diverge.

The primary purpose of the patent system is straightforward.⁶ Inventors and investors expend substantial resources in creating and developing inventions. Conducting research and development and bringing an invention to market often are lengthy and expensive pro-

⁴ The elucidation of a conflict between the patent and antitrust laws requires certain caveats. In many cases, the laws will not conflict. For example, a company's pure exclusion of competitors will not implicate the antitrust laws if that company lacks monopoly power. Any "conflict" also must be situated in the context in which it will typically arise: a continually developing antitrust common law that, in certain of its iterations, affects patents. Of course, the conflict also should be recognized as a consequence of the categorization—in fact, the creation—of laws of "antitrust" and "intellectual property." A different categorization might have avoided the conflict (while creating other difficulties). The present categorization nonetheless implicates the larger issue, one lying beyond the scope of this Article, of the manner in which antitrust law might affect parties' property rights.

⁵ See Sherman Antitrust Act, 15 U.S.C. §§ 1-7 (1994) (prohibiting trusts in restraint of trade and monopolies); Patent Act of 1790, ch. 7, § 1, 1 Stat. 109 (codified as amended at 35 U.S.C. §§ 100-376 (1994)) (granting patents to inventors and discoverers of new and useful processes, machines, manufactures, or compositions of matter); see also BOWMAN, *supra* note 1, at 1 ("Both antitrust law and patent law have a common central economic goal: to maximize wealth by producing what consumers want at the lowest cost." (emphasis omitted)).

⁶ The justification advanced in the text is the standard "utilitarian" justification that courts and commentators have articulated and that the Constitution contemplates. See U.S. CONST. art. I, § 8, cl. 8 (granting Congress the power "[t]o promote the Progress of Science and useful Arts, by securing for limited Times to Authors and Inventors the exclusive Right to their respective Writings and Discoveries"); see also, e.g., F.M. SCHERER & DAVID ROSS, *INDUSTRIAL MARKET STRUCTURE AND ECONOMIC PERFORMANCE* 621-24 (3d ed. 1990) (discussing the logic of granting protection from competition with patents). Other conceivable (but much less frequently voiced) justifications for the intellectual property system (though not the patent system) include the "moral rights" approach, see Martin A. Roeder, *The Doctrine of Moral Right: A Study in the Law of Artists, Authors, and Creators*, 53 HARV. L. REV. 554, 557 (1940) (describing a creative act as an extension of an individual's identity); the related "natural rights" approach, see JOHN LOCKE, *TWO TREATISES OF GOVERNMENT* (Peter Laskett ed., Cambridge Univ. Press 1988) (1690) (stating that individuals are entitled to the fruits of their labor, as long as others are not worse off as a result of the privatization); and the "personhood perspective," see Margaret Jane Radin, *Property and Personhood*, 34 STAN. L. REV. 957, 957 (1982) (stating that an individual needs control over resources in the external environment that take the form of property rights).

cesses, with no guarantees of success at the end of the tunnel. And on those occasions when success is achieved, “free riders” who did not make any such investments might imitate the hard-earned innovation and appropriate its value for themselves. Such activity would tend to deter future inventors and investors, thereby reducing innovation.⁷ To prevent this, the patent laws promise inventors a right to exclude for a period of twenty years,⁸ a right that permits inventors to charge prices higher than their postinvention costs, thereby allowing them to recover profits in excess of the value of their front-end investments.⁹ The right to exclude thus is designed to increase appropriability and thereby the level of invention in society.

The unique characteristics of intellectual property support the right to exclude and shed light on the tension between the patent and antitrust laws. First, intellectual property is a public good. That is, it is nonrival (consumption by one person does not leave any less of the good to be consumed by others) and nonexclusive (others cannot be excluded from consuming it).¹⁰ As a result of these characteristics, public goods tend to be underproduced and subject to free riders, who are tempted to imitate the invention after it has been developed.¹¹ Second, the value of intellectual property often is uncertain,

⁷ See Kenneth W. Dam, *The Economic Underpinnings of Patent Law*, 23 J. LEGAL STUD. 247, 247 (1994) (describing the “appropriability problem” that occurs where a firm fails to recover invention costs due to the inadequate protection of information). For a discussion of the concepts of invention and innovation, see *infra* note 180.

⁸ For a discussion of the duration of the right to exclude, see *infra* note 370 and accompanying text.

⁹ See SCHERER & ROSS, *supra* note 6, at 622 (“[A]n . . . inventor . . . must expect that once commercialization occurs, product prices can be held above postinvention production and marketing costs long enough so that the discounted present value of the profits . . . will exceed the value of the front-end investment.”). Firms patent not only to prevent copying and to recover their development costs, but also, for example, to establish bargaining positions in cross-licensing agreements and to block rival patents on related innovations. See *infra* note 275 for a discussion of other reasons a firm may seek patents.

¹⁰ See Yochai Benkler, *A Political Economy of the Public Domain: Markets in Information Goods Versus the Marketplace of Ideas*, in EXPANDING THE BOUNDARIES OF INTELLECTUAL PROPERTY: INNOVATION POLICY FOR THE KNOWLEDGE SOCIETY 267, 270-71 n.9 (Rochelle Cooper Dreyfuss et al. eds., 2001) [hereinafter EXPANDING BOUNDARIES] (“A pure public good is one that is nonexcludable and nonrivalrous.”); see also DONALD S. CHISUM ET AL., PRINCIPLES OF PATENT LAW 58-59 (1998) (discussing the two characteristics of public goods); Tracy R. Lewis & Dennis A. Yao, *Some Reflections on the Antitrust Treatment of Intellectual Property*, 63 ANTITRUST L.J. 603, 606 (1995) (“Unlike private property, it is difficult to control the use and dissemination of intellectual property once it is released.”).

¹¹ CHISUM ET AL., *supra* note 10, at 59; see also Nancy T. Gallini & Michael J. Trebilcock, *Intellectual Property Rights and Competition Policy: A Framework for the Analysis of Eco-*

most notably because of its novelty and information asymmetry.¹² From an antitrust perspective, therefore, it is difficult for enforcers and courts to determine the effect of particular practices involving intellectual property on welfare.

The antitrust laws, on the other hand, scrutinize activity that restricts competition. The rationale of the laws is that competition leads to lower prices, higher output, and more innovation, and that certain agreements between competitors or conduct by monopolists prevents consumers from enjoying these benefits.¹³ Because, for example, monopolists lack the constraints provided by competitive markets, they often reduce output, raise prices, limit innovation (so as not to introduce products that might dislodge their market position), and fail to allocate resources to the uses most highly valued by consumers.¹⁴ But many acts undertaken by patentee monopolists or agreements between patentees and licensees restrict competition *by their very operation*. For example, patentees may refuse to use or license their patent¹⁵ or may impose quantity restrictions, royalty payments, grantbacks,¹⁶ territorial restrictions,¹⁷ or field of use restrictions¹⁸ on

nomic and Legal Issues, in COMPETITION POLICY AND INTELLECTUAL PROPERTY RIGHTS IN THE KNOWLEDGE-BASED ECONOMY 17, 17 (Robert D. Anderson & Nancy T. Gallini eds., 1998) ("Intellectual property embodies information that is a public good: an investor's consumption of the information does not preclude others from consuming it and so, in the absence of property rights, an innovation will be imitated.")

¹² See Lewis & Yao, *supra* note 10, at 605 (stating that the novelty of intellectual property "implies that the uses and future development potential" of the property are not well-known and that information asymmetry results from the inventor knowing more about the characteristics of the property than do potential licensees or antitrust agencies).

¹³ See BOWMAN, *supra* note 1, at 1 ("[M]onopoly makes it possible to restrict output and raise prices so that consumers pay more for and get less of the things they want most."); Baxter, *supra* note 1, at 305 ("The effect of monopoly is to lessen output, raise prices, increase returns to producers and diminish social utility . . .").

¹⁴ BOWMAN, *supra* note 1, at 1; VARIAN, *supra* note 2, at 420-24; Baxter, *supra* note 1, at 305. *But see* JOSEPH A. SCHUMPETER, CAPITALISM, SOCIALISM, AND DEMOCRACY 87-106 (3d ed. 1950) (arguing that in cases in which monopolists have "superior methods" available to them than those afforded to a "crowd of competitors," the theory that the monopoly price is higher and the monopoly output is lower does not hold).

¹⁵ 35 U.S.C. § 271(d)(4) (1994).

¹⁶ Grantbacks are arrangements by which a licensee agrees to extend to the licensor of intellectual property the right to use the licensee's improvements to the licensed technology. U.S. DEP'T OF JUSTICE & FED. TRADE COMM'N, ANTITRUST GUIDELINES FOR THE LICENSING OF INTELLECTUAL PROPERTY ¶ 5.6 (1995) [hereinafter INTELLECTUAL PROPERTY GUIDELINES].

¹⁷ The patent statute permits the exclusive licensing of a patent to "the whole or any specified part of the United States." 35 U.S.C. § 261 (1994).

¹⁸ Such a restriction limits the licensee's use of the patented invention to one or

licensees. Activity that may be encouraged under the patent system frequently raises the suspicion of the antitrust laws by reducing competition.

The provision of the antitrust laws that targets monopolies, Section 2 of the Sherman Act, exposes this tension most dramatically in focusing on the actions of a single firm. A court may view a company's refusal to share its patented product as predatory conduct justifying a Section 2 violation, even if the action is perfectly lawful under the patent laws. And as courts employ tests that fail to acknowledge the beneficial purposes of patents, such as those focusing on the intent of the monopolist, a change in the market, or the denial of an essential facility, patents may get short shrift.¹⁹

more specified fields. *See, e.g.*, *Gen. Talking Pictures Corp. v. W. Elec. Co.*, 304 U.S. 175, 179-82 (1938) (holding that a licensee's leasing of amplifiers for use in theaters violated the patent's restriction against commercial use).

¹⁹ For several reasons, Section 2 of the Sherman Act will be the primary vantage point of this Article in exploring the patent-antitrust intersection. Section 2 punishes "[e]very person who shall monopolize, or attempt to monopolize, or combine or conspire with any other person or persons, to monopolize any part of the trade or commerce among the several States." 15 U.S.C. § 2 (Supp. 1997).

First, the type of conduct at issue in a Section 2 case presents the conflict most directly. Only under Section 2 may a firm's unilateral invocation of its right to exclude—the modus operandi of the patent laws—lead to condemnation. In contrast, Section 1 of the Sherman Act applies to agreements, in which the objectionable conduct relates to actions other than pure exclusion. Courts also must be careful not to condemn unilateral actions such as excluding competitors or raising prices that, while initially appearing suspicious, may be consistent with vigorous patent-based activity. *See* Frank H. Easterbrook, *The Limits of Antitrust*, 63 TEX. L. REV. 1, 4 (1984) ("The tradition [of inhospitality] is that judges view each business practice with suspicion If the defendant cannot convince the judge that its practices are an essential feature of competition, the judge forbids their use.").

Second, analysis under Section 2 proves insightful because of the provision's amorphous jurisprudence. Courts interpreting Section 2 all begin with the same test: an antitrust plaintiff must show "(1) the possession of monopoly power in the relevant market and (2) the willful acquisition or maintenance of that power as distinguished from growth or development as a consequence of a superior product, business acumen, or historic accident." *United States v. Grinnell Corp.*, 384 U.S. 563, 570-71 (1966). But the similarities among courts' Section 2 analyses end with the recitation of the test. As discussed *infra* Part I.B., courts have applied an array of tests, in some of which they defer to the patent, but in many of which they shoehorn the patent-based nature of the act into a generic Section 2 analysis. In contrast, Section 1, as currently interpreted, offers more specific and manageable tests for courts to apply. For example, tying has its four-part (sometimes five-part) test; exclusive dealing focuses on the degree of foreclosure in the relevant market; and price fixing is *per se* unlawful. *See, e.g.*, *Eastman Kodak Co. v. Image Technical Servs., Inc.* ("*Kodak I*"), 504 U.S. 451, 461-62 (1992) (describing the elements of a tying claim as including (1) two separate products, (2) coercion, (3) market power in the tying product market, and (4) a not insubstantial amount of commerce in the tied product market); *Fortner Enter., Inc. v.*

Another lens through which to view the tension between the patent and antitrust laws involves the balance between static and dynamic efficiency. In interpreting antitrust law, courts have focused primarily on static efficiency—in other words, on increasing economic welfare through a reallocation of the existing supply of resources in a Pareto-optimal fashion (i.e., so that no individual's welfare could be improved by a resource reallocation without some other person's welfare being diminished).²⁰ In particular, courts analyze allocative efficiency, striving for an optimal allocation of goods and services to customers.²¹ Patent law, on the other hand, attempts to increase dynamic efficiency, or the Pareto-optimal allocation of resources between the pre-

U.S. Steel Corp., 394 U.S. 495, 498-99 (1969) (indicating the elements of a tying claim); Tampa Elec. Co. v. Nashville Coal Co., 365 U.S. 320, 334 (1961) (“The remaining determination [after finding an exclusive-dealing arrangement] . . . is whether the pre-emption of competition . . . tends to substantially foreclose competition in the relevant . . . market.”); United States v. Socony-Vacuum Oil Co., 310 U.S. 150, 218 (1940) (“[F]or over forty years this Court has consistently and without deviation adhered to the principle that price-fixing agreements are unlawful *per se* under the Sherman Act . . .”). As a result, courts interpreting Section 1 do not have the flexibility to fashion a series of tests differentially affecting patents as they do under Section 2.

Third, courts are forced to confront the patent-based nature of the defendant's activity more frequently in Section 2 cases than under other antitrust provisions. Because Section 2 focuses on the unilateral activity of the defendant, courts sometimes (even if less often than they should) analyze the nature of the activity—exploring, for example, the justifications for a patentee monopolist's refusal to deal with competitors. Under Section 1, in contrast, the court first applies unexceptional, nonpatent-based standards, such as the extent to which the market is foreclosed by an agreement. The patent-based nature of the activity comes into play, if at all, only when courts consider the procompetitive justifications for the agreement. This late consideration becomes dispositive when it never even is reached: most courts dispose of Section 1 cases by finding that the plaintiff has failed to prove an anticompetitive effect and by never reaching the issue of procompetitive effects. See Michael A. Carrier, *The Real Rule of Reason: Bridging the Disconnect*, 1999 B.Y.U. L. REV. 1265, 1268 (finding that courts have disposed of eighty-four percent of Rule of Reason cases in the modern era on the grounds that the plaintiff could not demonstrate an anticompetitive effect).

In short, Section 2 offers the best perch from which to explore the patent-antitrust conflict. The unilateral activity at issue frequently calls for a direct focus on the patent-based nature of the conduct. The courts have created tests that either ignore or defer excessively to the incentives underlying the patent system. The exclusion promised under the patent laws is punished under the antitrust laws. And as the courts are tossed between the powerful conflicting waves of patent and antitrust, the dim light-house signal provided by Section 2 fades to black.

²⁰ W. KIP VISCUSI ET AL., *ECONOMICS OF REGULATION AND ANTITRUST* 75-76 (3d ed. 2000); Merritt B. Fox, *Securities Disclosure in a Globalizing Market: Who Should Regulate Whom*, 95 MICH. L. REV. 2498, 2551 n.99 (1997).

²¹ Antitrust courts could reduce the tension between the laws by focusing on dynamic efficiency (for example, by endeavoring to increase innovation).

sent and the future.²² The incentives underlying the patent system apply in the long term through the encouragement of future invention and innovation. Although courts that have analyzed the patent-antitrust intersection have not focused explicitly on the tradeoffs between static and dynamic efficiency, the disparate temporal perspectives provided by the distinct notions of efficiency further underscore the patent-antitrust conflict.

2. An Example

A hypothetical example illustrates the conflict. Imagine a biopharmaceutical²³ company that develops a drug, call it “Drug Z,” that treats a particular disease. This company, call it “CureFinder,” spent twelve years and \$400 million in bringing the drug to market. It located the gene responsible for the disease and the protein coded by the gene, and it developed, tested, received approval from the U.S. Food and Drug Administration (FDA) for, and marketed a drug that appears to cure the disease. CureFinder applied for and received a patent on Drug Z. And because it is the only drug on the market that can treat the disease—in other words, there is a lack of substitutability from the standpoint of patients with the disease—it has monopoly power in the market defined by drugs treating the disease.²⁴

²² William J. Baumol & Janusz A. Ordover, *Antitrust: Source of Dynamic and Static Inefficiencies?*, in ANTITRUST, INNOVATION, AND COMPETITIVENESS 82, 83-84 (Thomas M. Jorde & David J. Teece eds., 1992).

²³ The biotechnology and pharmaceutical industries are often collectively referred to as the biopharmaceutical industry. In recent years, particularly due to the rise of genetic research, there has been a convergence between biotechnology and pharmaceutical firms. See Walter W. Powell, *Networks of Learning in Biotechnology: Opportunities and Constraints Associated with Relational Contracting in a Knowledge-Intensive Field*, in EXPANDING BOUNDARIES, *supra* note 10, at 251, 253 (“Various participants in th[e] field [of molecular biology and genetics research] . . . have turned to all manner of joint ventures, research partnerships, strategic alliances, minority equity investments, and licensing arrangements to speed the process of drug development and to compensate for their lack of internal capabilities.”); Arti K. Rai, *Fostering Cumulative Innovation in the Biopharmaceutical Industry: The Role of Patents and Antitrust*, 16 BERKELEY TECH. L.J. 813, 816-17 (2001) (noting that pharmaceutical research is based on genetic or proteomic information often owned by biotechnology companies and that firms in both industries have entered into alliances more frequently in recent years).

²⁴ Cf. David A. Balto & James F. Mongoven, *Antitrust Enforcement in Pharmaceutical Industry Mergers*, 54 FOOD & DRUG L.J. 255, 258 (1999) (stating that “[t]he relevant product may be defined as narrowly as a specific drug compound or the manner in which that compound interacts with the body [or even the] once-a-day use of the drug, where buyers perceive a separate market for different dosage forms,” thus limiting the product market in pharmaceutical mergers to drugs in individual therapeutic categories); Thomas B. Marcotullio, *The Battle Against Drug-Makers: An Analysis of European*

Now assume that a competitor of CureFinder, who will be called “CureCopier,” wishes to obtain access to Drug Z to develop additional commercial uses for it, such as similar drugs that might cure related diseases.²⁵ Of course, since Drug Z is patented, CureCopier cannot simply begin to manufacture or use it.²⁶ Nor can it independently discover or reverse engineer Drug Z. It must receive permission, typically through a license, from CureFinder before it can use Drug Z. But CureFinder, having incurred substantial expenditures in developing the drug, might not wish to share the rewards of its hard-earned labor. Years and hundreds of millions of dollars went into the discovery and commercialization of Drug Z, and the patent laws reward such activity by promising the inventor the right to exploit the invention by excluding competitors or charging prices higher than its postinvention costs. In other words, CureFinder can refuse to license the discovery. Or it can license it on terms that it chooses—say, for a particular price, or in a certain territory, or for a specific use.

CureFinder refuses to license Drug Z to CureCopier. CureCopier then sues CureFinder in federal district court, claiming a violation of Section 2 of the Sherman Act.²⁷ It alleges that CureFinder has committed the offense of monopolization by refusing to license Drug Z. How should the court rule? Should it conclude that CureFinder did nothing more than exclude a competitor from its patented product, as the patent laws anticipate, and that the activity thus does not constitute the exclusionary conduct a monopolist must undertake to violate

Union and United States Merger Enforcement in the Pharmaceutical Industry 1995-1999, 32 LAW & POL'Y INT'L BUS. 449, 462 (2001) (noting the absence of cross-elasticity of demand between drugs).

²⁵ Cf. Rebecca S. Eisenberg, *Patents and the Progress of Science: Exclusive Rights and Experimental Use*, 56 U. CHI. L. REV. 1017, 1075 (1989) (recommending a new application of the experimental use exemption in patent law to subsequent researchers that compete with the patentee and that seek to achieve further advances in the field of the invention); Diane Furman, *Pharmaceutical and Biotechnology Licensing and the Patent/Regulatory Background*, in TECHNOLOGY LICENSING AND LITIGATION 1998: PROTECTING YOUR CLIENT'S RIGHTS 7, 24 (P.L.I. Patents, Copyrights, Trademarks, & Literary Prop. Course, Handbook Series No. 514, 1998) (stating that pharmaceutical companies may license for reasons including “income; unblocking cross-licenses; litigation avoidance or resolution; [or] because [the] product [is] not a ‘fit’ with [the] out-licensing company’s marketing focus”). The reader who is skeptical that a pharmaceutical company would license to a competitor may wish to substitute a more “upstream” relationship, where innovation expenditures are still significant, but licensing is more widespread.

²⁶ See *supra* notes 6-9 and accompanying text (recounting the purpose of the patent system).

²⁷ Alternatively, CureFinder sues CureCopier for patent infringement, and CureCopier files an antitrust counterclaim.

the antitrust laws? Or should it conclude that CureFinder engaged in a predatory act by refusing to license a drug essential to compete in the market, thereby committing the offense of monopolization? What factors should the court consider in wrestling with the intersection of the patent and antitrust laws? The markets involved? The industries? The defendant's intent? Characteristics of the patent?

* * *

This Article will develop an approach that courts can utilize in determining whether CureFinder and other patentee monopolists violate Section 2 of the Sherman Act by engaging in activities based on their patents, such as refusals to license. Its primary building block is the industry, and its goal is to increase innovation. In other words, the approach examines how innovation is achieved in specific industries and tailors the analysis of patent-related conduct accordingly, deferring more to patentees in industries in which patents are critical to innovation than to patentees in industries marked by competition-centered innovation. But first, it is worth exploring how courts today would examine the hypothetical offered above. The next section thus surveys representative cases in which courts have applied varying methods of analysis to monopolists' patent-based activities under Section 2.²⁸

²⁸ The test is designed to apply to all patentee activity challenged under Section 2, with the examples in this Article focusing on refusals to license. Application of similar innovation-focused, industry-specific analysis in other contexts, such as mergers or agreements between competitors, deserves further attention but is beyond the scope of this Article.

B. Representative Section 2 Cases²⁹

Four cases reveal the diversity of approaches that courts have applied to monopolists' patent-based activity³⁰ under Section 2: *In re Independent Service Organizations Antitrust Litigation* ("Xerox");³¹ *Image Technical Services, Inc. v. Eastman Kodak Co.* ("Kodak I");³² *Intergraph Corp. v. Intel Corp.*;³³ and *United States v. Microsoft Corp.*³⁴ This Section will present the courts' analyses and then apply such reasoning to the hypothetical example offered in the previous section of CureFinder's

²⁹ While Section 2 of the Sherman Act is the primary focus of this Article, some of the cases discussed in this Section address Section 1, and others arise in the copyright-antitrust intersection. Although the applicable principles are largely the same, one distinction lies in the less powerful protection offered by copyright. Unlike patents, copyrights protect only expression, not ideas, and they do not bar independent discovery. See 17 U.S.C. § 102(b) (1997) ("In no case does copyright protection for an original work of authorship extend to any idea, procedure, process, system, method of operation, concept, principle, or discovery"); *Baker v. Selden*, 101 U.S. 99, 104 (1879) ("The copyright of a book on book-keeping cannot secure the exclusive right to make, sell, and use account-books prepared upon the plan set forth in such book."); *Whelan Assocs. v. Jaslow Dental Lab., Inc.*, 797 F.2d 1222, 1234 (3d Cir. 1986) ("It is axiomatic that copyright does not protect ideas, but only expressions of ideas."). There are also stronger defenses to copyright infringement, such as the "fair use" defense, which protects use of a copyrighted work "for purposes such as criticism, comment, news reporting, teaching, . . . scholarship, or research." 17 U.S.C. § 107 (1997). Other limiting principles are the "merger" doctrine, which bars copyright protection when an idea can be expressed in only one or a limited number of ways, see *Morrissey v. Procter & Gamble Co.*, 379 F.2d 675, 678 (1st Cir. 1967) (denying copyright protection where "the topic necessarily requires" . . . if not only one form of expression, at best only a limited number" (quoting *Sampson & Murdock Co. v. Seaver-Radford Co.*, 140 F. 539, 541 (1st Cir. 1905)); Maureen A. O'Rourke, *Toward a Doctrine of Fair Use in Patent Law*, 100 COLUM. L. REV. 1177, 1192 n.59 (2000); and the *scènes-à-faire* principle, which refuses to extend copyright protection to the "incidents, characters or settings which are as a practical matter indispensable, or at least standard, in the treatment of a given topic," *Atari, Inc. v. N. Am. Philips Consumer Elecs. Corp.*, 672 F.2d 607, 616 (7th Cir. 1982) (citation omitted). As a result of these differences, courts could conceivably defer to the less potent copyright (and thus not find an antitrust violation) in circumstances in which they would not defer to the stronger patent (and thus find an antitrust offense).

³⁰ In interpreting the antitrust laws, courts necessarily have addressed other potentially overlapping statutes, such as the patent laws. See *infra* note 364 (explaining the relationship between antitrust and other laws).

³¹ 203 F.3d 1322 (Fed. Cir. 2000).

³² 125 F.3d 1195 (9th Cir. 1997).

³³ 3 F. Supp. 2d 1255 (N.D. Ala. 1998), *vacated*, 195 F.3d 1346, 1357-58 (Fed. Cir. 1999).

³⁴ 84 F. Supp. 2d 9, 61 (D.D.C. 1999) (findings of fact), 87 F. Supp. 2d 30 (D.D.C.) (conclusions of law), *aff'd in part and rev'd in part*, 253 F.3d 34 (D.C. Cir. 2000) (en banc), *cert. denied*, 122 S. Ct. 350 (2001).

refusal to license.³⁵

1. *Xerox*

The Federal Circuit's decision in *Xerox* provides an example of an approach favoring patentees. The long-running *Xerox* litigation involved a patentee's refusal to license patented diagnostic parts to or-

³⁵ Before presenting the cases, a quick review of history is in order. In the era immediately after enactment of the Sherman Act in 1890, courts routinely dismissed antitrust challenges against patentholders, contending that patents were a form of private property that could be utilized however the holder wished. *See, e.g.*, *Bement v. Nat'l Harrow Co.*, 186 U.S. 70, 91 (1902) (upholding a patent pool that set prices and required members to use technology licensed to the pool, touting "the general rule [of] absolute freedom in the use or sale of rights under the patent laws"); *Heaton-Peninsular Button-Fastener Co. v. Eureka Specialty Co.*, 77 F. 288, 291 (6th Cir. 1896) ("[The] exclusive right of use [granted by a patent] is a true and absolute monopoly . . . and this right to monopolize the use of the invention or discovery is the substantial property right conferred by law, and which the public is under obligation to respect and protect."); *Nat'l Folding-Box & Paper Co. v. Robertson*, 99 F. 985, 989 (C.C.D. Conn. 1900) (holding that the infringer of a patent could not defend his behavior by claiming that the patent was assigned for the illegal purpose of creating a monopoly and controlling prices).

From the second decade of the twentieth century until the mid-1970s, courts retreated from this immunity, presuming that patents automatically conferred monopoly power, *see, e.g.*, *Zenith Radio Corp. v. Hazeltine Research, Inc.*, 395 U.S. 100, 135 (1969) ("The heart of [the patentee's] legal monopoly is the right to invoke the State's power to prevent others from utilizing [the patentee's] discovery without . . . consent."); *Int'l Salt Co. v. United States*, 332 U.S. 392, 395 (1947) ("The appellant's patents confer a limited monopoly of the invention they reward."); *Crown Die & Tool Co. v. Nye Tool & Mach. Works*, 261 U.S. 24, 37 (1923) (referring to "[t]he monopoly thus granted" by the assignment of a patent), and limiting the "monopoly" granted by the patent laws to activities within the scope of the patent, *see, e.g.*, *United States v. Line Material Co.*, 333 U.S. 287, 308 (1948) (striking down a cross-licensing agreement with price-fixing provisions because "the possession of a valid patent . . . does not give the patentee any exemption from the provisions of the Sherman Act beyond the limits of the patent monopoly"); *Int'l Salt*, 332 U.S. at 395-96 (invalidating tying arrangement that included unpatented products). *See generally* Willard K. Tom & Joshua A. Newberg, *Antitrust and Intellectual Property: From Separate Spheres to Unified Field*, 66 ANTITRUST L.J. 167, 170-73 (1997) (discussing the "monopoly granted to the patentee"). Beginning in the late 1970s, the framework of antitrust analysis shifted dramatically. Influenced by cases such as *Continental T.V., Inc. v. GTE Sylvania, Inc.*, 433 U.S. 36, 57-59 (1977), applying the Rule of Reason—rather than per se analysis—to vertical nonprice restraints; legislation such as the National Cooperative Research Act of 1984, Pub. L. 98-462, 98 Stat. 1815 (codified at 15 U.S.C. §§ 4301-4305 (1993)); and the Patent Misuse Reform Act of 1988, Pub. L. No. 100-703, 102 Stat. 4676 (codified at 35 U.S.C. § 271(d) (1994)); and scholars from the "Chicago School," who posited economic efficiency as the sole concern of the antitrust laws, antitrust courts relied more heavily (and exclusively) on economic analysis and on the competitive effects of restraints.

ganizations that provided service or parts for the patentee's product.³⁶ As a result of the Supreme Court's holding in *Eastman Kodak Co. v. Image Technical Services, Inc.* ("Kodak I"), that one brand of a product could constitute an antitrust market and that a manufacturer in a competitive "primary" market thus could have monopoly power in the "secondary" market of the servicing or parts of its own equipment,³⁷ many manufacturers of durable products requiring service or parts—such as Xerox—could be treated as monopolists.³⁸

Xerox manufactured, sold, and serviced high-volume photocopiers.³⁹ It instituted a policy of not selling parts for one (and later, all) of its lines of copiers to independent service organizations (ISOs) unless they were also end-users of the copiers.⁴⁰ At one point, Xerox cut off certain ISOs' abilities to directly purchase such restricted parts.⁴¹ Xerox also established an "on-site end-user verification" program to confirm that parts actually were used by end-users.⁴² A class of ISOs filed an antitrust lawsuit, and Xerox settled the suit by agreeing to suspend its parts policy and by licensing its diagnostic software for a period of time.⁴³ One ISO opted out of the settlement and filed suit, alleging that Xerox violated the antitrust laws by setting the prices on its patented parts higher for ISOs than for end-users in an attempt to force ISOs to raise their prices.⁴⁴ Such conduct ostensibly was designed to eliminate ISOs as competitors in service markets for Xerox copiers.

The Federal Circuit held that Xerox did not violate Section 2. The court first held that it would decide questions of preemption and of the relationship between patent and antitrust law as matters of Federal Circuit law.⁴⁵ It then emphasized the centrality of the right to exclude in the patent system before carving out three limited categories in which a patentholder would not be immune from antitrust liability: (1) tying patented and unpatented products; (2) obtaining a patent

³⁶ 203 F.3d at 1322.

³⁷ 504 U.S. 451, 481-82 (1992).

³⁸ For a discussion of the *Kodak* case, see *infra* notes 55-76 and accompanying text.

³⁹ *Xerox*, 203 F.3d at 1324.

⁴⁰ *Id.*

⁴¹ *Id.*

⁴² *Id.*

⁴³ *Id.*

⁴⁴ *Id.*; see also 989 F. Supp. 1131, 1133 (D. Kan. 1997) (setting forth the factual history concerning Xerox's efforts to "use price as a weapon to defeat ISO competition in the service market").

⁴⁵ 203 F.3d at 1325.

through knowing and willful fraud; and (3) engaging in sham litigation.⁴⁶ The Federal Circuit also refused to examine the patentee's subjective intent in refusing to deal with a competitor.⁴⁷ And it confirmed that action "within the scope" of the patent grant could not violate the antitrust laws.⁴⁸ Because the court concluded that Xerox's refusal to sell its patented parts did not exceed the scope of the patent grant and did not fall within any of the three exceptions, it concluded that Xerox did not violate the antitrust laws.⁴⁹

The *Xerox* approach would apply to the example of CureFinder posed above in a straightforward manner.⁵⁰ Because CureFinder's refusal to license is within the scope of the patent (in fact, the activity is as squarely within the scope as can be imagined), because, relatedly, the company did not engage in any of the three prohibited activities of tying, fraud in obtaining a patent, or filing sham litigation,⁵¹ and because the court would refuse to examine CureFinder's subjective motivation for its action, a court following *Xerox* would find that CureFinder did not violate Section 2.

The *Xerox* approach has benefits: it typically will promote the incentives underlying the patent laws (at least for the initial invention)⁵²

⁴⁶ *Id.* at 1326. "Fraud" is to be determined by reference to the case of *Walker Process Equipment, Inc. v. Food Machinery & Chemical Corp.*, 382 U.S. 172 (1965). *Xerox*, 203 F.3d at 1326. To prove the "sham" exception, a plaintiff must demonstrate that the suit is objectively baseless and "motivated by a desire to impose collateral, anti-competitive injury rather than to obtain a justifiable legal remedy." *Id.* (citation omitted).

The court borrowed its exceptions to immunity from the law on patent infringement lawsuits without examining the relationship between refusals to license and infringement suits. For example, it ignored the First Amendment underpinnings of the "sham" exception to immunity elaborated in *Eastern R.R. Presidents Conference v. Noerr Motor Freight, Inc.*, 365 U.S. 127 (1961), and the different context presented by refusals to license, in which the exceptions for infringement lawsuits are largely irrelevant.

⁴⁷ *Xerox*, 203 F.3d at 1327.

⁴⁸ *Id.*; see also *id.* at 1327-28 (refusing to punish any anticompetitive effect resulting from the refusal to deal as long as it was not "illegally extended beyond the statutory patent grant").

⁴⁹ *Id.* at 1326-28. The court also adopted an approach immunizing copyright-based action as long as the copyrights were obtained lawfully and were not used to gain monopoly power beyond the copyright grant. *Id.* at 1329.

⁵⁰ Care must be taken in applying a test developed by a court in a particular factual setting to a different scenario. This concern is partially mollified here by the overlap between CureFinder's refusal to license and the refusals to license analyzed by the court in *Xerox* (and by courts in the other cases discussed in this Section).

⁵¹ Brief consideration of the offenses of tying, fraud in obtaining a patent, and sham litigation reveals how extreme the conduct must be to not receive immunity under this analysis.

⁵² See *infra* Part III.B.2 (noting that, in certain settings, "even if the incentives sup-

and will offer clarity for monopolists, inventors, and future courts and lawyers. But the approach resolves the patent-antitrust conflict only by deferring excessively to the patent: any action within the scope of the patent is automatically lawful. In fact, even some acts outside the scope of the patent would be protected under *Xerox*, since the three prohibited activities constitute only a subset of acts outside the scope of the patent.⁵³ In short, the *Xerox* approach prevents antitrust from playing any legitimate role in the attempt to increase welfare.⁵⁴

2. *Kodak II*

The Ninth Circuit, in *Kodak II*, addressed another lawsuit brought by ISOs against the manufacturer of a durable product.⁵⁵ Kodak manufactured high volume photocopiers. The market for such copi-

porting the initial patent diminish, those for post-patent innovation likely would increase").

⁵³ The *Xerox* approach also fails to consider the industry involved or the effects of the conduct on welfare.

⁵⁴ For an additional example of a court protecting a patentee monopolist that acts within the scope of the patent, see *United States v. Westinghouse Electric Corp.*, 648 F.2d 642, 647 (9th Cir. 1981), holding that action outside the patent grant is not protected and providing examples including tying arrangements, price fixing, "refusing to grant licenses except upon condition that royalties be paid on unpatented products," and "attempt[ing] to monopolize an industry by acquiring all present and future patents relevant to that industry." Some courts have afforded intellectual property monopolists absolute immunity from Section 2. See *Miller Insituform, Inc. v. Insituform of N. Am., Inc.*, 830 F.2d 606, 609 (6th Cir. 1987) ("[A] patentholder who lawfully acquires a patent cannot be held liable under Section 2 of the Sherman Act for maintaining the monopoly power he lawfully acquired by refusing to license the patent to others."); *SCM Corp. v. Xerox Corp.*, 645 F.2d 1195, 1206 (2d Cir. 1981) ("[W]here a patent has been lawfully acquired, subsequent conduct permissible under the patent laws cannot trigger any liability under the antitrust laws."); *In re Indep. Serv. Orgs. Antitrust Litig.*, 989 F. Supp. 1131, 1135 (D. Kan. 1997) (holding that there can be no unlawful leveraging of monopoly power when a patentholder exercises his patent rights); *Tricom, Inc. v. Elec. Data Sys. Corp.*, 902 F. Supp. 741, 743 (E.D. Mich. 1995) ("Under patent and copyright law, [the patentholder] may not be compelled to license its proprietary software to anyone."); *Bell Atl. Bus. Sys. Servs., Inc. v. Hitachi Data Sys. Corp.*, No. C93-20079 JW, 1995 WL 798935, at *7 (N.D. Cal. Mar. 10, 1995) ("[I]t is not a violation of antitrust law . . . to refuse to sell, license or commercially transfer copyrighted information to anyone . . . even if customers are put in the position of only getting the benefit of the copyrighted items if they hire [the copyright owners]."); *Advanced Computer Servs., Inc. v. MAI Sys. Corp.*, 845 F. Supp. 356, 370 n.17 (E.D. Va. 1994) (deciding that protecting a copyright is a valid business justification for limiting a license).

For criticism of the "extremely narrow limits" the *Xerox* court placed on "a virtually unfettered right of a patentholder to refuse to deal in order to achieve an anticompetitive objective," see Robert F. Pitofsky, *Challenges of the New Economy: Issues at the Intersection of Antitrust and Intellectual Property*, 68 ANTITRUST L.J. 913, 921 (2001).

⁵⁵ 125 F.3d at 1195.

ers was competitive, and it included Xerox, IBM, and Canon.⁵⁶ Kodak also sold and installed replacement parts for its equipment; in this activity, Kodak competed with ISOs.⁵⁷ Kodak repaired at least eighty percent of the machines it manufactured.⁵⁸ Although the company had, at one time, sold parts for repair service to ISOs, it began to restrict this practice as competition with the ISOs increased.⁵⁹ As a result of the limited access, ISOs lacked a reliable supply of parts, and so were not able to compete with Kodak in providing multi-year service contracts.⁶⁰ Several ISOs claimed that the parts shortage forced them out of business.⁶¹

The ISOs sued Kodak, claiming that its restrictive parts policy violated Sections 1 and 2 of the Sherman Act.⁶² Although the district court granted summary judgment for Kodak,⁶³ the Ninth Circuit reversed,⁶⁴ and the Supreme Court affirmed the appellate court's reversal.⁶⁵ In a landmark ruling on the issue of market power, the Supreme Court held that one brand of a product could constitute a separate market and that "the relevant market from the Kodak equipment owner's perspective is composed of only those companies that service Kodak machines."⁶⁶ The Court explained that even a competitive primary market would not forestall a finding of market power in aftermarkets where customers faced "significant information and switching costs."⁶⁷

⁵⁶ *Id.* at 1200.

⁵⁷ *Id.*

⁵⁸ *Id.* at 1200-01.

⁵⁹ *Id.* at 1201.

⁶⁰ *Id.*

⁶¹ *Id.*

⁶² No. C-87-1686-WWS, 1988 U.S. Dist. LEXIS 17218 (N.D. Cal. Apr. 18, 1988).

⁶³ *Id.*

⁶⁴ 903 F.2d 612 (9th Cir. 1990).

⁶⁵ 504 U.S. 451 (1992).

⁶⁶ *Id.* at 482.

⁶⁷ *Id.* at 473. This ruling has made every manufacturer of a durable product requiring servicing or parts a potential monopolist. Of relevance here, many of these durable products include patented parts. Admittedly, post-*Kodak* courts have "bent over backwards to construe *Kodak* as narrowly as possible." Herbert Hovenkamp, *Post-Chicago Antitrust: A Review and Critique*, 2001 COLUM. BUS. L. REV. 257, 286; see, e.g., *SMS Sys. Maint. Servs., Inc. v. Digital Equip. Corp.*, 188 F.3d 11, 20 (1st Cir. 1999); *Brokerage Concepts, Inc. v. U.S. Healthcare, Inc.*, 140 F.3d 494, 515 (3d Cir. 1998); *PSI Repair Servs., Inc. v. Honeywell, Inc.*, 104 F.3d 811, 818-20 (6th Cir. 1997). Nonetheless, the *Kodak* view of market power ensures that patentholders, many of whose products implicate secondary parts or servicing "markets," will be subject to antitrust scrutiny and that courts will not be able to avoid the patent-antitrust intersection.

Upon remand from the Supreme Court, a jury entered a verdict against Kodak.⁶⁸ The Ninth Circuit affirmed the verdict.⁶⁹ To ensure that the jury would account for the “procompetitive effects and statutory rights extended by the intellectual property laws,” the court adopted the presumption that the First Circuit had set forth in *Data General v. Grumman Systems Support Corp.* that a party’s “desire to exclude others from [use of] its [protected] work is a presumptively valid business justification.”⁷⁰ But the Ninth Circuit held that the presumption could be rebutted by evidence of pretext.⁷¹ The court explained: “Neither the aims of intellectual property law, nor the anti-trust laws justify allowing a monopolist to rely upon a pretextual business justification to mask anticompetitive conduct.”⁷² In applying its rebuttable presumption, the court found that “the proffered business justification played no part in the [defendant’s] decision to act.”⁷³ The court explained that “Kodak photocopy and micrographics equipment requires thousands of parts, of which only [sixty-five] were patented” and that Kodak’s parts manager testified that patents “did not cross [his] mind” when the company instituted its parts policy.⁷⁴ As a result, the court concluded that “it is more probable than not that the jury would have found Kodak’s presumptively valid business justification rebutted on the grounds of pretext.”⁷⁵ Even though the district court’s instructions to the jury “fail[ed] to give any weight” to Kodak’s intellectual property rights, the court concluded that such error was harmless.⁷⁶

How would a court apply the *Kodak II* approach to CureFinder?

⁶⁸ No. C-87-1686-AWT, 1996 U.S. Dist. LEXIS 2386, at *2 (N.D. Cal. Feb 28, 1996).

⁶⁹ 125 F.3d 1195 (9th Cir. 1997), *cert. denied*, 523 U.S. 1094 (1998).

⁷⁰ *Id.* at 1218 (citing *Data General*, 36 F.3d 1147, 1187 (1st Cir. 1994)). The *Data General* court found for a software monopolist that refused to share its diagnostic software with ISOs. 36 F.3d at 1189. It elucidated the benefits of such a presumption, explaining that “antitrust defendants [cannot be required] to prove and reprove the merits of [the] legislative assumption” that the right to exclude “promotes consumer welfare . . . by encouraging investment in the creation of desirable artistic . . . works of expression . . . in every case where a refusal to license a copyrighted work comes under attack.” *Id.* at 1187. The court, however, never explained precisely how the presumption could be rebutted, stating only that “there may be rare cases in which imposing antitrust liability is unlikely to frustrate the objectives of the Copyright Act.” *Id.* at 1187 n.64.

⁷¹ *Kodak II*, 125 F.3d at 1219.

⁷² *Id.*

⁷³ *Id.*

⁷⁴ *Id.*

⁷⁵ *Id.* at 1219-20.

⁷⁶ *Id.* at 1218.

As an initial matter, a “presumptively valid business justification” would apply to CureFinder’s refusal to license since the company is entitled to exclude its competitors in exploiting its patent to recover its development costs. But the question then would turn to whether this presumption would be rebutted on the grounds of pretext. Although such inquiries could conceivably be based on objective findings on a lack of business justification, they more frequently devolve into explorations of subjective intent. In other words, was CureFinder really relying on its patent in excluding CureCopier, or did it have an ulterior motive for the refusal to deal? If, for example, the court uncovers a statement of a company vice president announcing, “We must quash CureCopier at all costs,” the court could be tempted to rule for the plaintiff, since the refusal to license would appear to be motivated more by hurting CureCopier than by reaping the rewards of the patent system. Absent such a “smoking gun,” CureFinder could win, since there would be no apparent pretext to rebut the presumption. For reasons that will be explained in greater detail below,⁷⁷ focusing on a defendant’s subjective intent—where the goal of competition is to defeat one’s competitors, and the modus operandi of the patent laws is to exclude—presents significant concerns. In short, while the *Kodak II* rebuttable presumption wrestles with the reconciliation of the antitrust and intellectual property laws, the rebuttal, with its emphasis on pretext, fails to discern welfare-reducing activity.

3. *Intel*

The district court in *Intel*⁷⁸ demonstrated a third approach, one relying on the “essential facilities” doctrine. Intel is the world’s largest designer, manufacturer, and supplier of high-performance computer microprocessors, which are often described as the “brains” of a computer that control the central processing of data.⁷⁹ Intergraph used Intel microprocessors in the computer workstations that it developed and sold.⁸⁰ At one time, Intergraph manufactured microprocessors, but it then ceased production, converting its products to incorporate Intel’s microprocessors.⁸¹ It made this transition based on Intel’s as-

⁷⁷ See *infra* Part I.C.3 (explaining that intent tests prove too much in antitrust law, particularly where the challenged activity is based on intellectual property).

⁷⁸ 3 F. Supp. 2d at 1255.

⁷⁹ *Id.* at 1259.

⁸⁰ *Id.* at 1263.

⁸¹ *Id.* at 1264.

surances that its central processing units (CPUs) could support Intergraph's workstations and that it would supply its CPUs to Intergraph on fair terms.⁸² But when Intel developed its Pentium II microprocessors, it shifted away from the "open architecture" that it had made available to all participants in the industry and embraced a proprietary architecture.⁸³ As a result of this change, computers manufactured by original equipment manufacturers (OEMs) had to meet the technical requirements of the Intel architecture in order to use Intel microprocessors.⁸⁴ After this development, an unrelated patent dispute between the parties arose; as a result, Intergraph filed patent infringement claims against OEM customers of Intel. Intel responded by refusing to provide to Intergraph confidential information necessary for product development that it had previously provided.⁸⁵ Intergraph thus was not able to receive advance samples of Intel microprocessors and could not deploy its products at the same time that competitors could.⁸⁶

The court first found that Intel had a monopoly in markets for CPUs and in markets for Intel CPUs.⁸⁷ It then treated Intel's refusal to deal as the denial of an essential facility.⁸⁸ The essential facilities doctrine provides that a monopolist cannot deny to its competitors facilities that are necessary to compete in a particular market.⁸⁹ A plaintiff relying on the theory must show (1) control of the essential facility by the monopolist, (2) an inability to duplicate the facility, (3) the denial of the use of the facility, and (4) the feasibility of providing the facility.⁹⁰ The court found that "[r]easonable and timely access to critical business information that is necessary to compete is an essential facility."⁹¹ It then elevated the protection of competitors to a critical objective of the antitrust laws: "[A] monopolist's unilateral refusal to

⁸² *Id.*

⁸³ *Id.* at 1262.

⁸⁴ *Id.*

⁸⁵ *Id.* at 1267.

⁸⁶ *Id.* at 1269.

⁸⁷ *Id.* at 1275-76.

⁸⁸ *Id.* at 1278.

⁸⁹ *See, e.g.,* Otter Tail Power Co. v. United States, 410 U.S. 366, 377 (1973) (holding that an electric utility company could not prevent towns from using its transmission system after its retail electric power distribution franchise expired).

⁹⁰ *See, e.g.,* MCI Communications Corp. v. AT&T, 708 F.2d 1081, 1132-33 (7th Cir. 1982) (summarizing the four prongs of the essential facilities doctrine necessary to establish liability).

⁹¹ *Intel*, 3 F. Supp. 2d at 1278.

deal violates [Section] 2 of the Sherman Act where such conduct unreasonably handicaps competitors or harms competition.”⁹² The court concluded that Intel withheld an essential facility:

Intel’s refusal to supply advanced CPUs and essential technical information to Intergraph likely⁹³ violates [Section] 2 of the Sherman Act, because they are not available from alternative sources and cannot be feasibly duplicated, *and because competitors cannot effectively compete in the relevant markets without access to them.*⁹⁴

How would such a version of the essential facilities doctrine apply to CureFinder? A court applying this approach would consider the drug withheld by CureFinder to be essential to competition in the market for drugs curing the disease and potentially in markets for drugs treating related diseases. Any competitor, like CureCopier, that would be “unreasonably handicap[ped]” by the refusal to deal could make out an essential facilities claim under *Intel*. Just as the *Intel* court deemed “critical business information” to be an essential facility,⁹⁵ so too would it consider access to a drug to be essential to a competitor. Thus, CureFinder’s refusal to share such an “essential facility” with its competitors would violate Section 2.

Even though the *Intel* district court decision was vacated by the Federal Circuit on the ground that Intel and Intergraph were not competitors in any relevant market,⁹⁶ the approach (which has garnered attention in recent years) counsels considerable caution, as it could apply in any market in which a monopolist relies on intellectual property, with an excluded party claiming that the property is “essential” to compete in the market. Because this expansive version of the

⁹² *Id.*

⁹³ The court did not definitively find a substantive violation because it considered the issue in the context of a motion for a preliminary injunction. *Id.* at 1258.

⁹⁴ *Id.* at 1278 (emphasis added). The court also concluded that Intel “ha[d] no legitimate business reason to refuse to deal with Intergraph” since it had been a “loyal and beneficial customer” and the dispute over Intergraph’s patent claims “could [have been] resolved separately without Intel denying Intergraph information it need[ed].” *Id.* In addition, the court dismissed any defense based on intellectual property, finding that Intel “has no legitimate intellectual property basis with which it can refuse to supply Intel microprocessors and technical information to Intergraph.” *Id.* at 1279. Finally, the court found that Intel “unlawfully us[ed] its monopoly in the high-performance CPU relevant market to foreclose or restrain competition by Intergraph in the graphic subsystem relevant market.” *Id.* at 1278.

⁹⁵ *Id.*

⁹⁶ 195 F.3d 1346, 1357-58 (Fed. Cir. 1999); *see also id.* at 1358 (“The district court erred in holding that Intel’s superior microprocessor product and Intergraph’s dependency thereon converted Intel’s special customer benefits into an ‘essential facility’ under the Sherman Act.”).

essential facilities doctrine conflicts with standard antitrust principles of competition and promises to be overutilized in patent disputes (since competitors would be excluded by the very patent grant and since the product often will be helpful in the market), the *Intel* approach to the essential facilities doctrine raises serious questions.⁹⁷

4. *Microsoft*

The *Microsoft* case⁹⁸ has garnered widespread attention as a paradigmatic case of the application of antitrust to the “new economy.” While the lawsuit against the manufacturer of personal computer operating systems and Internet browsers challenges multiple practices, this Article will focus on the practice that, by its own terms, directly implicates the intersection of the antitrust and the intellectual property laws.⁹⁹

⁹⁷ For additional criticism of this doctrine, see Phillip Areeda, *Essential Facilities: An Epithet in Need of Limiting Principles*, 58 ANTITRUST L.J. 841 (1990). See also Abbott B. Lipsky, Jr., & J. Gregory Sidak, *Essential Facilities*, 51 STAN. L. REV. 1187, 1219 (1999) (“[E]ssential facilities principles are inherently inconsistent with intellectual property protection.”).

Another, more restrained, application of the essential facilities doctrine to intellectual property was provided by the court in *Data General Corp. v. Grumman Systems Support Corp.*, 761 F. Supp. 185 (D. Mass. 1991). In that case, the court dismissed an ISO’s claim that a manufacturer’s refusal to share a diagnostic tool to be used in repairing its product was an essential facility. *Id.* The court found that the advantages enjoyed by the manufacturer, such as earlier development of the diagnostic tool and contact with the owner of the product, represented only “historic accident—the natural benefit of being a manufacturer.” *Id.* at 191. The court concluded that the “‘bottleneck’ of . . . superior knowledge in the design of [the manufacturer’s product] is insufficient to invoke the essential facilities doctrine; a better mousetrap is not necessarily an essential facility.” *Id.* at 192. The court warned of the dangers of expanding the essential facilities doctrine:

If manufacturers of complex and innovative systems were required to share with competitors the development of accessories . . . the incentives of copyright and patent laws would be severely undermined. Not only would the manufacturer . . . have less incentive to [create accessories], but also the impetus for competitors to reverse engineer and produce competing solutions would be reduced.

Id.

⁹⁸ 87 F. Supp. 2d 30 (D.D.C. 2000) (conclusions of law). Although the appellate court reversed the district court on certain issues, it affirmed on the issue discussed in the text. 253 F.3d 34, 59-64 (D.C. Cir. 2001).

⁹⁹ Again, the copyright laws are not quite as strong as the patent laws. See *supra* note 29 (discussing why courts could conceivably not find an antitrust violation when a copyrighted—rather than patented—product is involved). So courts that do not defer to these (relatively weaker) laws most likely would not defer to the stronger patent grant.

One of Microsoft's requirements in distributing its Windows 95 operating system software provided that computer manufacturers could not modify the "first screen" that users see when turning on the computer for the first time.¹⁰⁰ Microsoft explained that the restriction was intended to "prevent OEMs from compromising the quality and consistency of Windows,"¹⁰¹ and to "ensure that all Windows users experience the product the way Microsoft intended it the first time they turn on their PC systems."¹⁰² The company alleged that the Copyright Act allowed it to "prevent licensees . . . from shipping modified versions of its product without its express permission."¹⁰³

The district court found that such a "right of integrity" did not appear in the Copyright Act and that Microsoft was not entitled to a defense to its "first screen" provision based on its intellectual property.¹⁰⁴ It dismissed Microsoft's arguments based on intellectual property on several grounds. First, it inquired whether copyright protection really was necessary: "the removal of the Internet Explorer icon and the promotion of [Netscape] Navigator in the boot sequence would not have compromised Microsoft's creative expression or interfered with its ability to reap the legitimate value of its ingenuity and investment in developing Windows."¹⁰⁵ Second, it questioned Microsoft's "true" purpose, claiming that "the contemporaneous Microsoft documents reflect concern with the promotion of Navigator rather than the infringement of a copyright."¹⁰⁶ Third, it distinguished the cases that upheld a right to integrity by explaining that they were "actions for infringement without antitrust implications [and so] are in-

¹⁰⁰ 84 F. Supp. 2d 9, 61 (D.D.C. 1999) (findings of fact).

¹⁰¹ *Id.* at 64. In its findings of fact, the court countered this explanation:

In truth, however, the OEM modifications that Microsoft prohibits would not compromise the quality or consistency of Windows any more than the modifications that Microsoft currently permits. Furthermore, to the extent that certain OEM modifications did threaten to impair the quality and consistency of Windows, Microsoft's response has been more restrictive than necessary to abate the threat.

Id.

¹⁰² *Id.* at 65; *see also id.* ("[A]fter all, there would be little incentive to develop a high-quality operating-system product if OEMs were free to alter it for the worse before handing it over to consumers.").

¹⁰³ 87 F. Supp. 2d at 40 (conclusions of law).

¹⁰⁴ *Id.*

¹⁰⁵ 84 F. Supp. 2d at 66 (findings of fact).

¹⁰⁶ *Id.*; *see also* 87 F. Supp. 2d at 41 (conclusions of law) (discussing the measures Microsoft took to increase usage share for Internet Explorer at the expense of Navigator).

apposite.”¹⁰⁷ Fourth, it subordinated intellectual property to antitrust: “a copyright holder is not by reason thereof entitled to employ the perquisites in ways that directly threaten competition.”¹⁰⁸

The D.C. Circuit affirmed the district court on this issue. Without analyzing the copyright laws, it quickly dismissed Microsoft’s copyright argument as “frivolous.”¹⁰⁹ Although it reasonably refused to accept Microsoft’s intellectual property-centric version of the antitrust laws—by which the exercise of lawfully acquired intellectual property rights “cannot give rise to antitrust liability”¹¹⁰—it responded with a contrary blanket assertion that “[i]ntellectual property rights do not confer a privilege to violate the antitrust laws.”¹¹¹

These responses belie the purposes of the system of intellectual property. The district court, for example, questioned the company’s business judgments in relying on copyrights; looked for true purposes in the wreckage wrought by the exclusion lying at the heart of the intellectual property laws; drew meaningless distinctions with analogous cases (i.e., whether antitrust claims are part of a lawsuit has no bearing on the policies supporting a right of integrity); and ignored the fundamental nature of the intellectual property laws, which, by definition, promote welfare *through exclusion*. Many acts based on a patent or copyright could be characterized as “threaten[ing] competition.” In short, the district court improperly failed to take account of the purposes underlying the intellectual property laws.¹¹²

¹⁰⁷ 87 F. Supp. 2d at 40 n.2 (conclusions of law).

¹⁰⁸ *Id.* at 40.

¹⁰⁹ 253 F.3d 34, 63 (D.C. Cir. 2001).

¹¹⁰ *Id.*

¹¹¹ *Id.* (citing *Xerox*, 203 F.3d 1322, 1325 (Fed. Cir. 2000)). It bears particular irony that the court cited the patent-friendly *Xerox* case for this proposition.

¹¹² Just as ominous, the court tied anticompetitive effect to anticompetitive purpose: “Even constitutional privileges confer no immunity when they are abused for anticompetitive purposes.” *Microsoft*, 87 F. Supp. 2d at 41 (conclusions of law). Focusing on intent is not the answer in resolving the intellectual property-antitrust conflict. *Infra* Part I.C.3.

Another example of a case that emphasized antitrust law at the intersection was provided by the Federal Circuit in *C.R. Bard, Inc. v. M3 Systems, Inc.*, 157 F.3d 1340 (Fed. Cir. 1998). In this case, the court found that a monopolist’s modification of its product that offered improvements upon the original product violated Section 2 where it created less compatibility with unpatented complementary assets produced by competitors. *Id.* at 1382. The court dismissed the defendant’s argument that the change constituted an improvement, instead emphasizing subjective evidence—that the “real reasons” for modification were to harm competitors. *Id.*

A more nuanced approach was presented in *Mannington Mills, Inc. v. Congoleum Industries, Inc.*, 610 F.2d 1059, 1070 (3d Cir. 1979), in which the Third Circuit recog-

This approach would punish CureFinder and would diminish the incentives underlying the patent system.¹¹³ “True purposes” for CureFinder’s refusal to license would be divined, business judgments to exploit patents by refusing to deal with competitors would be questioned, and the right to exclude that forms the foundation of the patent system would be weakened severely. The *Microsoft* approach likely would result in a finding that CureFinder committed a Section 2 violation based on a suspicious-looking refusal to deal, with a blind eye cast to the incentives underlying the patent system.

* * *

In conclusion, the *Xerox*, *Kodak II*, *Intel*, and *Microsoft* courts reveal an array of disparate approaches to the patent-antitrust intersection. The courts are representative in running the gamut from patent immunity to antitrust preeminence. But despite their broad differences, none of the courts addresses the fundamental question of how to reconcile two very different paths to increased welfare. And none of the tests seems entirely satisfactory in analyzing CureFinder’s refusal to license. The next Section will introduce the work of commentators in broadly surveying the landscape of approaches that have been applied to the patent-antitrust intersection.

C. Proposed Solutions Deconstructed

Although courts and commentators have attempted to resolve the paradox presented by the intersection of the patent and antitrust laws, none has offered a satisfactory approach that could be used to analyze a monopolist’s patent-based actions.¹¹⁴ This Section will evaluate six

nized that analyzing the patent-antitrust intersection requires “weigh[ing] the potential injury to competition . . . against the risk that the application of antitrust sanctions will frustrate the purposes of the patent system.” The court also explored the economic effects of licensing in antitrust markets and held that when a patentee’s restriction upon a licensee “results primarily in benefits for the licensee[] rather than the patentee, the anticompetitive restriction cannot be justified as a subsidy for the patentee’s inventive activity.” *Id.* at 1071. Even if it may not always be obvious for whose primary benefit a restriction is imposed, the court nonetheless deserves credit for beginning to address the difficult issues in the intersection.

¹¹³ If the *Microsoft* court refused to defer to the relatively less potent copyright, it likely would not have deferred to the stronger patent that CureFinder refused to license.

¹¹⁴ This Article will examine proposed solutions to the patent-antitrust intersection. The problem of overly strong patent rights also has engaged commentators who have recommended adjusting the patent laws. *See generally* Julie E. Cohen & Mark A.

approaches. Three of the attempts are characterized by formalistic analysis that leads to easy answers but fails to grapple with either the tension between the systems or their effects on welfare in particular cases. These approaches focus on the scope of the patent, the markets affected by the activity, and the intent of the defendant. The other three approaches, offered by respected commentators William Baxter, Ward Bowman, and Louis Kaplow, present more nuanced economic analyses—indeed, the most sophisticated constructs that have been offered to date. But despite their significant contributions, these solutions neglect certain relevant considerations, avoid industry-specific analysis, and fail to provide courts with administrable tests.

1. Scope of the Patent

The courts' most popular solution to the patent-antitrust conflict is centered on the "scope" of the patent. Throughout the past century and even now, courts have held that a patentee's actions within the scope of the patent are immune from antitrust scrutiny, while those outside the scope are invalid.¹¹⁵ Scope traditionally has been circum-

Lemley, *Patent Scope and Innovation in the Software Industry*, 89 CAL. L. REV. 1 (2001) (advocating narrower patent scope in software industry); O'Rourke, *supra* note 29 (proposing fair use defense for patent law). Another project worth considering, but beyond the scope of this Article, would involve the extrapolation of more flexible copyright doctrines such as those introduced above, *see supra* note 29 (discussing fair use defense, idea-expression dichotomy, and merger doctrine), to the patent-antitrust intersection.

¹¹⁵ *See, e.g.*, *Zenith Radio Corp. v. Hazeltine Research, Inc.*, 395 U.S. 100, 136 (1969) ("[A patentee] may not condition the right to use his patent on [a] licensee's agreement to purchase, use, or sell, or not to purchase, use, or sell, another article of commerce not within the scope of his patent monopoly."); *Ethyl Gasoline Corp. v. United States*, 309 U.S. 436, 456 (1940) (holding that the patentee's right "to exclude all others from manufacturing, using, or selling his invention . . . is limited by the definition of his invention, as its boundaries are marked by the specifications and claims of the patent"); *Motion Picture Patents Co. v. Universal Film Mfg. Co.*, 243 U.S. 502, 510 (1917) ("The patent law simply protects [the patentee] in the monopoly of that which he has invented and has described in the claims of his patent."); *Xerox*, 203 F.3d at 1327-28 (noticing the "undisputed premise that the patent holder cannot use his statutory right to refuse to sell patented parts to gain a monopoly in a market beyond the scope of the patent" (emphasis omitted)); *United States v. Studiengesellschaft Kohle, m.b.H.*, 670 F.2d 1122, 1134-35 (D.C. Cir. 1981) (distinguishing the facts of the case from situations in which "the patentee threatened to extend its monopoly beyond those rights accruing under the patent"); *United States v. Westinghouse Elec. Corp.*, 648 F.2d 642, 647 (9th Cir. 1981) (listing examples of activity in which "the offending patentee seeks to do more than enjoy the limited monopoly granted by the patent laws"); *SCM Corp. v. Xerox Corp.*, 645 F.2d 1195, 1206 (2d Cir. 1981) ("[W]e hold that where a patent has been lawfully acquired, subsequent conduct permissible under the patent laws cannot trigger any liability under the antitrust laws."). For examples of

scribed by the claims listed in the specification in the patent application.¹¹⁶

At first, this construct may seem to make some intuitive sense. For if the challenged act is not within the scope of the grant, then it does not promote the purposes of the patent system. Inventions that are novel, nonobvious, and useful enough to receive a patent are the intended target of the incentives underlying the patent laws.¹¹⁷ The application of the antitrust laws to weaken the patent grant in these cases could adversely affect incentives for future invention in a way that the

commentators who also have offered solutions based on the scope of the patent, see LAWRENCE ANTHONY SULLIVAN, *HANDBOOK OF THE LAW OF ANTITRUST* 531 (1977); Richard M. Buxbaum, *Restrictions Inherent in the Patent Monopoly: A Comparative Critique*, 113 U. PA. L. REV. 633, 641-45 (1965); and John C. Stedman, *Patents and Antitrust—The Impact of Varying Legal Doctrines*, 1973 UTAH L. REV. 588, 595.

¹¹⁶ According to the statute:

The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same, and shall set forth the best mode contemplated by the inventor of carrying out his invention.

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

35 U.S.C. § 112 (1994).

¹¹⁷ It is possible that an act *within* the scope of a patent does not promote maximum incentives to innovate because either (a) the patent was mistakenly granted based on an incorrect application of the criteria for patentability or (b) the criteria themselves do not promote the ideal level of incentives. Focusing attention on the process by which patents are granted, including challenges facing the U.S. Patent and Trademark Office (PTO), could decrease the likelihood of the first error. In contrast, there is no simple answer to the second error.

For example, determining the appropriateness of even a partial modification to the patent system, such as an increase in patent scope or duration, involves numerous steps. These steps require the calculation of: (1) the effect of the modification on the expected profit (in present value terms) of those investing in research and development (R&D) and innovation; (2) which increases the amount of funds invested in R&D; (3) which raises productive (i.e., human) resources allocated to R&D; (4) which raises the output of novel and useful technological ideas; (5) which leads to an increase in the rate of actual execution of innovations; (6) which raises the productivity of resources; (7) which increases the gross national product; and (8) which is offset by the reduction from output restrictions. SUBCOMM. ON PATENTS, TRADEMARKS, AND COPYRIGHTS OF THE SENATE COMM. ON THE JUDICIARY, 85TH CONG., AN ECONOMIC REVIEW OF THE PATENT SYSTEM, STUDY NO. 15, at 65 (Comm. Print 1958) (authored by Fritz Machlup); see also Baxter, *supra* note 1, at 271 (listing the benefits and costs to making a marginal change to the patent grant). The length of this chain and lack of precision of each of the links reveal the difficulty of measuring the effect of even incremental modifications to the patent system. For a discussion of the relationship between patent-antitrust doctrine and the optimal patent life, see *infra* note 333.

application to acts not covered by the claims of the patent application would not.

But upon reflection, the simplicity of this initial construct becomes apparent. For the test really just “solves” the conflict by elevating patent over antitrust. If the act is within the scope of the patent, then it is automatically lawful. Q.E.D. While this resolution will often promote the purposes of the patent laws (at least for initial, as opposed to “follow-on,” inventors), it leaves no room for antitrust to offer its version of promoting welfare. It cannot be the answer to say that only the patent laws should be enforced in the attempt to increase welfare.¹¹⁸

Analysis based on the scope of the patent also fails to recognize industry-specific variations in achieving welfare. For example, the test does not allow for differentiated analysis between industries in which patents are essential for innovation (e.g., chemicals) and industries in which competition (and not patents) is essential for innovation (e.g., computer software).¹¹⁹ The bluntness of the scope test serves to reinforce the primacy of patents at the patent-antitrust intersection, which is of particular concern in industries in which patents are not necessary for innovation.

Moreover, the test begs the question of exactly what conduct falls within the scope of the patent. This is not an easy inquiry. In fact, the key issue in many patent infringement lawsuits centers on whether an alleged infringer’s product lies within the scope of the patent, with each party articulating different conceptions—patentee claiming broad, infringer claiming narrow—of the scope of the patent. The flexibility of the concept of patent scope provides yet additional impetus for the primacy of patents under the test.

Finally, as explained more fully in the next Section, courts can utilize the concept of patent scope to rationalize particular market definitions. The determination of the boundaries of relevant markets is quite flexible, and the temptation to superimpose inapt concepts of patent scope onto market boundaries reveals additional apprehension

¹¹⁸ While the “scope” test does not provide the solution to the patent-antitrust intersection, particularly for refusals to deal, it could conceivably be of some assistance in “tying” claims in shedding light on issues relating to coercion and the number of products involved.

¹¹⁹ For a fuller explication of these ideas, see *infra* Part III. Patents could be issued in industries in which they are not essential to innovation as long as the requirements for patentability—subject matter, novelty, utility, nonobviousness, and enablement—are satisfied.

with the scope test.

2. Multiple Markets

A second test looks to the “markets” affected by the intellectual property grant. Some courts and commentators have contended that if the monopolist’s challenged activity occurs in the same antitrust market as that contemplated by the intellectual property, then the action should be lawful, but if the act occurs in a second market, it should not be lawful.¹²⁰

There are several concerns with such a test. First, it tempts courts to analyze scope under the guise of markets. Market definition is often an uncertain task, as the array of goods or services that consumers view as economic substitutes may not be obvious.¹²¹ Consequently, notions of seemingly unquestionable, exogenously defined patent scopes could be viewed as lending an added imprimatur to courts’ conclusions on market definitions. Yet patents typically do not demonstrate market power, and the set of technological substitutes that cannot be practiced because of the patent grant often has little overlap with the set of products that consumers view as economic substitutes.¹²² Impor-

¹²⁰ See, e.g., *Kodak I*, 504 U.S. at 479 n.29 (“[P]ower gained through some natural and legal advantage such as a patent, copyright, or business acumen can give rise to liability if ‘a seller exploits his dominant position in one market to expand his empire into the next.’” (quoting *Times-Picayune Publ’g Co. v. United States*, 345 U.S. 594, 611 (1953))); Marina Lao, *Unilateral Refusals to Sell or License Intellectual Property and the Antitrust Duty to Deal*, 9 CORNELL J.L. & PUB. POL’Y 193, 217-18 (1999) (“There should be no need to give the monopolist additional incentives by permitting the leveraging of its power in that antitrust market . . . through a refusal to license its intellectual property to its competitors in the second market.”); David A. Schnider, *Licensed to Kill?: The Battle Between Patent and Antitrust in Monopoly Leveraging Cases*, 20 HASTINGS COMM. & ENT. L.J. 857, 876 (1998) (discussing patentholders’ “violat[ion of] the spirit of the patent law” when they use the “unique competitive advantage [provided by the patent laws] to try to expand their monopoly into downstream markets”). Also:

There is a simple formula that will ensure that the purposes of [the antitrust and patent] statute[s] are fulfilled. Where there is one market involved, a patent and/or copyright holder has the exclusive right to exploit his invention. However, where two markets exist and the patent or copyright holder seeks to extend his “legal monopoly” into the second market, antitrust liability is likely.

Ronald S. Katz et al., *Intellectual Property v. Antitrust: A False Dilemma*, in ANTITRUST/INTELLECTUAL PROPERTY CLAIMS IN HIGH TECHNOLOGY MARKETS 1, 1 (A.L.I.-A.B.A. Course of Study Materials, No. SD72, 1999).

¹²¹ See, e.g., MILTON HANDLER ET AL., *TRADE REGULATION: CASES AND MATERIALS* 210 (4th ed. 1997) (“In theory and practice, relevant market definition is as difficult an undertaking as any in antitrust.”).

¹²² See Dam, *supra* note 7, at 250 (“[L]eading companies may obtain 1,000 or more

tations of patent scope into market definition would overstate the actual market power of patentees, who naturally would have monopoly power in markets circumscribed by patent scope.¹²³ Such a maneuver also would expose the patentee to claims of invalid extensions of the patent grant if the product at issue includes nonpatented in addition to patented elements.¹²⁴ This type of analysis also lapses back into courts' earlier misconceived notions that patents automatically confer monopoly power.¹²⁵

Second, even if the "multiple markets" test serves, in some cases, as a proxy for welfare-reducing activity, it is an imperfect proxy.¹²⁶ Patents could, in some instances, be mapped onto more than one antitrust market. Because patents only claim inventions, the patent-holder could prevent each use of the invention in every antitrust market in which it is used (or not used).¹²⁷ For example, the patent could implicate manufacturing, retail, and service markets.¹²⁸ But even if a

patents in a single year, and yet many such firms are unlikely ever to obtain even a single monopoly in any market." (footnotes omitted)); Gallini & Trebilcock, *supra* note 11, at 22 ("[I]n a survey of [patent] licensors, there were no close substitutes [for the patented product] in only 27 percent of cases; whereas in over 29 percent of cases, they had more than 10 competitors."); Edmund W. Kitch, *Elementary and Persistent Errors in the Economic Analysis of Intellectual Property*, 53 VAND. L. REV. 1727, 1729-38 (2000) (criticizing "erroneous" assertion by commentators that intellectual property rights are economic monopolies).

¹²³ See *Image Technical Servs., Inc. v. Eastman Kodak Co.*, 125 F.3d 1195, 1206 (9th Cir. 1997) (concluding that Kodak has "100% monopoly shares for certain parts" used to repair Kodak copiers).

¹²⁴ A narrow patent-determined "aftermarket" definition also will deflect attention from what may often be a competitive primary market.

¹²⁵ See *supra* note 35 (noting courts that presumed monopoly power based on the existence of a patent).

¹²⁶ Admittedly, a party's use of power in the market in which it has a monopoly to (at least) attempt to gain a monopoly in a second market may raise concerns. But any such concerns do not *automatically* warrant the conclusions that the full breadth of the patent should not be protected and that the application of Section 2 would increase welfare.

¹²⁷ *In re Indep. Serv. Orgs. Antitrust Litig. ("Xerox")*, 989 F. Supp. 1131, 1136 (D. Kan. 1997); see also James C. Burling et al., *The Antitrust Duty to Deal and Intellectual Property Rights*, 24 J. CORP. L. 527, 540 (1999) ("[L]everaging does not exist 'when a patent holder merely exercises its rights inherent in the patent grant.'" (footnote omitted)).

¹²⁸ *Xerox*, 989 F. Supp. at 1136; see also *id.* at 1138 ("The reward for a patented invention is the right to exploit the entire field of the 'invention,' not the right to exploit the single most analogous antitrust market."). Similarly, copyright owners' activities relating to the reproduction, distribution, performance, and display of their works often occurs in more than one antitrust market, and the right to prepare derivative works reserves to copyright owners returns from markets other than those in which the copyrighted work was first published. See 17 U.S.C. § 106 (1994) (listing rights of copyright owners); Paul Goldstein, *Derivative Rights and Derivative Works in Copyright*, 30 J.

patented product covers more than one antitrust market, the incentives to invent are no less than in the one-market case.¹²⁹ Since patentees will not know how their invention ultimately will be used by the consumer, they should not be punished merely because their activity occurs in a second market.¹³⁰

Third, the “multiple markets” test is blind to differences among types of markets and industries. The catalyst for welfare-enhancing activity may vary in different markets, a point neglected in a test that looks solely to the number of markets implicated. Thus, the test operates inflexibly, as it fails to consider, for example, the importance of patents or competition in increasing welfare in particular markets or industries. Moreover, welfare can be reduced more by broad patents in a market in which invention occurs in a cumulative fashion than by narrow patents in multiple markets with discrete invention.¹³¹

3. Monopolist’s Intent

A third test aims to reconcile the patent and antitrust laws by focusing on the intent of the monopolist. The Ninth Circuit in *Kodak II*,¹³² for example, concluded that a monopolist’s reliance on its intellectual property-protected products is presumptively lawful but can be rebutted based on evidence of pretext.¹³³ The court explained that a monopolist cannot “rely upon a pretextual business justification to

COPYRIGHT SOC’Y 209, 209 (1983) (documenting the expansion in copyright law to “protect[] against uses and media that often lie far afield from the original”).

¹²⁹ In fact, “many patented and copyrighted works . . . are developed to exploit multiple business opportunities” and might not be developed if the creation could be utilized in only one market. Daniel M. Wall & Charles S. Crompton, III, *The Antitrust and Intellectual Property Law Issues: Exploiting Computer Software Copyrights in Multiple “Markets”*, 8 ANTITRUST 19, 23 (1994) (emphasis omitted); see also *id.* (explaining that a copyrighted work “will inevitably be used in conjunction with other goods and services that the copyright holder can or does offer”).

¹³⁰ See *Xerox*, 989 F. Supp. at 1136 (“If the threat of treble damage liability for refusing to license were imbedded in the minds of potential patent holders as a likely prospect incident to every successful commercial exploitation of a patented invention, the efficacy of the economic incentives afforded by our patent system might be severely diminished.” (quoting *SCM Corp. v. Xerox Corp.*, 645 F.2d 1195, 1206 (2d Cir. 1981))).

¹³¹ *Infra* Part III.B.2.

¹³² 125 F.3d 1195, 1219 (9th Cir. 1997). For a discussion of this case, see *supra* Part I.B.2.

¹³³ See also, e.g., Thomas A. Piraino, Jr., *Identifying Monopolists’ Illegal Conduct Under the Sherman Act*, 75 N.Y.U. L. REV. 809, 845 (2000) (advocating a Section 2 standard based on the “substantive competitive purpose” of the monopolist).

mask anticompetitive conduct.”¹³⁴ Although issues of pretext could theoretically be resolved based on objective criteria—such as a lack of any conceivable business justification for the action—they typically will be resolved by examining the defendant’s subjective intent.

There are manifest difficulties in centering analysis on the defendant’s intent. Speaking broadly, intent tests often prove too much in antitrust law. The whole purpose of competition is to defeat one’s competitors.¹³⁵ Documents, e-mails, or statements of vanquishing one’s rivals—inflammatory as they may be, as the *Microsoft* trial revealed—often show no more than healthy competition.

Particularly worrisome here, penalizing a defendant for its intent in refusing to deal, when the very purpose of the patent laws is to exclude others from the patented product, does not make sense.¹³⁶ Firms invent with the hope that they will prevail over their rivals, with the right to exclude being essential to this motivation.¹³⁷ The “carrot” of exclusion offered by patents will wither away if patentees have to thread an illusory needle between excluding under the patent laws and not excluding for unlawful reasons under the antitrust laws.

A focus on intent also suffers from peripheral problems. What counts as a company’s “intent”? Statements from vice presidents? Lower-level managers? What of conflicting “intents”?¹³⁸ Moreover, there will always be the concern that documentation of beneficent intent will be made with an eye toward future litigation.

Three commentators have offered additional, more economically oriented, constructs for analyzing the patent-antitrust intersection.

¹³⁴ *Kodak II*, 125 F.3d at 1219.

¹³⁵ See, e.g., Herbert Hovenkamp, *The Monopolization Offense*, 61 OHIO ST. L.J. 1035, 1039 (2000) (“[A]ny competitively energetic firm ‘intends’ to prevail over its actual or potential rivals.”).

¹³⁶ See *Xerox*, 989 F. Supp. at 1141 (“To classify the desire to obtain a competitive advantage over competitors as pretext is to read the right to exclude out of the patent statute.”), quoted in Burling et al., *supra* note 127, at 541; David McGowan, *Networks and Intention in Antitrust and Intellectual Property*, 24 J. CORP. L. 485, 514 (1999) (“[E]xclusion is the entire point of [intellectual property] rights.”).

¹³⁷ See 3 PHILLIP E. AREEDA & HERBERT HOVENKAMP, *ANTITRUST LAW: AN ANALYSIS OF ANTITRUST PRINCIPLES AND THEIR APPLICATION* ¶ 705b, at 156 (rev. ed. 1996) (stating that “no commercial firm invents except with the hope of prevailing over its rivals”).

¹³⁸ Moreover, the question of intent is, by its nature, fact-specific. The issue thus will frequently provide the only reed on which the plaintiff can rely in surviving a motion to dismiss or for summary judgment. Such a result, which would increase the costs of litigation, could further diminish the incentives for innovation.

4. Baxter's "Comparability" Test

William Baxter offers a "comparability" test that provides that "a patentee is entitled to extract monopoly income by restricting utilization of his invention" as long as the restriction is confined "as narrowly and specifically as the technology of his situation and the practicalities of administration permit."¹³⁹ Baxter wisely avoids reliance on more conclusory tests, like the purpose of the patentee or the direct nature of the restraint.¹⁴⁰ And his test recognizes that other goods and services might be affected by the exploitation of the patent.¹⁴¹

But in requiring that the restrictions imposed by the patentee be confined "as narrowly and specifically" as possible,¹⁴² the test chips away at the bundle of patent rights without considering the net benefit to society of the patent.¹⁴³ In other words, it emphasizes antitrust law—in particular, the minimization of monopoly loss—while downplaying concepts of patentee reward and inventive activity.¹⁴⁴

Such a test naturally leads to post hoc second-guessing of the licensing practice utilized by the patentee. Similar to the "less restrictive alternatives" analysis that antitrust courts use in considering the validity of agreements under the Rule of Reason—by which courts always can unearth a less restrictive alternative than the restraint invoked¹⁴⁵—courts invariably can question licensing restrictions, opining that they could have been even narrower. This concern is heightened based on the flexibility of the factors that courts are to consider under Baxter's test, from "the technology of [the patentee's] situation" to "the practicalities of administration."¹⁴⁶

The test also recalls analysis based on the scope of the patent: if the activity is confined "narrowly and specifically enough"¹⁴⁷—in other

¹³⁹ Baxter, *supra* note 1, at 313.

¹⁴⁰ *Id.*

¹⁴¹ *See id.* (explaining that "a patentee is entitled to extract monopoly income by restricting utilization of his invention, notwithstanding that utilization of other goods and services are consequently restricted").

¹⁴² *Id.*

¹⁴³ Baxter's test is not the only one to "favor" antitrust at the patent-antitrust divide. For additional examples, see SULLIVAN, *supra* note 115, at 509; Gerald R. Gibbons, *Price Fixing in Patent Licenses and the Antitrust Laws*, 51 VA. L. REV. 273, 296 (1965); and Donald F. Turner, *The Patent System and Competitive Policy*, 44 N.Y.U. L. REV. 450, 459, 461 (1969).

¹⁴⁴ Kaplow, *supra* note 1, at 1853-54.

¹⁴⁵ Carrier, *supra* note 19, at 1336-38.

¹⁴⁶ Baxter, *supra* note 1, at 313.

¹⁴⁷ *Id.*

words, it appears not to extend too far beyond the patent grant—then it is acceptable. As discussed above,¹⁴⁸ however, the issue of patent scope is frequently disputed, not exogenously defined, and susceptible to confusion with market boundary determinations.

Finally, the test introduces substantial administrability problems. For every challenged licensing agreement in every industry, courts must examine the relevant “technology” and “practicalities of administration” in determining whether the particular type of restriction utilized by the patentee is excessive.¹⁴⁹

5. Bowman’s “Competitive Superiority” Test

Ward Bowman’s “competitive superiority” test allows a patentee to utilize a restrictive practice if the reward to the patentee measures “the patented product’s competitive superiority over substitutes.”¹⁵⁰ While such a test recognizes the benefits produced by the patent system and the role played by profit maximization, it does not calculate the *net* effect of a patent’s competitive superiority. In other words, the cost of the patent system—in the form of monopoly loss that accompanies patentees’ elimination of competition—is not considered. For example, Bowman considers a licensee’s payment to a patentee as evidence of the competitive superiority of the license (if it were not superior, so the argument goes, the licensee would not agree to it) without considering the costs concomitantly imposed by the patentee.¹⁵¹

Bowman also accords substantial weight to the scope of the patent, stating that the evaluation of licensing practices “will involve the proper scope of the legal monopoly.”¹⁵² Consequently, practices will be upheld if they “merely maximiz[e] the reward attributable to the competitive advantage afforded by a patent” but prohibited if “more [is] being monopolized than what the patent grants.”¹⁵³ Again, the issue of patent scope does not provide the answer to the patent-antitrust

¹⁴⁸ See *supra* Part I.C.1 (discussing problems with reliance on the concept of patent scope).

¹⁴⁹ Baxter, *supra* note 1, at 313.

¹⁵⁰ BOWMAN, *supra* note 1, at x.

¹⁵¹ *Id.* at 88. In addition, the determination of the patent’s competitive superiority over substitutes threatens to be plagued by problems of administration.

¹⁵² *Id.* at 8-9.

¹⁵³ *Id.* at 9; see also *id.* at 240 (criticizing the Supreme Court, which has failed to articulate a “careful distinction between monopoly maximization and monopoly extension”).

conflict.¹⁵⁴ Because of the emphasis on patent scope and the failure to consider the costs of the patent monopoly, Bowman's test fails to accord a sufficient role to antitrust.¹⁵⁵

6. Kaplow's "Ratio" Test

Louis Kaplow's "ratio" test is the most comprehensive analysis to date of the patent-antitrust intersection. The test examines the ratio between "the reward the patentee receives when permitted to use a particular restrictive practice" and "the monopoly loss that results from such exploitation of the patent."¹⁵⁶ Licensing practices with higher ratios "generally should be preferred."¹⁵⁷ This formulation solves many of the problems of the Baxter and Bowman approaches.¹⁵⁸ As opposed to the Baxter analysis, which focuses on the monopoly loss accompanying a licensing practice, and the Bowman test, which emphasizes the gross benefit of the patented product, Kaplow's "ratio" test addresses both halves of the equation. It thereby offers the most nuanced and rigorously developed approach to the patent-antitrust intersection.

As elegant as the Kaplow test is, however, it is not perfect. First, the level on which it analyzes the challenged practice is too specific to be applied practically. Second, the goal of social welfare that serves, in effect, as the common denominator of the analysis also limits the test's applicability. Third, the input the test seeks to maximize is patentee reward rather than inventive activity.¹⁵⁹

First, Kaplow's test applies at the most specific level possible: the licensing agreement. The inputs making up the ratio, patentee reward and monopoly loss, must be determined with reference to particular agreements.¹⁶⁰ As Kaplow concedes, "various kinds of informa-

¹⁵⁴ See *supra* Part I.C.1 (discussing the inherent problems with the issue of patent scope).

¹⁵⁵ Kaplow notes that Bowman's test focuses only on the numerator of his own "ratio": the patentee's reward. Kaplow, *supra* note 1, at 1851.

¹⁵⁶ *Id.* at 1816.

¹⁵⁷ *Id.* at 1842.

¹⁵⁸ See *supra* Parts I.C.4-5 (discussing Baxter's "comparability" test and Bowman's "competitive superiority" test).

¹⁵⁹ The remainder of this Section expands on these difficulties with the Kaplow test. For a discussion of how the approach proposed by this Article solves many of these concerns, see *infra* note 333.

¹⁶⁰ See Kaplow, *supra* note 1, at 1831-32 ("'[P]atentee reward' and 'monopoly loss' refer, respectively, to the incremental reward and loss resulting from the practice in question." (emphasis omitted)).

tion needed for the analysis will not generally be available.”¹⁶¹ To ascribe particular numbers for patentee reward and monopoly loss and to arrive at ratios that dictate antitrust treatment of the practice is, admits Kaplow, “a most formidable and controversial endeavor.”¹⁶² If the project is this difficult for economists, it is impossible for courts. That no court has attempted to apply the test in eighteen years illustrates this point. In seeking to analyze the composition of each grain of sand on the beach of social welfare—rather than, for example, an approach that groups different sections of the beach with different characteristics (like white sand, gold sand, and rocks) into more assessable categories—the test is limited to the level of the hypothetical theorem.

Second, to the extent Kaplow offers a common denominator, it is total social welfare.¹⁶³ The effect of an individual agreement on total welfare is determined by comparing the reward to the patentee with the monopoly loss resulting from the agreement.¹⁶⁴ Social welfare is a polycentric concept with numerous inputs, and Kaplow’s version confronts hurdles in the interdependence among cases considered by courts. Courts “cannot hope to articulate a coherent patent-antitrust doctrine by proceeding on a case-by-case basis,”¹⁶⁵ contends Kaplow, because of the effects of each decision on related cases. In particular, “it is wholly indeterminate how any individual case or, similarly, any single component of patent-antitrust doctrine should be decided, because the question is whether the *totality* of the courts’ patent-antitrust decisions” promotes an appropriate level of reward.¹⁶⁶ The comprehensiveness of Kaplow’s social welfare calculi limits their prac-

¹⁶¹ *Id.* at 1842.

¹⁶² *Id.* at 1833.

¹⁶³ *See id.* at 1816, 1889 (offering “economic welfare loss” as a common denominator).

¹⁶⁴ *Id.* at 1831.

¹⁶⁵ *Id.* at 1844.

¹⁶⁶ *Id.* at 1820. Similarly, “setting the patent life and determining patent-antitrust doctrine are interdependent endeavors; in other words, the system of equations that defines the optimization process must be solved simultaneously.” *Id.* at 1840. The tasks overlap, according to Kaplow, because adjustments in patent-antitrust doctrine produce different levels of reward for any particular patent life, thus necessitating an adjustment of the optimal patent life. *See id.* at 1839 (explaining that an adjustment in patent-antitrust doctrine leading to a greater reward ought to reduce the patent life). This problem of the endless loop likely would apply (at least in theory) even if a more narrow common denominator, such as innovation, were utilized. *See infra* note 333 for a discussion of why the common denominator of innovation might not completely eliminate these endless loop problems.

tical applicability. A narrower common denominator—for example, one that is important in increasing welfare but less expansive, like innovation—might not open this Pandora’s box.¹⁶⁷

Third, Kaplow’s test seeks to maximize the reward to the patentee. Kaplow recognizes that patentee reward is not the end goal of the patent system; rather, it is the means to (initially) increased inventive activity and (ultimately) benefits to society.¹⁶⁸ Kaplow stops at the level of patentee reward, however, because of the impossibility of proceeding further under his analysis. He cannot reach the stage of increased invention because he does not know “the identity of the patentee,” in particular, the patentee’s familiarity with the inventive process and specific antitrust restrictions.¹⁶⁹ And he cannot reach the ultimate stage of benefit to society because this is tied to the impracticable task of determining the optimal patent length. Thus, under Kaplow’s analysis, the only end product to maximize is patentee reward. As he puts it, “fruitful analysis of the patent-antitrust problem may require the simplifying assumption that all reward has the same incentive effect.”¹⁷⁰ Cutting short the chain from patentee reward through inventive activity to benefit to society at the first step, however, shortchanges the objectives of the patent laws. Patentee reward is not the objective of the patent system but is only a means to increase invention and innovation. Even if the elusive calculation of ultimate benefit to society cannot be made, the omission of the link between patentee reward and invention is disconcerting, particularly in industries in which patents are not critical to innovation.

* * *

The Baxter, Bowman, and Kaplow approaches each articulate thoughtful economic constructs that address many of the difficult issues in the patent-antitrust intersection. But there is room for a new paradigm, not only because of the concerns raised in the previous sections, but also because of weaknesses all three approaches share when applied to an examination of monopolists’ patent-based actions.

First, all of the tests pose substantial administrability problems. Economic approaches, with their seeming precision in theory, are

¹⁶⁷ See *infra* note 333 for a discussion of how the common denominator of innovation avoids some of the interdependency problems.

¹⁶⁸ Kaplow, *supra* note 1, at 1823.

¹⁶⁹ *Id.* at 1839.

¹⁷⁰ *Id.*

helpful in ordering and weighing relevant factors but will often be extremely difficult (if not impossible) to apply in practice. Not only are the particular inputs usually unmeasurable, but any calculation of ratios among these inputs quickly spirals out of the realm of plausibility. Compounding the problem is the recognition that it is courts that are charged with these tasks, which further diminishes the likelihood that such approaches will be adopted or effectively applied.

Second, none of the tests recognizes industry-specific differences that affect the achievement of social welfare. All three approaches reside simultaneously on a theoretical level (in which each argues from global understandings about the patent and antitrust systems) and a specific, individualized level (in determining the validity of particular agreements). A middle ground, however, might offer benefits. An approach based on the relevant industry would recognize that the systems are not monolithic and would offer more hands-on, informed analyses. At the same time, it would solve many of the administrability problems by not descending to the level of particular practices.

Third, all three tests are designed to apply to licensing practices. Each orders relevant factors in analyzing the propriety of particular agreements.¹⁷¹ But such a paradigm only applies to a license—a completed agreement between patentee and licensee. Given that patentees may choose not to license at all, the question remains as to how courts should analyze a patentee's *refusal* to license.

In short, there is room for a new approach to the patent-antitrust intersection. Part II lays the foundation for this project.

II. THE COMMON DENOMINATOR

In analyzing monopolists' patent-based actions under Section 2 of the Sherman Act, today's courts either defer excessively to the patent system or ignore the unique nature of patent-based practices. They make little attempt to analyze the welfare-enhancing roles that patents and competition actually play in particular industries. Nor have they even attempted to apply the Baxter, Bowman, or Kaplow tests. What the patent-antitrust intersection calls for is a common denominator—a means by which courts can “weigh” antitrust against patent on a new

¹⁷¹ For example, Kaplow applies his “ratio” test to price-restricted licenses, patent combinations, price discrimination, and end-product royalty schemes, *id.* at 1855-87, and Bowman's “principal subject” consists of “the agreements that owners of patents make with others who wish to use them,” BOWMAN, *supra* note 1, at ix.

scale with equivalent measures on both sides.¹⁷²

Not a common denominator at such a high level as to be meaningless. Some, for example, have contended that, because the patent and antitrust laws both promote welfare, there is no conflict.¹⁷³ But that is not helpful; if we abstract away enough levels of generality, much the same could be said about nearly every area of law. And not a “social welfare” common denominator with unmeasurable inputs based on particular practices like the Kaplow ratio test. By “common denominator,” this Article refers to a construct that courts can use to compare the likely effects of, and need for, patents and competition in particular industries. The common denominator that this Article proposes is innovation.

Innovation is the goal of the patent system and one of several important (and becoming ever more so) goals of the antitrust laws. This Section defines innovation; locates it in the text, legislative history, and jurisprudence of the patent and antitrust laws;¹⁷⁴ and reveals some

¹⁷² Technically, when a court analyzes monopolists’ actions, it is not weighing patent against antitrust, but rather is deciding whether or not its application of antitrust law in a particular case will penalize certain patent-based practices by monopolists. Nonetheless, elucidation of such a balancing crystallizes the formidable choices that confront courts in applying two disparate systems designed to promote welfare.

¹⁷³ See, e.g., BOWMAN, *supra* note 1, at 1 (stating that the common objective of both laws is “to maximize wealth by producing what consumers want at the lowest cost”); GEORGE A. HAY, “STRATEGIC BEHAVIOR” CASES 1, 3 (2000) (arguing that the tension between patent and antitrust laws is “vastly exaggerated”); Kevin J. Arquit, Walker Process, Handgards and Professional Real Estate Investors, and Lost Profit Damages, in INTELLECTUAL PROPERTY ANTITRUST: 1995, at 625, 629 (P.L.I. Patents, Copyrights, Trademarks, & Literary Prop. Course, Handbook Series No. 414, 1995) (asserting that patent and antitrust laws are complementary); Howard T. Markey, *Special Problems in Patent Cases*, 57 J. PAT. OFF. SOC’Y 675, 682 (1975) (asserting that conflict is “currently a popular widespread myth”); Kenneth Starling, *The Reagan Legacy in Antitrust: The Perspective of the Antitrust Division*, 35 FED. B. NEWS & J. 242, 243 (1988) (relaying the Reagan Administration’s view that there is no conflict between the laws); see also *Atari Games Corp. v. Nintendo of Am., Inc.*, 897 F.2d 1572, 1576 (Fed. Cir. 1990) (“[T]he aims and objectives of patent and antitrust laws may seem, at first glance, wholly at odds. However, the two bodies of law are actually complementary, as both are aimed at encouraging innovation, industry and competition.”).

¹⁷⁴ Statutory interpretation begins with the text of the statute. See, e.g., *Bankamerica Corp. v. United States*, 462 U.S. 122, 128 (1983) (“The starting point [of statutory interpretation], as always, is the language of the statute.”); *Bread Political Action Comm. v. FEC*, 455 U.S. 577, 580 (1982) (explaining that statutory construction always begins with the statute’s text). Particularly for open-ended statutes for which the text is indeterminate, like the Sherman Act, most (though not all) would agree that the legislative history may provide additional insight. See, e.g., *Wis. Pub. Intervenor v. Mortier*, 501 U.S. 597, 611 n.4 (1991) (“As for the propriety of using legislative history at all, common sense suggests that inquiry benefits from reviewing additional information rather than ignoring it.”); William N. Eskridge, Jr., *The Circumstances of Politics and*

of the axes on which it varies in different industries.

A. Definition

Innovation consists of “the search for and the discovery, development, improvement, adoption and commercialization of new processes, products, and organizational structures and procedures.”¹⁷⁵ Innovation thus differs from invention by including not just the initial discovery or the creation of a potential new product or process, but also the subsequent development and commercialization of the product or process.¹⁷⁶ Recent examples of innovation include the development of novel ways to expand the capabilities and efficiencies of computers and the Internet, the development of new means of communication such as mobile telephones, and the creation of new products and processes in the biopharmaceutical industry (such as genomics and bioinformatics).

The patent system and competition are two primary catalysts for innovation.¹⁷⁷ Not surprisingly, innovation is a critical objective of

the Application of Statutes, 100 COLUM. L. REV. 558, 562 (2000) (“[T]o say that legislative intent or history is not itself law does not require us to deny that it may be evidence of what law means.”).

One of the few issues on which the legislative history of the Sherman Act is clear is the primary role that Congress anticipated for courts in the development of antitrust jurisprudence. *Infra* notes 211-13 and accompanying text. Because of the responsibilities envisioned for courts—along with the crucial role that courts have in fact played—the caselaw is significant in analyzing innovation. Finally, because antitrust courts for at least the past generation have accorded economic analysis the predominant role in antitrust analysis, studies by economists on the importance of various types of economic efficiencies are instructive.

¹⁷⁵ Thomas M. Jorde & David J. Teece, *Innovation, Cooperation, and Antitrust*, in ANTITRUST, INNOVATION, AND COMPETITIVENESS, *supra* note 22, at 47, 48 (citation omitted); see also C.T. TAYLOR & Z.A. SILBERSTON, THE ECONOMIC IMPACT OF THE PATENT SYSTEM: A STUDY OF THE BRITISH EXPERIENCE 27 (1973) (“[Innovation refers to the] process of converting inventions into full-scale productive operations.”). This Article considers innovation as a normatively positive force. It does not consider potential adverse consequences (such as layoffs) that are a potential by-product of innovation and that are not the concern of the antitrust laws.

¹⁷⁶ See TAYLOR & SILBERSTON, *supra* note 175, at 27 (“An invention . . . does not include the engineering work needed to convert an invention into an economically viable operation.”).

¹⁷⁷ Innovation typically requires the presence of other factors, such as: availability of a labor force with the requisite technical skills; decentralized economic structures that permit considerable autonomy and entrepreneurship; economic systems that permit and encourage a variety of approaches to technological and market opportunities; access to “venture” capital . . . ; [and] good relationships between the scientific community . . . and the technological community, and between users and developers of technology . . .

both the patent and antitrust laws.¹⁷⁸

B. *Innovation and the Patent and Antitrust Laws*

1. Patent Laws

a. *Statutes*

Ever since the Framers of the Constitution authorized Congress to “promote the Progress of Science and useful Arts,”¹⁷⁹ invention and innovation have been the primary goals of the patent laws.¹⁸⁰ The first patent statute enacted by Congress, the Patent Act of 1790, offered “the sole and exclusive right and liberty of making, constructing, using and vending” an invention to anyone who “invented or discovered any useful art, manufacture, engine, machine, or device, or any improvement therein not before known or used” that the patent board considered “sufficiently useful and important.”¹⁸¹ The inventor also was required to provide “a specification in writing . . . [that shall] distinguish the invention or discovery from other things before known and used, [and] also to enable . . . [someone] skilled in the art or

Thomas M. Jorde & David J. Teece, *Introduction* to ANTITRUST, INNOVATION, AND COMPETITIVENESS, *supra* note 22, at 3, 6 (citation omitted).

¹⁷⁸ Despite the different routes taken by the patent and antitrust laws to achieve innovation, the end result is the same: new and improved products and processes. These types of advances are consistent with both the statutory requirements of the patent system and market-based incentives such as lead time and learning curve advantages.

¹⁷⁹ U.S. CONST. art. I, § 8, cl. 8.

¹⁸⁰ See Baxter, *supra* note 1, at 312 (describing the purpose of patent law as “the subsidization of innovative activity”); Richard Gilbert & Carl Shapiro, *Optimal Patent Length and Breadth*, 21 RAND J. ECON. 106, 106 (1990) (“The primary purpose of the patent system is to reward innovators.”); E. Thomas Sullivan, *The Confluence of Antitrust and Intellectual Property at the New Century*, 1 MINN. INTEL. PROP. REV. 101, 103 (2000) (“Patent . . . laws give inventors and artists the exclusive right to sell, use, and license their works in order to encourage innovation.”). Even if the system is viewed more as rewarding the initial invention than the subsequent commercialization of the product, see Robert P. Merges, *Commercial Success and Patent Standards: Economic Perspectives on Innovation*, 76 CAL. L. REV. 805, 806-11 (1988) (distinguishing between invention and innovation), this distinction is not significant for our purposes, since inventors typically will consider innovation to be the closely related (and desired) successor to invention. See, e.g., RICHARD R. NELSON & SIDNEY G. WINTER, AN EVOLUTIONARY THEORY OF ECONOMIC CHANGE 263 (1982) (noting that firms consider both business and technical risks in pursuing research and development, and explaining that “in the current institutional environment . . . the old . . . distinction [between invention and innovation] is much less useful than it used to be”).

¹⁸¹ Patent Act of 1790, ch. 7, § 1, 1 Stat. 109, 109.

manufacture . . . to make, construct, or use the [invention]”¹⁸²
 The Patent Act of 1793 offered defenses against claims of patent infringement in circumstances in which the patentee did not contribute to innovation—for example, where the invention “was not originally discovered by the patentee, but had been in use, or had been described in some public work anterior to the supposed discovery of the patentee”¹⁸³

The patent system’s current requirements of novelty, usefulness, nonobviousness, and disclosure play critical roles in fostering innovation.¹⁸⁴ The strict requirement of novelty ensures that the invention is not “known or used by others.”¹⁸⁵ The prerequisite of utility guarantees that the product is useful.¹⁸⁶ Nonobviousness ensures that the invention actually contributes to technological progress, as the subject matter of the patent must not be “obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains.”¹⁸⁷ Finally, the inventor’s description of the invention must enable others who are skilled in the relevant art to make and use it, thereby dispersing the benefits of the invention to the public.¹⁸⁸ Each of these requirements ensures that the patent system culti-

¹⁸² *Id.* § 2, 1 Stat. at 110.

¹⁸³ Patent Act of 1793, ch. 11, § 6, 1 Stat. 318, 322.

¹⁸⁴ The legislature also cultivated innovation by protecting the system against encroachment by the courts. For example, the 1952 Patent Act was enacted in response to court decisions of the prior two decades that had evidenced anti-patent bias. The Supreme Court had expanded the patent misuse doctrine, *Mercoid Corp. v. Mid-Continent Inv. Co.*, 320 U.S. 661, 664-66 (1944); required a showing of “synergism” (that the whole was greater than the sum of the parts) for patents combining existing elements, *Great Atl. & Pac. Tea Co. v. Supermarket Equip. Corp.*, 340 U.S. 147, 152-53 (1950); raised the threshold of the invention requirement by invoking the “flash of . . . genius” test, *Cuno Eng’g Corp. v. Automatic Devices Corp.*, 314 U.S. 84, 91 (1941); and eliminated the practice of drafting claims in “means plus function” terms, *Halliburton Oil Well Cementing Co. v. Walker*, 329 U.S. 1, 7-8 (1946). *See generally* CHISUM ET AL., *supra* note 10, at 21-22. The 1952 Act reauthorized “means plus function” claims, overturned the broad reading of the patent misuse doctrine, introduced an objective standard of nonobviousness in interpreting the invention requirement, and rejected the synergism requirement. 35 U.S.C. §§ 103, 112, 271(d) (1994).

¹⁸⁵ 35 U.S.C. § 102(a) (1994).

¹⁸⁶ *See* 35 U.S.C. § 101 (1994) (“Whoever invents or discovers any new and useful process, machine, manufacture, or composition of matter, or any new and useful improvement thereof, may obtain a patent therefor . . .”).

¹⁸⁷ 35 U.S.C. § 103(a) (Supp. 1998).

¹⁸⁸ The Act states:

The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same, and shall

vates innovation—that future inventors learn how the patented product is made, and that new, useful, and nonobvious products are invented, developed, and brought to market.¹⁸⁹

b. *Legislative history*

The clarity of the patent statute on the issues of invention and innovation minimizes the need to resort to the legislative history. Nonetheless, the legislative history confirms the goals apparent in the text. As a nineteenth-century Senate committee declared: “The promotion of the arts and the improvements of manufactures are the objects aimed at in granting patents for inventions. . . . All civilized nations have provided in some form for the encouragement of inventive genius.”¹⁹⁰ In particular, the patent laws were designed to “derive a just and appropriate encouragement proportioned to the value of [creators’] respective inventions.”¹⁹¹ Other institutions in the system also would contribute to the goal of innovation: courts would apply an “enlightened and liberal application of equitable principles . . . in a just endeavor to sustain patents for meritorious inventions,”¹⁹² and the Commissioner of the Patent Office would have the power to reject applications that were not novel, so as to protect “meritorious inventors.”¹⁹³

The goal of innovation is still critical today. In the early 1980s, many voiced concerns about U.S. global competitiveness, in particular lamenting a decline in research and development.¹⁹⁴ Because the legislature believed that “the primary means of improving productivity

set forth the best mode contemplated by the inventor of carrying out his invention.

35 U.S.C. § 112 (1994).

¹⁸⁹ The language of the patent statute also is broad enough to allow courts to develop a common law that sometimes considers characteristics of particular industries relevant to innovation. For example, due to the risk and expense of innovation in the field of biotechnology, the Federal Circuit has adopted a less stringent standard of nonobviousness. Robert P. Merges, *One Hundred Years of Solicitude: Intellectual Property Law, 1900-2000*, 88 CAL. L. REV. 2187, 2226 (2000).

¹⁹⁰ S. REP. NO. 24-239, at 1 (1836).

¹⁹¹ *Id.* at 2.

¹⁹² *Id.*

¹⁹³ *Id.* at 8.

¹⁹⁴ See Pauline Newman, *The Federal Circuit—A Reminiscence*, 14 GEO. MASON L. REV. 513, 514 (1992) (discussing the Carter Administration’s creation of the Domestic Policy Review of Industrial Innovation to review the patent system during a time of “technological obsolescence”).

lies in the creation of new technologies,¹⁹⁵ and because the role of the patent system in promoting innovation was recognized to be critical,¹⁹⁶ Congress amended the patent laws. It recommended the creation of a single appellate court, the United States Court of Appeals for the Federal Circuit, to hear appeals of patent claims from district courts, thus “improv[ing] investors’ confidence in patented technology,”¹⁹⁷ and it provided for a system of administrative reexamination within the patent office, which was designed to “promote industrial innovation by assuring . . . certainty about patent validity.”¹⁹⁸ In the Patent Law Amendments Act of 1984, Congress created the National Commission on Innovation and Productivity, which was intended to “foster innovation and productivity,”¹⁹⁹ and in the Process Patents Amendment Act of 1988, the Senate intended to confirm that “America’s leading position in technology innovation throughout the world is credited in large part to the stimulus of its patent system.”²⁰⁰ For the past two centuries, the legislative history has confirmed the centrality of innovation to the patent system mandated by the text of the statute.²⁰¹

¹⁹⁵ H.R. REP. NO. 96-1307, pt. I, at 2 (1980), *reprinted in* 1980 U.S.C.C.A.N. 6460, 6461.

¹⁹⁶ *Id.*; *see also* H.R. REP. NO. 97-312, at 23 (1981) (“Patents have served as a stimulus to the innovative process.”).

¹⁹⁷ H.R. REP. NO. 96-1307, pt. I, at 3, *reprinted in* 1980 U.S.C.C.A.N. at 6462. The Federal Circuit was established in the Federal Courts Improvement Act of 1982, Pub. L. No. 97-164, 96 Stat. 25. *See also* H.R. REP. NO. 97-312, at 23 (finding that the creation of the new court “will promote investment in innovative products and new technology”).

¹⁹⁸ H.R. REP. NO. 96-1307, pt. I, at 4, *reprinted in* 1980 U.S.C.C.A.N. at 6463.

¹⁹⁹ Patent Law Amendments Act of 1984, Pub. L. No. 98-622, § 303, 98 Stat. 3383, 3389.

²⁰⁰ S. REP. NO. 100-83, at 24 (1987).

²⁰¹ Court decisions provide yet additional support for the primacy of innovation. The Supreme Court has explained that the patent laws “seek[] to foster and reward invention” and that the disclosure of inventions “stimulate[s] further innovation and . . . permit[s] the public to practice the invention once the patent expires.” *Aronson v. Quick Point Pencil Co.*, 440 U.S. 257, 262 (1979); *see also, e.g., Bonito Boats, Inc. v. Thunder Craft Boats, Inc.*, 489 U.S. 141, 146 (1989) (“The Patent Clause itself reflects a balance between the need to encourage innovation and the avoidance of monopolies which stifle competition without any concomitant advance in the ‘Progress of Science and useful Arts.’”); *Kewanee Oil Co. v. Bicron Corp.*, 416 U.S. 470, 480-81 (1974) (stating that the productive effort fostered by the right of exclusion “will have a positive effect on society through the introduction of new products and processes of manufacture into the economy”); *G.S. Rasmussen & Assocs. v. Kalitta Flying Serv., Inc.*, 958 F.2d 896, 905-06 (9th Cir. 1992) (finding that the Federal Aviation Act certification scheme was consistent with the goals of patent law in fostering and rewarding invention, while stimulating further innovation and the circulation of information in the public domain); *Shapiro v. Gen. Motors Corp.*, 472 F. Supp. 636, 641 n.2 (D. Md. 1979) (“Arti-

2. Antitrust Laws

In contrast to the patent laws, there has not been one universally accepted objective animating the antitrust laws. Fostering innovation, nonetheless, is one important goal, which is becoming ever more critical in the “new economy” of the twenty-first century.

a. *Statutes/legislative history*

The text of the Sherman Act fails to provide guidance on the role of innovation—or, in fact, any other efficiency or noneconomic factor—as a goal of the antitrust laws.²⁰² Section 1 outlaws “[e]very contract, combination in the form of trust or otherwise, or conspiracy, in restraint of trade.”²⁰³ Section 2 prohibits parties from “mono-

cle I, § 8, cl. 8 of the Constitution provides Congress with the authority to grant inventors exclusive rights to their discoveries for limited periods to promote new ideas and innovation.”); *Glen Mfg., Inc. v. Perfect Fit Indus., Inc.*, 299 F. Supp. 278, 282 (S.D.N.Y. 1969) (“To promote scientific innovations and invention, the patent laws grant a monopoly to the patentee for a limited time, subject to the strict laws of the patent.”). The Supreme Court also has described the “patent monopoly [as] . . . a reward, an inducement, to bring forth new knowledge.” *Graham v. John Deere Co.*, 383 U.S. 1, 9 (1966). Finally, other courts have linked the goal of innovation to general benefits for society, stating that “[t]he reason for the patent system is to encourage innovation and its fruits: new jobs and new industries, new consumer goods and trade benefits.” *Paulik v. Rizkalla*, 760 F.2d 1270, 1276 (Fed. Cir. 1985); *see also Kendall v. Winsor*, 62 U.S. (21 How.) 322, 327-28 (1858) (“It is undeniably true, that the limited and temporary monopoly granted to inventors was never designed for their exclusive profit or advantage; the benefit to the public or community at large was another and doubtless the primary object in granting and securing the monopoly.”); *Pennock v. Dialogue*, 27 U.S. (2 Pet.) 1, 19 (1829) (finding that the objective of patent law could best be accomplished “by giving the public at large a right to make, construct, use and vend the thing invented, at as early a period as possible”).

²⁰² The constitutional grant of authority for the antitrust laws is the Commerce Clause. U.S. CONST. art. I, § 8, cl. 3; *see also City of Lafayette v. La. Power & Light Co.*, 435 U.S. 389, 398 (1978) (“On its face[, the Sherman Act] shows a carefully studied attempt to bring within the Act every person engaged in business whose activities might restrain or monopolize commercial intercourse among the states.”); *Atl. Cleaners & Dyers, Inc. v. United States*, 286 U.S. 427, 435 (1932) (stating that, in passing Section 1 of the Sherman Act, Congress “could exercise only the power conferred by the commerce clause”).

²⁰³ In full, Section 1 provides:

Every contract, combination in the form of trust or otherwise, or conspiracy, in restraint of trade or commerce among the several States, or with foreign nations, is declared to be illegal. Every person who shall make any contract or engage in any combination or conspiracy hereby declared to be illegal shall be deemed guilty of a felony, and, on conviction thereof, shall be punished by fine not exceeding \$10,000,000 if a corporation, or, if any other person, \$350,000, or by imprisonment not exceeding three years, or by both said punishments, in the discretion of the court.

poliz[ing], . . . attempt[ing] to monopolize, or combin[ing] or conspir[ing] . . . to monopolize” any part of interstate or foreign commerce.²⁰⁴ Such vague language does not shed light on the objectives thereby to be served. It therefore is worth considering the legislative history of the Sherman Act as a potential avenue of insight into the goals of the legislation.

Most of the debate on the adoption of the Sherman Act came in the context of Section 1.²⁰⁵ The members of the Senate Judiciary Committee briefly discussed Section 2, indicating that the term “monopoly” was a “technical term known to the common law” that was not intended to apply to someone “who merely by superior skill and intelligence” amassed a significant share of the market, but rather was meant to encompass “the sole engrossing to a man’s self by means which prevent other men from engaging in fair competition with him.”²⁰⁶ In short, the legislative history of Section 2 “provides almost no enlightenment about what it means ‘to monopolize’ a part of commerce.”²⁰⁷

An overall review of the legislative history of the Sherman Act reveals support for several potential goals: consumer welfare, the protection of small businesses, the process of competition, and economic fairness.²⁰⁸ Although the history fails to reveal one overriding goal, the promotion of innovation is consistent with several of the articulated

15 U.S.C. § 1 (1994).

²⁰⁴ Section 2 states:

Every person who shall monopolize, or attempt to monopolize, or combine or conspire with any other person or persons, to monopolize any part of the trade or commerce among the several States, or with foreign nations, shall be deemed guilty of a felony, and, on conviction thereof, shall be punished by fine not exceeding \$10,000,000 if a corporation, or, if any other person, \$350,000, or by imprisonment not exceeding three years, or by both said punishments, in the discretion of the court.

15 U.S.C. § 2 (1994).

²⁰⁵ Senator Sherman’s bill “ha[d] for its single object to invoke the aid of the courts of the United States to deal with the combinations.” 21 CONG. REC. 2456 (1890) (statement of Sen. Sherman).

²⁰⁶ *Id.* at 3152 (statement of Sen. Hoar); *see also* Hovenkamp, *supra* note 135, at 1036 (“The only thing that seems clear is that the monopolizing offense refers to someone who acquires or attempts to acquire all of the business in the market, and that this acquisition could not be the result of superior skill or industry.”).

²⁰⁷ Hovenkamp, *supra* note 135, at 1035.

²⁰⁸ *See, e.g.*, Robert H. Bork, *The Role of the Courts in Applying Economics*, 54 ANTITRUST L.J. 21, 24 (1985) (“[T]he legislative history [reveals] repeated concern for the welfare of consumers and . . . small business and for . . . a potpourri of other values. . . . So far as I’m aware, Congress, in enacting these statutes, never faced the problem of what to do when values come into conflict in specific cases.”).

objectives. For example, Congress's concern about trusts reducing output, hampering the "skill" created by competition,²⁰⁹ and "prevent[ing] competition in the manufacture, making, purchase, sale, or transportation of merchandise, produce, or commodities"²¹⁰ overlaps with apprehensions of diminished innovation.

One issue on which the legislative history is crystal clear is Congress's intention that the courts would play the primary role in the development of antitrust jurisprudence. Courts were to turn to the "old and well recognized principles of the common law"²¹¹ in fleshing out gaps in the Sherman Act. The legislature, for example, refused to distinguish between reasonable and unreasonable restraints of trade, assuming that courts would play this role. As Senator Sherman explained:

I admit that it is difficult to define in legal language the precise line between lawful and unlawful combinations. This must be left for the courts to determine in each particular case. All that we, as lawmakers, can do is to declare general principles, and we can be assured that the courts will apply them so as to carry out the meaning of the law,²¹² as the courts of England and the United States have done for centuries.

The indeterminacy of the text and legislative history, together with Congress's delegation to the courts of the authority to develop antitrust jurisprudence²¹³ and courts' full-fledged utilization of that

²⁰⁹ 21 CONG. REC. 4102 (1890) (statement of Rep. Fithian).

²¹⁰ S. 1, 51st Cong. § 4 (1890); *see also* S. 3445, 50th Cong. § 1 (1888); 21 CONG. REC. 1772 (1890); *id.* at 2469 (statement of Sen. Reagan); *id.* at 2597.

²¹¹ 21 CONG. REC. 2456 (1890) (statement of Sen. Sherman); *see also id.* at 2457 (statement of Sen. Sherman) ("It is the unlawful combination, tested by the rules of common law and human experience, that is aimed at by this bill, and not the lawful and useful combination."); *id.* at 3152 (statement of Sen. Hoar) ("The great thing that this bill does . . . is to extend the common-law principles, which protected fair competition in trade in old times in England, to international and interstate commerce in the United States."); *id.* at 3149 (statement of Sen. Morgan) (noting the use in the debate of "common-law terms" and "common-law definitions").

²¹² *Id.* at 2460 (statement of Sen. Sherman); *see also id.* at 2456 (statement of Sen. Sherman) ("[Courts] will distinguish between lawful combinations in aid of production and unlawful combinations to prevent competition and in restraint of trade . . ."); *id.* at 4089 (statement of Rep. Culberson) ("Now, just what contracts, what combinations in the form of trusts, or what conspiracies will be in restraint of the trade or commerce mentioned in the bill will not be known until the courts have construed and interpreted this provision.").

²¹³ In the words of Justice Stevens:

Statutes like the Sherman Act . . . were written in broad general language on the understanding that the courts would have wide latitude in construing them to achieve the remedial purposes that Congress had identified. The wide open spaces in [the] statutes . . . are most appropriately interpreted as

delegation, requires analysis of the caselaw in determining the propriety of innovation as an objective of the antitrust laws.

b. *Antitrust jurisprudence and economic efficiencies*

The role that courts have played in developing antitrust law throughout the past century has been a versatile one, exhibiting “tremendous flexibility and . . . responsive[ness] to changes in economic thinking and social policy.”²¹⁴ From the Sherman Act to the Clayton Act²¹⁵ to the Federal Trade Commission Act,²¹⁶ the courts have interpreted antitrust statutes loosely and have treated antitrust legislation as “organic,”²¹⁷ allowing economic theory to inform the development of the law.²¹⁸ In discussing the precedential value of antitrust cases, for example, the Supreme Court has declared that *stare decisis*, which “is not an inexorable command,” often will lose out to the “competing interest . . . in recognizing and adapting to changed circumstances and the lessons of accumulated experience.”²¹⁹ While the modes of analysis (and attention given to economic reasoning)²²⁰ have varied throughout the period,²²¹ the goal of maximizing economic effi-

implicit delegations of authority to the courts to fill in the gaps in the common-law tradition of case-by-case adjudication.

McNally v. United States, 483 U.S. 350, 372-73 (1987) (Stevens, J., dissenting); *see also Nat'l Soc'y of Prof'l Eng'rs v. United States*, 435 U.S. 679, 688 (1978) (“The legislative history makes it perfectly clear that [Congress] expected the courts to give shape to the [Sherman Act’s] broad mandate by drawing on common-law tradition.” (footnote omitted)); William F. Baxter, *Separation of Powers, Prosecutorial Discretion, and the “Common Law” Nature of Antitrust Law*, 60 TEX. L. REV. 661, 663 (1982) (“By adopting a common-law approach [to antitrust law], Congress in effect delegated much of its lawmaking power to the judicial branch.”).

²¹⁴ Hammer, *supra* note 2, at 907.

²¹⁵ 15 U.S.C. §§ 12-27 (1994).

²¹⁶ 15 U.S.C. §§ 41-58 (1994).

²¹⁷ Hammer, *supra* note 2, at 913. For a compilation of commentators embracing such an approach, *see id.* at 906 n.151.

²¹⁸ *Id.* at 913.

²¹⁹ *State Oil Co. v. Khan*, 522 U.S. 3, 20 (1997) (quoting *Payne v. Tennessee*, 501 U.S. 808, 828 (1991)).

²²⁰ Economic objectives were one goal before the 1970s, but not to the exclusion of noneconomic factors. *See, for example, United States v. Topco Associates, Inc.*, 405 U.S. 596, 610 (1972); *United States v. Von's Grocery Co.*, 384 U.S. 270, 278 & n.14 (1966); *United States v. Philadelphia National Bank*, 374 U.S. 321, 360 n.37 (1963); *Klor's, Inc. v. Broadway-Hale Stores, Inc.*, 359 U.S. 207, 213 (1959); and *Fashion Originators' Guild v. FTC*, 312 U.S. 457, 465-66 (1941).

²²¹ In the patent-antitrust intersection alone, courts have shifted from automatically finding for the patentholder in the late nineteenth century, to viewing patents with hostility through much of the twentieth century, to taking more moderate ap-

ciency²²² has been nearly unanimously accepted for at least the past two decades. Courts today begin and end their antitrust examination with economic analysis.²²³

Of the economic efficiencies, courts have focused primarily on allocative efficiency—the optimal allocation of goods and services to consumers. Courts therefore have analyzed the effect of challenged practices on price²²⁴ or output²²⁵ in the relevant markets.

But courts also have analyzed innovative efficiencies.²²⁶ In *United*

proaches today. *See supra* note 35 (providing a summary historical review of courts' analysis of the patent-antitrust intersection).

²²² “[E]conomic efficiency refers to a decision or event that increases the total value of all economically measurable assets in the society or total social wealth.” Brodley, *supra* note 2, at 1025. Antitrust courts have considered three types of efficiencies: (1) allocative efficiency, which refers generally to the allocation of goods and services to buyers who value them most, (2) productive efficiency, which denotes the production of goods in the most cost-effective manner, and (3) innovative efficiency, which signifies gains through the invention, development, and diffusion of new products and production processes that increase social wealth. *Id.*; *see also* AREEDA & KAPLOW, *supra* note 2, at 7 (explaining that competition generates productive and allocative efficiencies).

²²³ *See, e.g., Khan*, 522 U.S. at 18 (finding insufficient economic justification for invalidation of vertical maximum price fixing); *Brooke Group, Ltd. v. Brown & Williamson Tobacco Corp.*, 509 U.S. 209, 231 (1993) (examining economic indicia to find that plaintiff had failed to prove that defendant had “a reasonable prospect of recovering its losses from below-cost pricing”); *Bus. Elecs. Corp. v. Sharp Elecs. Corp.*, 485 U.S. 717, 731 (1988) (holding that economic analysis supports the view that vertical restraints are not per se illegal under the Sherman Act unless they include some agreement on price or price level).

²²⁴ Courts have found that restraints raised prices, *e.g., NCAA v. Bd. of Regents*, 468 U.S. 85, 113 (1984); *Associated Radio Serv. Co. v. Page Airways, Inc.*, 624 F.2d 1342, 1352 (5th Cir. 1980); lowered prices, *e.g., Law v. NCAA*, 134 F.3d 1010, 1020 (10th Cir. 1998); *Seaboard Supply Co. v. Congoleum Corp.*, 770 F.2d 367, 375 (3d Cir. 1985); or had no effect on price, *e.g., Oksanen v. Page Mem'l Hosp.*, 945 F.2d 696, 709 (4th Cir. 1991); *Guyon v. Chinese Shar-Pei Club*, No. 89-15483, 1990 WL 121080, at *2 (9th Cir. Aug. 21, 1990); *Sitkin Smelting & Ref. Co. v. FMC Corp.*, 575 F.2d 440, 447 (3d Cir. 1978).

²²⁵ Courts have analyzed whether the number of suppliers or products in a market has risen, *e.g., Kumar v. Nat'l Med. Enters., Inc.*, No. 93-16841, 1994 WL 659031, at *2 (9th Cir. Nov. 22, 1994); *Lie v. St. Joseph Hosp.*, 964 F.2d 567, 570 (6th Cir. 1992); *Oksanen*, 945 F.2d at 709; remained unchanged, *e.g., Sitkin Smelting*, 575 F.2d at 447; *Minn. Ass'n of Nurse Anesthetists v. Unity Hosp.*, 5 F. Supp. 2d 694, 707 (D. Minn. 1998); *Miller v. Ind. Hosp.*, 814 F. Supp. 1254, 1265 (W.D. Pa. 1992); or decreased, *e.g., FTC v. Ind. Fed'n of Dentists*, 476 U.S. 447, 459 (1986); *Nat'l Soc'y of Prof'l Eng'rs v. United States*, 435 U.S. 679, 692-95 (1978); *NCAA*, 468 U.S. at 113.

²²⁶ *See, e.g., John J. Flynn, Antitrust Policy, Innovation Efficiencies, and the Suppression of Technology*, 66 ANTITRUST L.J. 487, 497 (1998) (“[I]nnovation and production efficiencies have in fact been a central concern of antitrust policy since the beginning, and have been a principal reason for instituting some of antitrust’s most doctrinally significant and successful cases.”).

States v. United Shoe Machinery Corp., for example, the court explained that the antitrust laws permit “the process of invention and innovation . . . [as conduct] which a competitive society must foster.”²²⁷ Courts have upheld under Section 2 monopolists’ alterations of products that affect complementary products,²²⁸ introductions of new products that have the effect of injuring competitors,²²⁹ and instances of failure to “predisclose” their products to competitors.²³⁰ And in the *Microsoft* case, the district court found that the defendant’s activity harmed innovation; it declared a Section 2 violation on the grounds that Microsoft’s acts “trammelled the competitive process through which the computer software industry generally stimulates innovation and conduces to the optimum benefit of consumers.”²³¹ The antitrust enforcement agencies also have come to recognize the importance of innovation.²³²

²²⁷ 110 F. Supp. 295, 344 (D. Mass. 1953), *aff’d*, 347 U.S. 521 (1954) (per curiam).

²²⁸ *See, e.g.*, *Berkey Photo, Inc. v. Eastman Kodak Co.*, 603 F.2d 263, 286 (2d Cir. 1979) (stating that “it would be difficult to fault Kodak for attempting to design a [new] film that could provide better results” than the old film).

²²⁹ *See, e.g.*, *Cal. Computer Prods., Inc. v. IBM Corp.*, 613 F.2d 727, 744 (9th Cir. 1979) (holding that IBM could “redesign its products to make them more attractive to buyers” and “need not have . . . constricted its product development so as to facilitate sales of rival products”); *ILC Peripherals Leasing Corp. v. IBM Corp.*, 458 F. Supp. 423, 440-41 (N.D. Cal. 1978) (upholding modification by IBM of a plug device as a justifiable innovation even though it prevented the operation of interfaces with competitors’ peripheral devices), *aff’d sub nom. Memorex Corp. v. IBM Corp.*, 636 F.2d 1188 (9th Cir. 1980).

²³⁰ *See, e.g.*, *Berkey Photo*, 603 F.2d at 281 (“If a firm that has engaged in the risks and expenses of research and development were required . . . to share with its rivals the benefits of those endeavors, this incentive [to innovate] would very likely be vitiated. Withholding . . . advance knowledge of one’s new products, therefore, ordinarily constitutes valid competitive conduct.”).

²³¹ 87 F. Supp. 2d 30, 44 (D.D.C. 2000) (conclusions of law); *see also* 147 F.3d 935, 948 (D.C. Cir. 1998) (“[A]ny dampening of technological innovation would be at cross-purposes with antitrust law.”); 84 F. Supp. 2d 9, 69 (D.D.C. 1999) (findings of fact) (stating that Microsoft “stifled innovation” by computer manufacturers); *id.* at 111-12 (“The actions that Microsoft took against [Netscape] Navigator hobbled a form of innovation that had shown the potential to depress the applications barrier to entry sufficiently to enable other firms to compete effectively against Microsoft in the market for Intel-compatible PC operating systems.”); *id.* at 112 (finding that Microsoft restricted innovation by making it more difficult for developers to write cross-platform Java applications).

²³² *See, e.g.*, U.S. DEP’T OF JUSTICE & FED. TRADE COMM’N, ANTITRUST GUIDELINES FOR COLLABORATIONS AMONG COMPETITORS § 3.31(a) (2000) [hereinafter GUIDELINES FOR COLLABORATIONS] (noting that most R&D collaboration agreements are procompetitive and that “[t]hrough the combination of complementary assets, technology, or know-how, an R&D collaboration may enable participants more quickly or more efficiently to research and develop new or improved goods, services, or pro-

In determining the relative significance of various types of efficiencies, the findings of economists obviously are essential. The consensus among economists since Schumpeter²³³ is that the gains achieved from innovative efficiencies dwarf those derived from maximizing allocative efficiency and that innovation is the most important factor in the growth of the economy.²³⁴ Economic studies have re-

duction processes”), available at <http://www.ftc.gov/os/1999/9910/jointventureguidelines.htm>; Gallini & Trebilcock, *supra* note 11, at 18 (noting that competition authorities have come to recognize that technological progress “contributes at least as much to social welfare as does the elimination of allocative inefficiencies”); William J. Baer, Director, FTC Bureau of Competition, Address Before the American Bar Association (Apr. 15, 1999), at <http://www.ftc.gov/speeches/other/baerspaba99.htm> (“[T]he focus of competition in [high tech] industries is not over price but innovation of the next generation products.”); Susan DeSanti, The Intersection of Antitrust and Intellectual Property Issues: A Report from the FTC Hearings, Remarks Before the Conference: Antitrust for High-Tech Companies Business Development Associates (Feb. 2, 1996), at <http://www.ftc.gov/speeches/other/desanti1.htm> (summarizing FTC hearings on global-based competition and noting that “[c]ompetition in some markets is evolving so that the competition centers as much or more around innovation than price”).

In fact, the 1995 Intellectual Property Guidelines proclaim that “[t]he intellectual property laws and the antitrust laws share the common purpose of promoting innovation and enhancing consumer welfare.” INTELLECTUAL PROPERTY GUIDELINES, *supra* note 16, § 1.0. The Guidelines elaborate:

The intellectual property laws provide incentives for innovation and its dissemination and commercialization by establishing enforceable property rights for the creators of new and useful products, more efficient processes, and original works of expression The antitrust laws promote innovation and consumer welfare by prohibiting certain actions that may harm competition with respect to either existing or new ways of serving consumers.

Id.

²³³ See SCHUMPETER, *supra* note 14, at 87 (emphasizing significance of innovation, which reduces concern with output-restricting practices).

²³⁴ See, e.g., Phillip Areeda, *Antitrust Law as Industrial Policy: Should Judges and Juries Make It?*, in ANTITRUST, INNOVATION, AND COMPETITIVENESS, *supra* note 22, at 29, 31 (“At least since Schumpeter wrote nearly fifty years ago, innovation has been thought to contribute far more to our well-being than keeping prices closer to costs through competition.”); William F. Baxter, *Antitrust Law and Technological Innovation*, ISSUES SCI. & TECH., Winter 1985, at 80, 82 (“The contribution of technological advances to our economic well-being is very substantial when compared with the damage that could be caused by restrictive behavior the antitrust laws seek to halt.”); Brodley, *supra* note 2, at 1026 (“Innovation efficiency or technological progress is the single most important factor in the growth of real output in the United States and the rest of the industrialized world.”); Frank H. Easterbrook, *Ignorance and Antitrust*, in ANTITRUST, INNOVATION, AND COMPETITIVENESS, *supra* note 22, at 119, 122 (“An antitrust policy that reduced prices by 5 percent today at the expense of reducing by 1 percent the annual rate at which innovation lowers the costs of production would be a calamity.”); F.M. Scherer, *Antitrust, Efficiency, and Progress*, 62 N.Y.U. L. REV. 998, 1018 (1987) (maintaining that productive efficiency is “much more important quantitatively” than allocative efficiency and long-run technological efficiency “is almost surely even more

vealed that at least fifty percent of the increase in U.S. output from the late 1920s to the late 1960s was due solely to technological and scientific progress²³⁵ and that declines in innovation contributed to a reduction in the growth of business-sector productivity by roughly sixty-five percent from the 1947-1973 period to the 1973-1987 period.²³⁶ In contrast, the welfare loss from monopoly is substantially less than one percent of the gross national product.²³⁷

Buttressing these conclusions, evidence from today's high-tech economy shows that innovation is more important than ever. The currency of the economy today is new information and new technologies, not simply lower prices. Fierce competition often is accompanied by major paradigm shifts that "cause incumbents' positions to be completely overturned."²³⁸ And the tools that courts traditionally have applied to analyze allocative efficiency—such as comparing price with

important"); Donald F. Turner, *Basic Principles in Formulating Antitrust and Misuse Constraints on the Exploitation of Intellectual Property Rights*, 53 ANTITRUST L.J. 485, 485 (1985) ("[I]n the long run, technological progress contributes far more to consumer welfare than does the elimination of allocative inefficiencies caused by noncompetitive pricing." (citation omitted)). The emphasis on innovative over allocative efficiency also can be generally viewed as focusing on dynamic rather than static competition.

²³⁵ See EDWARD F. DENISON, ACCOUNTING FOR UNITED STATES ECONOMIC GROWTH, 1929-1969, at 135 (1974) (attributing the increase in U.S. output during this period largely to "advances in knowledge"); see also Thomas M. Jorde & David J. Teece, *Rule of Reason Analysis of Horizontal Arrangements: Agreements Designed to Advance Innovation and Commercialize Technology*, at <http://www.ftc.gov/opp/global/jorde2.htm> (last visited Jan. 15, 2002) (referring to various economic studies that support technological change as the driving force of economic output). If anything, the percentage of economic growth resulting from innovation has increased in the past generation.

²³⁶ ECONOMIC REPORT OF THE PRESIDENT, H.R. DOC. NO. 100-154, at 300 (1988). Moreover, the impact of innovation on consumer welfare likely is understated by productivity statistics due to difficulties in measuring the superiority of new consumer goods. SCHERER & ROSS, *supra* note 6, at 614.

²³⁷ See EDWARD F. DENISON, THE SOURCES OF ECONOMIC GROWTH IN THE UNITED STATES AND THE ALTERNATIVES BEFORE US 194, 199 (1962) (noting that the welfare loss resulting from misallocation of resources as a result of monopoly is approximately one-half of one percent).

²³⁸ David J. Teece & Mary Coleman, *The Meaning of Monopoly: Antitrust Analysis in High-Technology Industries*, 43 ANTITRUST BULL. 801, 804 (1998); see also David S. Evans, *Antitrust and the New Economy*, in ANTITRUST LAW IN THE 21ST CENTURY 41, 52 (A.L.I.-A.B.A. Course of Study Materials, No. SF63, 2000) (explaining that in the initial race, new economy companies "invest heavily to develop a product that creates a new category" and that "[i]n subsequent races, firms invest heavily to displace the leader by leapfrogging the leader's technology"); Richard A. Posner, *Antitrust in the New Economy*, in ANTITRUST LAW IN THE 21ST CENTURY, *supra*, at 115, 121 (noting that network monopolists "do not seem particularly secure against competition" because of very high rates of innovation, large amounts of investment capital, and the rapidity with which electronic networks can be activated).

the marginal cost of producing the item—will often not be helpful today. New-economy firms usually have high fixed costs, because of significant R&D investments or the need to invest in networks, but low marginal costs, because the cost of producing an additional unit is insignificant.²³⁹ Today's firms innovate on the belief that the (at least temporary) market power they foresee will allow them to charge prices exceeding marginal costs enough to compensate them for their high fixed costs.²⁴⁰

In short, the text and legislative history of the Sherman Act are indeterminate as to the goals of the Sherman Act, but the legislative history reveals that Congress intended that the courts would play the primary role in developing antitrust jurisprudence. For at least the past generation, courts have emphasized economic efficiencies to the exclusion of noneconomic objectives. And because innovation contributes more to economic growth than any other type of efficiency, positing it as the goal of the antitrust laws is appropriate.

C. *Different Paths in Different Industries*

Even if the antitrust and patent laws both endeavor to increase “innovation,” this is no one-size-fits-all concept. Innovation occurs in different ways in different industries, with the contours dependent on factors such as: (1) the presence of market-based incentives; (2) the necessity of patents; and (3) the cumulative nature of innovation in the industry.

Sketched along a timeline, innovation can be broken down into *ex ante* and *ex post* perspectives. The *ex ante* perspective focuses on the viewpoint of the prospective inventor before the product is developed. It asks which incentives motivated the inventor to create the product: A twenty-year right to exclude? Rewards from the market? The first two factors in the preceding paragraph can be placed into the *ex ante* category. The first factor, by emphasizing nonpatent incentives to innovate arising from the particular market at issue, highlights the benefits of competition in the industry. The second—the

²³⁹ DAVID S. EVANS & RICHARD SCHMALENSSEE, SOME ECONOMIC ASPECTS OF ANTITRUST ANALYSIS IN DYNAMICALLY COMPETITIVE INDUSTRIES 7-8 (Nat'l Bureau of Econ. Research, Working Paper No. 8268, 2001); Evans, *supra* note 238, at 49. Similarly, much of the intellectual property at the heart of the new economy has significant fixed costs but de minimis marginal costs, as the cost of creating the product is high but the cost of making an additional copy of the product is trivial. Posner, *supra* note 238, at 118.

²⁴⁰ Evans, *supra* note 238, at 55.

necessity of patents in an industry—can further be dissected into (a) the expense and uncertainty of creating the product and (b) the ease with which the product can be imitated after development. The more these latter factors exist in the relevant industry, the greater the need for patents.²⁴¹

The ex post perspective targets the path of innovation after the creation of the product. In other words, does innovation take place in a cumulative fashion, with new products building on previous inventions? Or is it discrete, made up of well-defined inventions not forming the building blocks for subsequent advances? The more that innovation in the industry is cumulative, the greater should be the role of competition.²⁴²

Taking the ex ante and ex post perspectives into account provides a comprehensive view not only of the temporal stages of the process of innovation, but also of several independent and critical factors that inform innovation.²⁴³ In addition, the perspectives allow for an individualized look at the industry at issue. These perspectives will form the centerpiece of the test proposed in the next Part.

III. THE TEST

This Article proposes an innovation-centered rebuttable presumption that courts can apply in analyzing monopolists' patent-based actions. The presumption ensures that the action makes economic sense other than by injuring competitors. The rebuttal—the centerpiece of the analysis—determines whether competition, rather than patents, is responsible for innovation in the industry. Finally, the sur-rebuttal sheds light on the actual level of innovation in the market.

A. *The Presumption*

The first stage of analysis is the presumption. A company's patent-

²⁴¹ For a more detailed explication of the ex ante factors, see *infra* notes 252-55 and accompanying text.

²⁴² For a more detailed explication of the ex post factors, see *infra* note 297 and accompanying text.

²⁴³ The primary methodologies underlying the factors are objective and rely on analyses of the relevant market or industry. Obviously, the cumulateness of innovation is based on an examination of the types and path of innovation in an industry. But even the ex ante factors, though phrased in terms of "incentives," rely on determinations observable and specific to the industry—such as the presence of market-based incentives like network effects and the cost of creating and ease of imitating inventions—rather than, for example, the subjective intent of the patentee.

based actions²⁴⁴ are lawful as long as there is a plausible justification for the action other than injuring competitors. A plausible justification refers to a differentially considered business rationale for the conduct that explains the actions under actual (not hypothetical) conditions and that does not second-guess what appear to be legitimate business rationales.²⁴⁵ Courts are to determine the justification not by probing the monopolist's subjective intentions but by analyzing the objective consequences of the action.²⁴⁶ Such a strong presumption makes sense not only because a company's actions based on its valid patents are not the typical "bad acts" punished under Section 2, but also, relatedly, because they are the intended reward of the patent system. Such a presumption offers clarity and predictability for courts and parties.

The requirement of a plausible justification for the conduct other

²⁴⁴ By focusing on "patent-based" actions, the test excludes patents obtained by fraud or enforced in bad faith. Such actions, which are invalid under *Walker Process Equipment, Inc. v. Food Machinery & Chemical Corp.*, 382 U.S. 172 (1965), and *Handgards, Inc. v. Ethicon, Inc.*, 601 F.2d 986 (9th Cir. 1979), do not promote the purposes underlying the patent system and are not entitled to a presumption of validity.

²⁴⁵ Courts often describe this as an "efficiency" justification for the conduct. See *Aspen Skiing Co. v. Aspen Highlands Skiing Corp.*, 472 U.S. 585, 610 (1985) (concluding that evidence supports an "inference that Ski Co. was not motivated by efficiency concerns"); 3 AREEDA & HOVENKAMP, *supra* note 137, ¶ 658f, at 124 (noting that courts utilize a "business justification" defense that references productive efficiency in its focus on the costs or output of the monopolist); Ronald A. Cass & Keith N. Hylton, *Anti-trust Intent*, 74 S. CAL. L. REV. 657, 677 (2001) (noting that credible efficiency justifications suffice to defeat a finding of specific intent to undermine competition).

The test bears resemblance to that used by the Supreme Court in *Aspen Skiing Co.*, 472 U.S. at 585. In that case, the Court found that a downhill skiing facility with monopoly power "fail[ed] to offer any efficiency justification" for withdrawing from a joint ticketing arrangement with a competitor. *Id.* at 608. The Court found that the monopolist was willing to forego ticket sales and consumer goodwill "because it was more interested in reducing competition in the . . . market over the long run by harming its smaller competitor." *Id.* The presumption offered by this Article differs from this analysis in making explicit that an action that makes sense only by harming competitors does not constitute a valid justification for the conduct.

²⁴⁶ Cf. Cass & Hylton, *supra* note 245, at 659, 676 (utilizing the term "specific intent" to refer to inquiry "conducted on the basis of objective evidence" and noting that courts infer specific intent when evidence indicates "the absence of credible efficiency justifications for the monopolists' conduct"). For example, licensing terms such as territorial and field-of-use restrictions, and royalty payments for which price exceeds marginal cost, typically make legitimate business sense since the activities allow the company to recoup the expenditures it incurred in developing the product. In contrast, licensing a patented product only on the condition that the licensee not deal with competitors of the monopolist, *e.g.*, *Lorain Journal Co. v. United States*, 342 U.S. 143, 155 (1951), would not receive the benefit of the presumption since the only conceivable effect of the restriction is to injure competitors.

than injuring competitors confirms that the act is not merely predatory and that there is some positive effect on welfare connected with the act. This aspect of the presumption is not meant to erect a significant hurdle in front of the defendant. It does not require the benefits to society from the challenged action to outweigh the costs. Nor does it seek to balance precise levels of procompetitive and anticompetitive effects of the conduct. Nor again does it require the action to be the least restrictive alternative that will achieve the benefit at issue. The looseness of the test ensures that the presumption will in fact be a presumption, rather than an unwitting stumbling block in the path of the defendant. But if the action makes sense only by harming competitors, the presumption will not apply and the conduct will (assuming the other requirements for a Section 2 violation are proved) violate Section 2.

Moreover, the presumption allows courts to consider the nature of the monopolist's activity. While the rebuttal and surrebuttal stages focus on innovation in particular markets or industries, the presumption concentrates judicial analysis on the defendant itself. It ensures that the defendant's action is based on the patent (and thus promotes the incentives underlying the patent system) and that, by virtue of having some business justification, it has a positive effect on welfare. The presumption thus is critical in analyzing the activity of the defendant.

B. *The Rebuttal*

Once the presumption is met, the burden of production will shift to the plaintiff to prove that the rebuttal applies.²⁴⁷ The rebuttal will be based on the common denominator of innovation—more specifically, on the roles played by patents and competition in attaining innovation in particular industries. In industries in which innovation is achieved not from patents, but from competition, the presumption of lawfulness will be rebutted.²⁴⁸ While patents may be responsible for innovation in certain industries, patentee monopolists should not receive carte blanche from the antitrust laws in industries in which competition is the catalyst for innovation. For even if the patent-based act does not appear to be predatory, patents cannot be the ultimate trump card. The rebuttal recognizes those industries in which compe-

²⁴⁷ The burden of proof, of course, remains with the plaintiff at each stage to demonstrate a violation of Section 2 of the Sherman Act.

²⁴⁸ This inquiry is further developed *infra* Parts III.B.1-2.

tion plays the critical role in fostering innovation.²⁴⁹

The building blocks for the rebuttal are the *ex ante* and *ex post* perspectives introduced above.²⁵⁰ The plaintiff must prove that *both* perspectives demonstrate that competition (and not patents) is responsible for innovation in the industry.²⁵¹

1. Ex Ante Incentives

The question of *ex ante* incentives embraces three subissues: (1) the presence of market-based incentives to innovate, (2) the ease of creating the product, and (3) the difficulty of imitating the product. In order to show that innovation is achieved from competition and not from patents, the plaintiff initially must show that competition is important for innovation: thus, the necessity of proving the first factor—that the market provides incentives to innovate. Demonstrating

²⁴⁹ A concern still may linger that monopolists should not be found to violate the Sherman Act based on activities that have not traditionally been considered “bad acts.” And it is true that refusals to license are expressly permitted under the patent laws. *See* 35 U.S.C. § 271(d)(4) (providing that a refusal to license does not constitute patent misuse). But without being able to analyze the patent-based actions of companies, the antitrust laws will not play a sufficient role in attaining innovation. Any conceivable chilling effect on companies that refrain from enforcing their patent will be minor and will not outweigh the increase in welfare from applying the antitrust laws where competition is the catalyst for innovation.

Moreover, the remedy can be tailored to the situation. Divestiture, for example, would not be called for in nearly any imaginable situation. In certain cases, compulsory licensing may be appropriate, though the patentee likely would be entitled to receive royalties. Although such licensing often is decried as eradicating incentives to innovate, empirical studies call this contention into question. *Infra* note 366. The heavy hand of antitrust can be wielded with care, and if it is so used, then the opening of two paths to innovation will offer significant rewards.

²⁵⁰ *Supra* Part II.C.

²⁵¹ Several well-respected studies by economists on how innovation is achieved in certain industries will provide strong support for this determination. *See infra* note 340 (listing studies). Monopolists in industries that, according to the studies, are characterized by patent-centered innovation would maximize their chances of rebutting the studies’ conclusions by offering evidence that the industries have changed materially since the time of the studies—either because of the introduction of new technologies or markets or because of a fragmentation of the industry into subcategories. *See infra* note 278 (explaining that advances in technology are lowering the costs of development in the biotechnology industry).

Moreover, additional studies should be undertaken, particularly covering industries not yet examined. If litigation arises in industries for which studies have not been completed, the courts and parties will need to focus even more directly on each of the factors of the rebuttal. While there may be a concern that the inquiry could devolve into a “battle of the experts,” a consensus has formed in many industries on the primary catalysts to innovation, and the factors to be applied are straightforward enough to ease the task confronting courts.

this factor justifies the application of Section 2 as it reveals that the competition that Section 2 could unleash naturally would lead to enhanced innovation.²⁵²

The next task is to show that patents are not critical to innovation. The standard utilitarian justification for patents is that they address the “public good” characteristics of inventions by increasing appropriability and preventing imitation by free riders.²⁵³ This rationale is most compelling when the inventor has expended significant time and resources in developing the product, but the product could easily be imitated by competitors after development.²⁵⁴ In that case, patent protection is crucial to allow the inventor to recoup its substantial investments. But patents are not as critical when the product is easy to create (because the initial costs can be more easily recovered) or difficult to imitate (because of the diminished risk of imitation by free riders). And even though patents are least needed when the product is both easy to create and difficult to imitate, the presence of only one of these criteria is enough to assuage the most pressing concerns presented by the public good characteristics of patents. Because patents are not as essential in these situations, there is less concern that applying antitrust law and modestly weakening patents would interfere with innovation.²⁵⁵

In short, in addition to proving the first factor, the plaintiff must prove *either* the second (ease of creation) or third (difficulty of imitation) factors in order to show that *ex ante* incentives favor the application of Section 2.

²⁵² If studies had conclusively shown that markets comprising small firms attained more innovation than markets dominated by monopolists, then there might be less of a need to examine market-based incentives to innovate in applying Section 2. But despite much attention, this issue has not been resolved. See *infra* note 316 (noting debate among economists as to whether innovation occurs in markets characterized by monopoly or competition). Therefore, the factor targets those instances in which the application of Section 2 promises to contribute to competition-based incentives to innovate by opening up opportunities such as enhanced competition in network effects markets.

²⁵³ *Supra* notes 6-9 and accompanying text.

²⁵⁴ Cf. SUZANNE SCOTCHMER, CUMULATIVE INNOVATION IN THEORY AND PRACTICE 17 (Goldman Sch. of Pub. Policy, Working Paper No. 240, 1999) (questioning whether “cheap to develop” basic inventions should receive patent protection), available at <http://socrates.berkeley.edu/~scotch/cum-r%26d.pdf>; Giovanni Dosi, *Sources, Procedures, and Microeconomic Effects of Innovation*, 26 J. ECON. LITERATURE 1120, 1161 (1988) (noting that ease of imitation is inversely related to appropriability).

²⁵⁵ Of course, another potential solution to the varying degrees of reliance on patents across industries is to modify the patent laws by industry. For a comparison of that solution to this Article’s proposal, see *infra* Part IV.C.

a. *Nonpatent market-based rewards*

The first ex ante factor focuses on nonpatent-based incentives to innovate that originate in the relevant industry. In certain industries, the incentives provided by patents may not be as critical as is competition in encouraging innovation. While this does not alter the validity of patents in such industries, it may recommend a more potent role for antitrust. For example, competition-induced innovation played a crucial role in the rebirth of the steel and automobile industries²⁵⁶ and the growth of consumer-goods industries in the United States in recent generations.²⁵⁷ A significant nonpatent incentive to innovate is the advantage from being the first to enter a market—in other words, a “market pioneer.”²⁵⁸

In some industries, such as pharmaceuticals, cigarettes, oil-drilling rigs, and investment banking, market pioneers have maintained significant market shares long after they entered the market.²⁵⁹ The computer²⁶⁰ and semiconductor²⁶¹ industries also reward the first to arrive in a market. And in consumer goods businesses, pioneers have amassed twenty-nine percent of the market while late entrants gained only twelve percent.²⁶² Such market dominance usually is explained by customer familiarity and brand loyalty.²⁶³ In addition, the first com-

²⁵⁶ 1 FED. TRADE COMM’N, *ANTICIPATING THE 21ST CENTURY: COMPETITION POLICY IN THE NEW HIGH-TECH, GLOBAL MARKETPLACE*, at ch. 6, at 14 (1996) [hereinafter *FTC REPORT*].

²⁵⁷ *Id.*; see also *id.* ch. 6, at 14 n.67 (reporting testimony from a Visa International official that innovation in industry has been spurred by a need to keep up with business and to lower costs).

²⁵⁸ William T. Robinson et al., *First-Mover Advantages from Pioneering New Markets: A Survey of Empirical Evidence*, 9 *REV. INDUS. ORG.* 1, 6 (1994).

²⁵⁹ *Id.* For example, two years after the expiration of patents, the average market share of pioneers in pharmaceutical markets was fifty-one percent. *Id.* at 5.

²⁶⁰ See *FTC REPORT*, *supra* note 256, ch. 6, at 15 (noting that time to market is “extremely important” in the computer industry).

²⁶¹ See *id.* (observing that in the semiconductor industry, “rapid introduction of a new process and the ability to expand the volume of product moving through . . . [are] extremely important to profitable competition . . . simply because your window of opportunity is relatively brief, and therefore, it is important to move quickly and . . . with relatively high quality”).

²⁶² Robinson et al., *supra* note 258, at 9. In the market for industrial goods, pioneers gained twenty-nine percent of the market and late entrants gained fifteen percent. *Id.*

²⁶³ Customer demands also may contribute to the competition to innovate. See *FTC REPORT*, *supra* note 256, ch. 6, at 16 (quoting testimony of an IBM executive that “unrelenting consumer demands” for computing capability “fuel[] the impetus” for “innovation and commercialization of new technologies . . . proceeding at a breakneck pace”).

pany to head down learning curves also may obtain cost advantages, which can be used to quickly recoup development costs and even to block entry.²⁶⁴ R&D executives generally consider “lead time” over competitors to be one of the most effective appropriability mechanisms.²⁶⁵ While pioneers do not always encounter success,²⁶⁶ they generally survive at least as long as later entrants in many industries.²⁶⁷ A type of market in which first-mover status is particularly important is a “network effects” market.

Network effects occur in markets in which a participant benefits from an increase in the number of other participants in the system. For example, a telephone or email system becomes more valuable as the number of people connected to it increases.²⁶⁸ Network effects result in increasing returns in consumption: as more customers join a network, the network becomes more valuable.²⁶⁹ Relatedly, networks feature positive feedback: the more popular a computer operating system becomes, for example, the more applications will be written for it. And as these additional applications become available, the system becomes even more popular, leading to even more applications being written, and so on. One concern with such positive feedback is that, as the popular product becomes increasingly valuable, consumers will flock to that product, resulting in a market “tipping” to the product and eliminating all other alternatives in the market.²⁷⁰ Such tipping could theoretically leave consumers stranded with (or “locked in to”)

²⁶⁴ SCHERER & ROSS, *supra* note 6, at 627. Moreover, competition will not always drive prices so low that earlier development costs cannot be recovered. AREEDA & KAPLOW, *supra* note 2, at 153.

²⁶⁵ WESLEY M. COHEN ET AL., PROTECTING THEIR INTELLECTUAL ASSETS: APPROPRIABILITY CONDITIONS AND WHY U.S. MANUFACTURING FIRMS PATENT (OR NOT) 10 (Nat'l Bureau of Econ. Research, Working Paper No. 7552, 2000).

²⁶⁶ Market pioneers that were quickly overtaken by later entrants include Reynolds International Pen (ballpoint pens), Bowmar Instruments (hand-held electronic calculators), Osborne (portable computers), and Royal Crown Cola (diet and caffeine-free colas). Robinson et al., *supra* note 258, at 6.

²⁶⁷ Pioneers survive at least as long in the pharmaceutical and consumer packaged goods industries, but not in the chemical product and local newspaper industries. *Id.* at 17. And in the medical diagnostic imaging industry, later entrants have survived longer. *Id.*

²⁶⁸ These effects are present not only in physical networks (with “direct” network effects) but also in virtual networks like the markets for videotape players and videogame consoles (with “indirect” network effects). In these systems, the greater prevalence of the primary product increases the demand for complementary products like videotapes and videogame cartridges.

²⁶⁹ David S. Evans & Richard Schmalensee, *A Guide to the Antitrust Economics of Networks*, 1996 ANTITRUST 36, 36.

²⁷⁰ *Id.* at 36-37.

the product that loses the race, a product that might even be superior to the dominant product, but one that fails to gain market share because it does not offer a populated network. The fears of inferior lock-in nonetheless appear to outrun the reality.²⁷¹

Network effects markets provide a clear illustration of market-based incentives for innovation. These markets offer significant rewards, such as (at least temporary) market domination, to the first to arrive in the market. Because of these rewards, innovation is fueled by the fierce competition to arrive first and gain the critical mass of participants that will foster the self-fulfilling prophecy of success; any incentives provided by patents, consequently, are less critical.²⁷² Schumpeter's "gale of creative destruction"²⁷³ whips fiercely through network markets, providing a powerful example of competition-based innovation.²⁷⁴

b. *Product creation*

The second *ex ante* incentive relates to the creation and development of the product. Where the expense and time necessary to invent and commercialize a product is significant, the importance of patents increases. In cases in which the cost of innovation is high, in-

²⁷¹ One commentator concludes that "[t]here are no industries in which the prevailing technology is demonstrably the wrong one or one in which a clearly more efficient technology has been suppressed, where 'efficiency' is defined to include recognition of switching costs." Timothy J. Muris, *The FTC and the Law of Monopolization*, 67 ANTITRUST L.J. 693, 719 (2000). An oft-cited example of inferior lock-in is the "QWERTY" keyboard layout. But studies have pointed out flaws in tests of a supposedly superior alternative ("DVORAK"). See Stan Liebowitz & Stephen Margolis, *The Fable of the Keys*, 33 J.L. & ECON. 1, 8-15 (1990) (comparing DVORAK to QWERTY). It is also worth considering "LP" records (which lost to CDs), Betamax videos (to VHS), and Atari video games (to Nintendo), all of which were once viewed as network effects monopolists not subject to displacement.

²⁷² See O'Rourke, *supra* note 29, at 1216 ("[B]ecause significant first-mover advantages and returns larger than those of conventional markets often characterize network markets, investors may not need the inducement of intellectual property rights at all to encourage them to fund innovation.").

²⁷³ SCHUMPETER, *supra* note 14, at 81-86.

²⁷⁴ Monopolists in network effects markets will not be immune from challenge. Even if there are demand-side barriers to entry in network effects markets, potential entrants will not face supply-side barriers. Moreover, for those companies not yet in the market, any psychological barriers to entry would appear to be reduced by the significant expected payoff from cracking into the market. Ronald A. Cass & Keith N. Hylton, *Preserving Competition: Economic Analysis, Legal Standards and Microsoft*, 8 GEO. MASON L. REV. 1, 36-37 (1999). In short, the potential rewards of dominating a network effects market provide powerful incentives not only for the firm that arrives first, but also for subsequent entrants seeking to enter the market.

ventors and investors would be reluctant to expend the resources necessary to develop inventions without the right to exclude. Conversely, where invention and development do not require significant time or expense, patents are less important.²⁷⁵

The expenditures required for innovation will vary across industries. In the fields of pharmaceuticals, chemicals, biotechnology (at least for downstream innovation), and agricultural products, the cost of searching for the next breakthrough can be prohibitive.²⁷⁶ Biopharmaceutical²⁷⁷ companies often spend hundreds of millions of dollars and take ten to fourteen years to bring new drugs to market.²⁷⁸

²⁷⁵ Of course, firms may seek patents for reasons other than preventing imitation. For example, they could obtain patents to prevent infringement lawsuits, to enhance reputation, to prevent competitors from patenting related inventions, to strengthen the firm's bargaining position in entering into cross-licensing agreements, or to increase the likelihood of financing by venture capitalists. COHEN ET AL., *supra* note 265, at 17; Mark A. Lemley, *Rational Ignorance at the Patent Office*, 95 NW. U. L. REV. 1495, 1505-06 (2001); see also BRONWYN H. HALL & ROSE MARIE HAM, THE PATENT PARADOX REVISITED: DETERMINANTS OF PATENTING IN THE U.S. SEMICONDUCTOR INDUSTRY, 1980-94, at 23 (Nat'l Bureau of Econ. Research, Working Paper No. 7062, 1999) (stating that, in the semiconductor industry, the desire to gain leverage in cross-licensing negotiations is a strong motivation to seek patents). This Article will focus on the use of patents to prevent copying and to recover initial development costs. For even if the magnitude of the appropriability function often attributed to patents is lower than the traditional justification would posit, it still varies by industry and appears to be a significant contributor to innovation in several industries. See *infra* notes 276-82 and accompanying text (explaining substantial costs of innovation in certain industries).

²⁷⁶ See FTC REPORT, *supra* note 256, ch. 6, at 7-8 (reporting that representatives of pharmaceutical and biotechnology industries testified at competition policy hearings that patents are critical for protecting the "large, upfront" investments necessary to research and develop new drugs); SCHERER & ROSS, *supra* note 6, at 626-27 (stating that introduction of a new drug into the U.S. market involves significant research, development, and testing costs incurred in "discovering molecules with desirable therapeutic effects in humans and proving through extensive clinical testing that the substances were effective and safe").

²⁷⁷ Because of the recent convergence of the biotechnology and pharmaceutical industries, *supra* note 23, the processes of innovation will overlap among firms in the industries.

²⁷⁸ See TAYLOR & SILBERSTON, *supra* note 175, at 251 (explaining the time it takes to establish the properties of a compound, perform preliminary tests, transform the compound into a marketable product, master the production processes, and receive acceptance by doctors); Rebecca S. Eisenberg, *Bargaining over the Transfer of Proprietary Research Tools: Is This Market Failing or Emerging?*, in EXPANDING THE BOUNDARIES OF INTELLECTUAL PROPERTY: INNOVATION POLICY FOR THE KNOWLEDGE SOCIETY 223 (Rochelle Cooper Dreyfuss et al. eds., 2001) (finding that it costs \$175 to \$300 million to develop a new biotechnology medicine and \$300 to \$500 million to develop a new pharmaceutical drug); Joan Hamilton, *Biotech: An Industry Crowded with Players Faces an Ugly Reckoning*, BUS. WK., Sept. 26, 1994, at 84, 87 (describing the costs of bringing new drugs to market); Edwin Mansfield, *Patents and Innovation: An Empirical Study*, 32 MGMT. SCI. 173, 174 (1986) (noting that chief R&D executives would not have devel-

These companies must pass through multiple stages of innovation, such as discovering the relevant molecules with therapeutic effects, undertaking thorough clinical testing, undergoing significant FDA review, and developing, manufacturing, and marketing the drug.²⁷⁹ Only one out of every four thousand discovered compounds tested in

oped sixty percent of pharmaceutical inventions absent patent protection); PHARM. RESEARCH AND MFRS. OF AM. (PHARMA), PHARMACEUTICAL INDUSTRY PROFILE 2001, at ch. 9, at <http://www.phrma.org/publications/publications/profile01/chapter9.phtml> (2002) (“On average, it takes 14.2 years and costs \$500 million to develop a new medicine.”). The biotechnology industry also has had difficulty in attracting investment due to the high frequency of unsuccessful projects. See Josh Lerner, *The Returns to Investments in Innovative Activities: An Overview and an Analysis of the Software Industry* 23 (NERA Consulting Economists, Working Paper Draft, 1998) (“Only 22 biotechnology-based therapeutics and vaccines were approved between 1975 and 1993[, and by 1993,] the industry as a whole was losing \$3.6 billion annually.”), available at http://www.neramicrosoft.com/level_1/nera_an.htm (pdf file).

Due to recent and potential future advances, conclusions related to the biopharmaceutical industry may need to be revisited. For example, the cost of locating a gene fragment of unknown function is now an insignificant part of the cost of determining its function—estimated by one CEO of a bioinformatics company to be one percent. Arti K. Rai, *The Information Revolution Reaches Pharmaceuticals: Balancing Innovation Incentives, Cost, and Access in the Post-Genomics Era*, 2001 U. ILL. L. REV. 173, 192 n.88. Even the more difficult commercialization stage might be simplified in the future by an expanded application of information technology to genome data (i.e., genomics). See *id.* at 174-75 (discussing the impending era of pharmaceutical innovation). To the extent that different stages of invention, development, and commercialization in an industry differ markedly in the catalysts for innovation, the “industry” might need to be subdivided into more internally consistent units.

A final concern presented by the biotechnology industry is that of broad “upstream” (assuming, for the moment, cognizable distinctions based on the distance of the patented input from the end product) patent rights in research that, because of significant transaction costs facing “downstream” developers that need to enter into licensing agreements with such rights-holders, could stifle innovation. For a general discussion, see Michael A. Heller & Rebecca S. Eisenberg, *Can Patents Deter Innovation? The Anticommons in Biomedical Research*, 280 SCIENCE 698 (1998). A more rigorous application of the patent laws, such as prohibiting patents on gene fragments, could (at least partially) mollify this concern. And to the extent that such upstream innovations are not labor-intensive or expensive, they provide further support for subdividing the biotechnology industry for purposes of the test proposed by this Article.

²⁷⁹ See Rai, *supra* note 278, at 181 (noting that prescription drug manufacturers must provide preclinical testing on animals, file a drug application with the FDA, undertake three stages of clinical/human testing, and undergo final FDA review); see also SCHERER & ROSS, *supra* note 6, at 626 (discussing costs that are unique to drug introduction); TAYLOR & SILBERSTON, *supra* note 175, at 231 (concluding, based on a study of the importance of patents in Great Britain in the 1960s, that “[t]he pharmaceutical industry stands alone in the extent of its involvement with the patent system”); VISCUSI ET AL., *supra* note 20, at 848 (describing how, after the completion of the three testing stages, an application is filed with the FDA that covers clinical trials of more than 3000 patients and contains 90,000 pages, and that, after two and a half more years, the FDA gives its decision).

industry laboratories passes through each of the stages and reaches the marketplace.²⁸⁰

As another example, R&D for new chemical products is uncertain and subject to much experimentation, since it is difficult to predict the exact chemical structure that will achieve a given end and since there often are unanticipated effects of using a new chemical substance in a particular way.²⁸¹ Patents also may be effective appropriability mechanisms in the medical equipment, toilet preparations, pipes/valves, special purpose machinery, oil field machinery, switch-gear, petroleum, and autoparts industries.²⁸²

On the other hand, patents are not necessary for innovation in many industries. Internet business methods—most famously symbolized in Amazon's "one-click"²⁸³ patent—are usually simple ideas easily conceived.²⁸⁴ Patents also play a relatively minor role in the creation of products in the civilian aircraft and semiconductor industries²⁸⁵ and for office equipment, motor vehicles, rubber products, textiles, primary metals, instruments, food, printing/publishing, steel, and electric components.²⁸⁶ In these industries, in which firms do not consider

²⁸⁰ Alan M. Fisch, *Compulsory Licensing of Pharmaceutical Patents: An Unreasonable Solution to an Unfortunate Problem*, 34 JURIMETRICS J. 295, 303 (1994).

²⁸¹ Robert P. Merges & Richard R. Nelson, *Market Structure and Technical Advance: The Role of Patent Scope Decisions*, in ANTITRUST, INNOVATION, AND COMPETITIVENESS, *supra* note 22, at 185, 209 (discussing invention in the chemical industries). This uncertainty, of course, also applies to chemical compounds in the pharmaceutical area. TAYLOR & SILBERSTON, *supra* note 175, at 252.

²⁸² See COHEN ET AL., *supra* note 265, at 12 (listing the industries in which patents are most critical); *id.* at 32 tbl. 1 (listing the effectiveness of appropriability mechanisms for various product innovations); Richard C. Levin et al., *Appropriating the Returns from Industrial Research and Development*, 1987 BROOKINGS PAPERS ON ECON. ACTIVITY 783, 793-98 (relaying effectiveness of patents in various industries). There typically will not be a substantial divergence in the effectiveness of patents between product and process innovations. COHEN ET AL., *supra* note 265, at 32-33 tbls. 1 & 2.

²⁸³ Stated most simply, "one-click ordering" involves the server system "remembering" information from the client system such as the customer's address and credit card number and automatically recalling the information during the customer's subsequent order. U.S. Patent No. 5,960,411 (issued Sept. 28, 1999); Linda R. Cohen & Roger G. Noll, *Intellectual Property, Antitrust and the New Economy*, 62 U. PITT. L. REV. 453, 468 (2001).

²⁸⁴ In fact, many such methods had already been utilized outside the Internet before being patented.

²⁸⁵ For a discussion relating to these industries, see A. PHILLIPS, *TECHNOLOGY AND MARKET STRUCTURE: A STUDY OF THE AIRCRAFT INDUSTRY* (1971); JOHN R. TILTON, *INTERNATIONAL DIFFUSION OF TECHNOLOGY: THE CASE OF SEMICONDUCTORS* (1971); and Richard C. Levin, *The Semiconductor Industry*, in GOVERNMENT AND TECHNICAL PROGRESS: A CROSS-INDUSTRY ANALYSIS 9 (Richard R. Nelson ed., 1982).

²⁸⁶ COHEN ET AL., *supra* note 265, at 32 tbl. 1 (reporting low mean percentages of

patents to be effective appropriability mechanisms,²⁸⁷ a more rigorous application of antitrust would not have an adverse effect on innovation.

c. *Ease of imitation*

The final factor involves the inventor's ex ante determination of the ease of imitation of the product after it is developed.²⁸⁸ The easier it is for competitors to imitate a product, the greater is the need for patents. Once a new chemical structure (which is expensive to develop) is marketed, for example, the cost of imitation is low.²⁸⁹ After the correct compound and production processes are established, bulk manufacture and formulation methods can readily be imitated.²⁹⁰ Consequently, certain generic pharmaceutical firms "specialize in copying brand-name products after the brand product's patent expires."²⁹¹ On the other hand, the more difficult imitation is, the less

product innovations for these industries). A survey of R&D executives revealed that, within a two-year period, one hundred percent of inventions in the office equipment, motor vehicles, rubber products, and textiles industries, and ninety-nine percent in the primary metals and instruments industries, would have been developed even without patent protection. Mansfield, *supra* note 278.

²⁸⁷ See, e.g., COHEN ET AL., *supra* note 265, at 10 (reporting that managers consider secrecy and lead time to be the two most effective appropriability mechanisms); Levin et al., *supra* note 282, at 796 (demonstrating that, in their companies' R&D, managers in only the chemical and petroleum refining industries believed that process patents were important, while managers in only the chemical and steel mills industries thought that product patents were important); Merges & Nelson, *supra* note 281, at 217 ("[I]n most industries advantages associated with a head start, including establishment of production and distribution facilities, and moving rapidly down a learning curve, were judged significantly more effective than patents in enabling a firm to reap returns from innovation."); F.M. Scherer, *First-Mover Advantages from Pioneering New Markets: Comment*, 9 REV. INDUS. ORG. 173, 175 (1994) (noting how in most corporations' R&D decisions, patents played "a minor role" and "the necessity of maintaining competitive leadership" and "profits resulting from customer belief in the company's technological leadership" were more critical (quoting F.M. SCHERER ET AL., PATENTS AND THE CORPORATION 117-19 (2d ed. 1959))).

²⁸⁸ The inventor can ascertain this factor before the development of the product based on characteristics of the relevant industry such as the likelihood of reverse engineering.

²⁸⁹ See, e.g., SCHERER & ROSS, *supra* note 6, at 626-27 ("[I]mitators can free ride on most of the innovator's investment."); TAYLOR & SILBERSTON, *supra* note 175, at 251 (noting the minimal research and marketing expense required to copy a drug); VISCUSI ET AL., *supra* note 20, at 820 (discussing the low cost of imitation). Other examples include the fabricated metals and food processing sectors, and some simple machinery. Richard C. Levin, *Patents in Perspective*, 53 ANTITRUST L.J. 519, 521 (1984).

²⁹⁰ TAYLOR & SILBERSTON, *supra* note 175, at 252.

²⁹¹ VISCUSI ET AL., *supra* note 20, at 820. The Levin study found that patents raise imitation costs by forty percent for new drugs and by twenty-five to thirty percent for

necessary patents are: in complicated mechanical engineering industries, such as aircraft, guided missiles, and complex industrial machinery, the difficulty of reverse engineering limits imitation.²⁹²

Firms' views on the effectiveness of patents to prevent copying and to allow recovery of their initial expenditures may demonstrate not only that products in the industries are difficult to create, but also that they are easy to imitate. Further research thus may confirm that patents are essential to prevent imitation in industries such as pharmaceuticals, chemicals, biotechnology, and agricultural products²⁹³ and that they are not critical for semiconductors, civilian aircraft, office equipment, motor vehicles, rubber products, textiles, primary metals, instruments, food, printing/publishing, steel, and electric components.²⁹⁴

Absent patent protection, imitation would not automatically happen in every instance. Imitators take some time to discover the new technology and determine whether it is worth copying.²⁹⁵ They also may have to replicate some of the original R&D. Airplanes, for example, require detailed engineering drawings, tools to produce the parts, prototypes, and thorough testing.²⁹⁶ Despite these caveats, the likelihood of imitation is important in determining the necessity of patents.

The *ex ante* incentives thus reveal the roles of patents and competition in encouraging innovation before the product is created. In industries in which the market provides incentives to innovate and patents are not essential, antitrust can play a more prominent role and need not be as concerned with quashing the incentives underlying the patent system. Such a conclusion is supported in two respects. First, there is less of a concern that any reduction in patent incentives will

chemical products. Levin et al., *supra* note 282, at 811.

²⁹² Levin, *supra* note 289, at 521.

²⁹³ See *supra* notes 276-81 and accompanying text.

²⁹⁴ See *supra* notes 283-87 and accompanying text. For purposes of applying the test proposed by this Article, it is not necessary to determine which of the factors—difficulty of creation, ease of imitation, or both—is responsible for a firm's conclusion on the necessity of patents in an industry, since the satisfaction of *either* of these factors demonstrates the importance of patents for innovation.

²⁹⁵ See SCHERER & ROSS, *supra* note 6, at 626 (describing the results of a study that found that ten years was the average period of time before sixty percent of all relevant producers adopted a technology and explaining that the speed of adoption may be correlated with the profitability of adopting the technology, with companies that set a high price encouraging imitation).

²⁹⁶ *Id.* One study revealed that the R&D costs of duplicating a significant unpatented product exceed fifty percent of the original innovator's costs in 109 of 127 industries. Levin et al., *supra* note 282, at 809.

reduce innovation, since, by definition, patents are not as essential in the industry; second, increasing competition in the industry would contribute to enhanced innovation.

2. Ex Post Perspective

The roles of competition and patents in achieving innovation are also important after the issuance of the patent. A critical factor after the patent has been granted is the cumulative nature of innovation in the industry. In cumulative industries, innovation builds on previously developed products.²⁹⁷ The more that innovation in an industry is cumulative, the more the initial patent may restrict subsequent (or “follow-on”) innovation. In this situation, antitrust—whose focus on competition often accelerates follow-on innovation as competitors race to develop the next product generation—might have a more important role to play. Moreover, carving out a role for antitrust should not substantially reduce the overall incentive to innovate: even if the incentives supporting the initial patent diminish, those for post-patent innovation likely would increase.

Some products will not encounter the problem of cumulative innovation. Discrete inventions, for example, typically do not incorporate numerous interrelated components and are not integral components of a larger, continually developing product or system. So there is less of a concern for these inventions that subsequent innovation will be blocked by a broad initial patent or lack of competition.²⁹⁸

But in many industries, such as automobiles, aircraft, semiconductors, and computer software, innovation is cumulative, with future ad-

²⁹⁷ See generally SCOTCHMER, *supra* note 254 (discussing consequences of cumulative innovation, in which “innovators build on each other’s discoveries”); Suzanne Scotchmer, *Standing on the Shoulders of Giants: Cumulative Research and the Patent Law*, 5 J. ECON. PERSP., Winter 1991, at 29, 29 (“Most innovators stand on the shoulders of giants, and never more so than in the current evolution of high technologies [such as molecular biology, pharmaceuticals, computer text editing, and computer spreadsheets], where almost all technical progress builds on a foundation provided by earlier innovators.”).

²⁹⁸ The toy, consumer goods packaging, and power hand-tool industries are examples of industries with discrete inventions. See Robert P. Merges & Richard R. Nelson, *On the Complex Economics of Patent Scope*, 90 COLUM. L. REV. 839, 880 (1990) (defining discrete inventions as “well-defined, created through the investor’s insight and hard work” and “not point[ing] the way to wide ranging subsequent technical advances”). Merges and Nelson posit four industry models explaining different patterns of technical advance: (1) discrete invention, (2) cumulative technologies, (3) chemical technologies, and (4) science-based technologies. *Id.*

vances building on present technology.²⁹⁹ Computer software, for example, can be viewed as “a series of inventions piled on top of each other.”³⁰⁰ The chemical industry has attributes of both the discrete and cumulative models, as the complex relationship between chemical structure and function precludes cumulative development, but processes are improved in a cumulative fashion.³⁰¹ And science-based technologies (such as biotechnology, lasers, and superconductors) also emphasize cumulative development, with “research and development efforts attempting to exploit recent scientific developments.”³⁰²

In these industries, there is a greater likelihood that an unpromising deference to patents would limit post-patent innovation.³⁰³

²⁹⁹ HALL & HAM, *supra* note 275, at 2-3; Jorde & Teece, *supra* note 175, at 48; Levin et al., *supra* note 282, at 788. Also, molecular biologists consistently have relied on a technique for inserting genes into bacteria developed in the early 1970s, and drugs like insulin and antibiotics have been improved through successive innovations. Scotchmer, *supra* note 297, at 29.

³⁰⁰ FTC REPORT, *supra* note 256, ch. 8, at 18 (citation omitted); *see also* Scotchmer, *supra* note 297, at 29 (“Computer text editors are similar to one another, as are computer spreadsheets, in large part because innovators have inspired each other.”). Besen and Maskin demonstrate that because of the sequential and complementary nature of innovation in the software industry, patent protection has reduced innovation and social welfare. They substantiate their hypotheses with observations of cross-licensing in the computer and semiconductor industries, the positive relationship between innovation and firm entry, and the correlation between the extension of patent protection to software in the 1980s and a relative decline in R&D activity. JAMES BESSEN & ERIC MASKIN, SEQUENTIAL INNOVATION, PATENTS, AND IMITATION (MIT, Working Paper No. 00-01, 2000), available at <http://www.researchoninnovation.org/patent.pdf>.

³⁰¹ Merges & Nelson, *supra* note 298, at 882-83.

³⁰² *Id.* at 883 (footnote omitted).

³⁰³ As Merges and Nelson show, granting broad “pioneer” patents in cumulative technology industries may limit innovation in a field after issuance of the patent. *See id.* at 884-94 (documenting the effects of pioneer patents on the electrical lighting, automobile, airplane, radio, and semiconductor industries). A famous example is Thomas Edison’s broad patent encompassing the use of a carbon filament as the source of light: once the courts had validated this patent, the pace of improvements slowed and Edison’s company nearly doubled its market share. ARTHUR A. BRIGHT, JR., THE ELECTRIC-LAMP INDUSTRY: TECHNOLOGICAL CHANGE AND ECONOMIC DEVELOPMENT FROM 1800 TO 1947, at 91-93 (1949). Bright noted that Edison’s competitors had quickly improved their lamp before the enforcement of the patent, but that “[a]fter the original introduction of the incandescent lamp and its first rapid changes . . . the Edison Electric Light Company did not introduce many important new developments. Edison himself turned to other problems, and the company’s technical leadership in incandescent lighting was not revived until after the [1876] merger [forming General Electric].” *Id.* at 122.

Another example is the Wright brothers’ patent on an expansive airplane stabilization and steering system, which many believe limited the pace of aircraft development in the United States. *See* Merges & Nelson, *supra* note 298, at 890-91 (noting that dur-

Compounding this harm, in many of these industries, competitors in an open marketplace would race to improve upon the initial patent.³⁰⁴ But this competition does not get a chance to contribute when blocked by the twenty-year right to exclude. So antitrust's significant role in achieving innovation should be recognized in these circumstances, and the presence of cumulative innovation should make courts more likely to apply Section 2.

3. Operation of the Rebuttal

By way of recap and further explanation, a plaintiff must demonstrate the first *ex ante* factor—that there are market-based nonpatent incentives to innovate in the industry. Proof of this element ensures that courts' application of Section 2, by fostering competition, actually will increase innovation.

The plaintiff also must prove at least one of the other two *ex ante* subissues—that the product is easy to create or that it is difficult to imitate.³⁰⁵ Requiring one of these factors to be met ensures that the presence of market-based incentives alone does not trigger the conclusion that patents are not necessary in the industry. After all, such incentives could apply in industries (e.g., the pharmaceutical industry) in which patents also are critical. The second and third factors highlight a prospective inventor's lack of a need for patents. In an industry in which a product is easy to create and difficult to imitate, it is inconceivable that patents are necessary to recoup up-front expenditures and to keep away free riders. And where one of these conditions is met, the likelihood that patents are essential is vastly diminished—either because a product that is easy to copy did not require substantial expenditures to create, or because a product that is difficult to create cannot easily be imitated. Thus, the plaintiff must demonstrate only the second *or* third *ex ante* factor to show that patents are not essential for innovation.

The *ex post* determination focuses on the cumulative nature of innovation in the industry after the issuance of the patent. The more

ing World War I, the Secretary of the Navy insisted on automatic cross-licensing to avoid the anticompetitive effects of the patent).

³⁰⁴ See SCHERER & ROSS, *supra* note 6, at 635 (providing evidence of increased invention by monopolists when challenged by smaller competitors).

³⁰⁵ The plaintiff will satisfy the rebuttal in the automobile, semiconductor, computer software, and Internet industries. See *supra* Parts III.B.1-2 (discussing how the plaintiff can rebut the presumption of lawfulness in industries in which competition, rather than patents, is the catalyst for innovation).

that innovation is based on predecessor inventions, the greater should be the role for antitrust. Vigorous competition among participants in the market to develop the next generation of products will lead to more post-patent innovation than an uncompromising deferral to the incentives that encouraged the patentee to create the original product.

The rebuttal applies only when both the *ex ante* and *ex post* perspectives favor competition. Applying Section 2 is strong medicine, so we must be certain that it should be prescribed. The conjunction of the two effects guarantees that competition plays a critical role in innovation, both before and after the patent grant, and along the axes of appropriability and the paths of innovation. Moreover, the high bar that the rebuttal sets prevents overenforcement of the antitrust laws and interference with patent incentives in cases in which only one of the perspectives is met, namely where: (1) competition (and not patents) is necessary for innovation, but post-patent innovation is not affected (e.g., in certain industries with discrete invention), or (2) the industry is marked by cumulative innovation, but patents are essential for innovation (e.g., the biotechnology industry). If the rebuttal is met, then, by definition, any reduction in patent-based incentives to innovate is less troubling, and the application of antitrust will promote innovation.³⁰⁶

Finally, in cases in which it is ambiguous whether any of the stages—presumption, rebuttal, or surrebuttal³⁰⁷—applies, the courts' default position should be that the action is lawful. So, for example, in industries in which *both* patents and competition are important in achieving innovation (e.g., the pharmaceutical industry), and in industries in which *neither* is important (e.g., food products and metalworking),³⁰⁸ Section 2 should not apply.³⁰⁹ Such a position limits interference with patent incentives in cases where courts are not certain that such interference is warranted or that the application of Section 2

³⁰⁶ Cf. Lao, *supra* note 120, at 215-16 (concluding that limiting patent rights in industries in which they are not critical to innovation "would not necessarily deter innovation").

³⁰⁷ See *infra* Part III.C for a discussion of the surrebuttal.

³⁰⁸ More specifically, industries in which neither patents nor competition-based incentives are critical include the milk, meat products, iron and steel foundries, boiler shops, and screw machine products (nuts, bolts, and screws) industries. Levin et al., *supra* note 282, at 802.

³⁰⁹ For a concrete application of this approach, see *infra* text accompanying notes 375-78.

will enhance innovation.³¹⁰ This approach also is consistent with the relative error costs of applying antitrust analysis.³¹¹

C. *The Surrebuttal*

Just because the monopolist operates in a particular industry does not mean that it automatically has violated Section 2. So where the rebuttal applies,³¹² the monopolist will have a chance to offer a surrebuttal. The *rebuttal* connotes the conceptual industry-wide conclusion that competition is necessary for innovation; the *surrebuttal* allows the defendant to rebut this overview with actual evidence that the relevant market in the industry³¹³ is in fact marked by innovation.³¹⁴ In a fast-

³¹⁰ In other words, the test errs on the side of applying the antitrust laws in an underinclusive fashion. But by conducting the analysis at the level of industry, it cabins the underinclusiveness (even accounting for the costs of administering the test) by forging a tighter fit with welfare than that offered by global, non-industry-based approaches.

³¹¹ The “error costs” approach draws on the often-voiced contention that false convictions (in which a defendant is wrongfully found guilty of, say, monopolization) are more harmful than false acquittals (in which the defendant is wrongfully exonerated). Several arguments support such a contention.

First, false convictions may increase litigation and encourage plaintiffs to redress their grievances in court. This is particularly true where the act challenged is based on a patentee’s right to exclude, which plaintiffs may always view as a justified trigger for a lawsuit. Second, and relatedly, such errors may encourage monopolists to compete less vigorously and to enter into agreements with their competitors. Third, false convictions cannot be remedied by the marketplace—once the defendant is found guilty, it may be forced to leave the market or, at a minimum, will likely be much weaker than it had been (and should have been). Nor can the deterrent effect of such convictions on innovation easily be corrected. False acquittals, on the other hand, often (though not always) can be remedied through the marketplace, as exonerated monopolists are still subject to the demands of the market, particularly in high-technology markets, where the tide of competition continually threatens to erode monopoly. *See generally* Cass & Hylton, *supra* note 274, at 30-33 (discussing why false convictions of monopolists cost “far more” than false acquittals). The costs of false convictions are even greater where they affect not only the competition process but also the incentives underlying the patent system.

³¹² Obviously, where the presumption but not the rebuttal applies, as in industries in which patents play a critical role in innovation, the activity will be presumed lawful.

³¹³ Although the relative roles of patents and competition in attaining innovation should be constant throughout industries, the actual levels of innovation experienced may vary by market within any particular industry. For example, patents may be critical to innovation across the entirety of the pharmaceutical industry, but markets for different drugs might reveal varying levels of innovation. The relevant market will typically be the market in which the patentee’s activity occurs. In certain situations, it might encompass downstream or related markets. While an effect in a related market will not, standing alone, penalize the monopolist—in contrast to the test offered by some commentators that focuses solely on the number of markets implicated, *supra* Part I.C.2—the absence of innovation in a competition-centered related market could

paced market with new and improved products and services, Section 2 should not be viewed as the “icing on the cake” that would promote even more innovation.³¹⁵ The presence of innovation demonstrates that, even if competition is necessary, the market is already providing enough incentives for the monopolist actually to offer innovation.³¹⁶ So by focusing the surrebuttal on actual levels of innovation in the market, the test concludes on the output central to the Article and ensures that it will operate only in markets that lack innovation.

D. Applications

In an effort to give more shape to the rebuttable presumption, let

prevent the defendant from proving the surrebuttal.

³¹⁴ The amount of innovation need not clear some predefined positive threshold. Some true (i.e., nonsham) innovation is enough. Cf. Hovenkamp, *supra* note 135, at 1045 (“[A]n act of innovation should never be condemned under section 2 unless it is some kind of ‘sham.’”). But if, for example, a market is not benefitting from new and improved products, while other analogous markets are, then the lack of innovation should be apparent. Finally, because of the unique importance of innovation, discussed *supra* notes 233-37 and accompanying text, and the difficulties of trading off increases in innovation against increases in prices—how much increase in price, for example, would justify a small increase in innovation?—innovation (and not price) is the only output that courts should analyze. The test thus errs on the side of recognizing modest amounts of innovation rather than second-guessing such innovation and assuming the possibility of additional innovation. See *supra* note 311 (explaining the “error costs” approach and the contention that false convictions are more harmful than false acquittals).

³¹⁵ The surrebuttal also ensures that courts view innovation as an unmitigated benefit, rather than hypothesizing pernicious reasons for the innovation, as the district court did in *Microsoft*: “While Microsoft may not be able to stave off all potential paradigm shifts through innovation, it can thwart some and delay others by improving its own products to the greater satisfaction of consumers.” 84 F. Supp. 2d 9, 26 (D.D.C. 1999) (findings of fact); see also *id.* (dismissing innovations that make Intel-compatible computers more attractive to consumers because they increase the company’s profits and “push the emergence of competition even farther into the future by continuing to innovate aggressively”). The antitrust laws should reward, not punish, enhanced innovation and consumer satisfaction.

³¹⁶ Economists long have debated whether innovation occurs more frequently in markets characterized by monopoly or competition. Compare SCHUMPETER, *supra* note 14, at 87-106 (arguing that monopolists are encouraged to innovate because of scale economies in R&D and increased appropriation of the full value of their ideas), with KENNETH J. ARROW, *Economic Welfare and the Allocation of Resources for Invention*, in *ESSAYS IN THE THEORY OF RISK-BEARING* 144, 156-60 (3d ed. 1976) (arguing that monopolists may have less incentive to innovate than innovators in competitive industries because they have more to lose than competitors). This is still an unresolved question. See, e.g., Scherer, *supra* note 234, at 1011 (“Although there are fairly simple and well-accepted generalizations as to which market structures stimulate the most rapid pace of innovation, the question of what progress rate is socially optimal, and . . . which market structure driving it is best, is extremely complex and poorly settled.”).

us consider how the approach would apply to three hypothetical patentee monopolists: the Bully Monopolist, the Biopharmaceutical Patentee, and the Internet Auctioneer.

1. The Bully Monopolist

The first application involves a monopolist that licenses its patented product only to licensees that agree not to deal with the monopolist's competitors. This example brings to mind (ignoring for the moment the fact that the product is protected by copyright, rather than patent) Microsoft pressuring Intel to support Windows-specific Java rather than cross-platform (i.e., interoperable) Java,³¹⁷ or threatening to cancel Mac Office, a profitable product, unless Apple compromised on unrelated matters.³¹⁸ In this first hypothetical, the presumption of lawfulness is never triggered since the activity makes sense *only* by hurting the monopolist's competitors. Consumers do not benefit in any direct or indirect way from the activity. Nor could the defendant offer a justification based on the recovery of its fixed costs from developing the product. Nor again could the defendant utilize a justification similar to that used to explain exclusive dealing agreements (in which, for example, a distributor agrees to deal with only a particular manufacturer)—that such agreements ensure that the distributor uses its best efforts to market the manufacturer's products.³¹⁹ Here, the only conceivable effect of the conduct is to harm a competitor. Any incentives to innovate underlying the patent system seem wholly irrelevant in the context of such conduct. In short, the presumption of lawfulness will not apply to the conduct which, under current caselaw, likely will violate Section 2 of the Sherman Act.³²⁰

³¹⁷ *Microsoft*, 253 F.3d 34, 77-78 (D.C. Cir. 2001).

³¹⁸ *See* 84 F. Supp. 2d at 95-97, 107-10 (findings of fact) (describing the resulting "Technology Agreement" between Microsoft and Apple Computer); 253 F.3d at 73-75 (discussing various threats to cancel Mac Office and Microsoft's recognition of the importance to Apple of its continued support of the product).

³¹⁹ *See* Posner, *supra* note 238, at 124 (describing how exclusive dealing agreements may promote efficiency by encouraging a distributor to promote the manufacturer's goods). For example, Microsoft's offer to various companies of favorable placement on the Windows desktop or in other places (such as the interactive "Active Desktop") in return for their promotion of Microsoft's browser, Internet Explorer, served as a potential means to promote Microsoft's product, an act that made sense even if it did not injure Microsoft's competitors.

³²⁰ *See, e.g., Aspen Skiing Co. v. Aspen Highlands Skiing Corp.*, 472 U.S. 585, 608 (1985) (finding a Section 2 violation where a monopolist "fail[ed] to offer any efficiency justification whatever" for withdrawing from a joint arrangement with a competitor and consequently lost business); *Lorain Journal Co. v. United States*, 342 U.S.

2. The Biopharmaceutical Patentee

Case 2 recalls the hypothetical example of CureFinder introduced at the beginning of the Article.³²¹ A monopolist biopharmaceutical company discovers the gene responsible for a disease and the protein coded by the gene, and it develops, extensively tests, and markets a drug that appears to cure the disease. It then refuses to share with a competitor the patented drug it develops. This conduct will be presumptively lawful, and the rebuttal will not apply.

First, the presumption applies since CureFinder's conduct is based on the patent and has a business justification: exploiting the patent to recover its extensive initial investment. Second, the rebuttal does not apply, chiefly because patents are critical to innovation in the fields of pharmaceuticals and (particularly for downstream development) biotechnology.³²² The process of developing and commercializing pharmaceuticals is lengthy and expensive, with many failed leads and no guarantee of success. In addition, once the drug is developed, it is easy for free-riding competitors to replicate this work. So even if there are market-based incentives to innovate, the demonstration by the second and third *ex ante* factors of the importance of patents ensures that innovation in the industry cannot possibly be achieved exclusively through competition. And even if competition is important from the *ex post* perspective—as it seems to be, since biopharmaceutical R&D occurs in a cumulative fashion³²³—an *ex post* effect alone is not enough for the rebuttal to apply. The presence of significant *ex ante* patent-based incentives ensures that the rebuttal does not apply. Consequently, the presumption of legality will carry the day for CureFinder's refusal to license its patented product. CureFinder's actions will not violate Section 2.³²⁴

143, 149-50, 152-53 (1951) (finding that a local newspaper attempted to monopolize the market for local advertising when it refused to accept advertising from parties that also advertised on a competitor radio station); *Stearns Airport Equip. Co. v. FMC Corp.*, 170 F.3d 518, 522 (5th Cir. 1999) (“If the conduct has no rational business purpose other than its adverse effects on competitors, an inference that it is exclusionary is supported.” (citing *Aspen Skiing Co.*, 472 U.S. at 585)).

³²¹ *Supra* Part I.A.2.

³²² *See supra* notes 276-80 and accompanying text (discussing the difficulties of discovering, developing, and marketing new drugs).

³²³ *See supra* notes 301-02 and accompanying text (noting how cumulative development allows R&D to make use of recent scientific advances).

³²⁴ The rebuttal also would not apply in the chemicals industry (in which market pioneers do not survive longer than later entrants, patents are important for innovation, and chemical structures are easy to imitate). Albeit for a different reason—the failure, in industries marked by discrete innovation, of *ex post* considerations to show

3. The Internet Auctioneer

In Case 3, a monopolist Internet company³²⁵ patents an “on-line” auction, through which a consumer seller lists an item for sale, potential purchasers search the listings and bid on the item, and the seller sells the item to the highest bidder.³²⁶ The company refuses to share this patent with a competitor that wishes to apply the bidding concept in an analogous setting. If there is innovation in the market, the sur-rebuttal will apply and the conduct will be upheld, but if there is no innovation, then the rebuttal will apply, with the result that the company has violated Section 2.³²⁷

First, the presumption applies since the defendant rationally can exploit its patented product by refusing to license it. Second, the rebuttal applies, most significantly because there are substantial nonpatent market-based incentives to innovate in the market for Internet auctions. This is a network effects market: the more buyers and sellers that are present at an Internet auction, the more valuable it is. Internet companies thus have very powerful incentives to bring the first Internet auction website to market. Once a customer has located such a site, “bookmarked” it, and told her friends about it, it will be

the necessity of competition—the toy, power hand tool, and consumer goods packaging industries also would not be subject to the rebuttal.

³²⁵ Many Internet and related companies appear to have very significant (perhaps even monopoly) shares of the market. In 2001, for example, Cisco had more than sixty percent of the market for high-speed routers directing traffic on the Internet, and the Palm operating system ran approximately eighty-seven percent of the handheld computers in the market for “personal digital assistants.” Alexei Oreskovic, *Palm Losing Grip on Market Share*, THE INDUSTRY STANDARD, at <http://www.thestandard.com/article/0,1902,23850,00.html> (Apr. 20, 2001); Wylie Wong, *Cisco Widens Lead Against Juniper*, CNET NEWS.COM, at <http://news.cnet.com/news/0-1004-200-6909139.html> (Aug. 17, 2001). In 2000, Oracle software managed databases on more than sixty-five percent of the Unix networks, and Intel had more than eighty percent of the PC microprocessor market. Cade Metz, *PC Sales Down, Chip Competition Up*, PC MAGAZINE, at <http://www.pcmag.com/article/0,2997,s%253D1990%2526a%253D7348,00.asp> (July 11, 2001); Rick Whiting, *Database Market Is Three-Way Race, Report Says*, INFORMATIONWEEK.COM, at <http://www.informationweek.com/story/IWK2001052350012> (May 23, 2001).

³²⁶ See Cohen & Noll, *supra* note 283, at 468 (discussing increases in software patents including patents for “on-line auctions,” which keep competitors from writing software that makes use of the basic idea of auctions).

³²⁷ Some may question whether Internet business methods should be patentable in the first place. But even if the patent system is not adjusted simultaneously with the adoption of the rebuttable presumption, some of these underlying concerns will be addressed by the proposed test. Further, as discussed *infra* Part IV.C, reconciling the conflict between the patent and antitrust laws is a more nuanced approach than merely adjusting the patent system.

that much more difficult for the second Internet auctioneer to convince all of these users to switch to its website.³²⁸

Not only are there market-based incentives to innovate, but the factor relating to the ease of creating the product demonstrates that patents are not necessary. Creating a method for doing business on the Internet is not expensive (it often requires just a programmer and a computer) and often not time-consuming (unlike the search for the next miracle drug, it just requires the development of an often uncomplicated idea).³²⁹

The ex post analysis also demonstrates the necessity of competition. The auction site that is dominant today likely will not be the site that prevails in just a few years (or perhaps even a few months). There are bound to be improvements to, for example, the accuracy and rapidity of responses to bids, the complexity and diversity of features on the site, etc. It would not make sense for future sites to be developed out of thin air, invented around the current patented auction, but for improvements to be made to the presently operated site. Competition among web designers to create the next auction site will optimize post-patent development of the market. Since the ex ante and ex post considerations both recognize the role of competition in achieving innovation, the rebuttal applies.³³⁰

The auction site monopolist then has a chance to show the presence of innovation in the market. Has innovation ground to a standstill? This would be the case if, say, the market for Internet auctions has failed to progress while other analogous markets (like markets for other consumer-to-consumer websites) have incorporated new (and readily transferable) generations of technologies. Or is the market characterized by the fast-paced development of new products and services? The answer to this question will determine if the surrebuttal is met and, consequently, if the monopolist has violated Section 2. Such a conclusion makes sense: the application of the rebuttal dem-

³²⁸ Network effects on the Internet, of course, will not be limited to auctions. Messaging services, chat rooms, and dating services are but a few other obvious examples. See Evans, *supra* note 238, at 51 (discussing the network effects present in various Internet markets).

³²⁹ Many such business methods have already been developed on the Internet in remarkably short periods of time.

³³⁰ The rebuttal also would apply in the semiconductor and automobile industries (in which time to market is important, patents are not necessary to create the product, and invention takes place in a cumulative fashion) and in the computer software industry (in which the same factors exist in addition to the presence of a network effects market).

onstrates that competition contributes to innovation in the industry, and the surrebuttal focuses on the ultimate question of whether the market is in fact characterized by innovation. In this case, it seems likely that the Internet markets are characterized by innovation, thus allowing the Internet Auctioneer monopolist to utilize the surrebuttal to escape liability under Section 2 of the Sherman Act.

* * *

A comparison of the results of the proposed test with the four representative cases discussed earlier in the Article³³¹ demonstrates the promise of the new approach. Take CureFinder, the biopharmaceutical patentee. One court would uphold the company's refusal to license because it was within the scope of the patent (*Xerox*); two courts would punish it on the grounds that it was predatory (*Microsoft*) or denied an essential facility (*Intel* district court); and one court's conclusion would depend on the company's intent (*Kodak II*).³³² None of these tests even attempts to ascertain the net result of the conduct on innovation or welfare. The approach proposed in this Article eschews such formalism and tailors its analysis to the industry at issue. The test also is grounded in the reality of market conditions. Even in industries in which competition is the catalyst for innovation, a Section 2 violation can be found only after the market is examined and found to be lacking in innovation. Application of the test would lead to the conclusion that, because of the crucial role patents play in attaining innovation in the biopharmaceutical industry, the rebuttal is not satisfied, and CureFinder does not violate Section 2.³³³

³³¹ *Supra* Part I.B.

³³² For a discussion of the extrapolation of courts' approaches to new factual settings, see *supra* note 50, cautioning against applying a test developed in the context of a particular fact pattern to a new scenario.

³³³ The approach also solves some of the difficulties presented by Kaplow's "ratio" test, discussed *supra* Part I.C.6. First, courts will be more likely to apply the approach, whose primary focus lies on the level of industry, not of particular licensing agreements. For many of these industries, respected studies have demonstrated the roles played by patents and competition in attaining innovation. See *infra* note 340 (noting five such studies).

Second, the approach solves some interdependency problems by moving the debate from the common denominator of social welfare to that of innovation. Innovation is not subject to the same synergistic relationship among each of its manifestations. For example, a court decision affecting a monopolist's patent-based activity in the pharmaceutical industry will not automatically affect innovation in the automobile industry, particularly if the decision is grounded in conceptions of how innovation is achieved in the pharmaceutical industry. Even if there is some relationship among

industries, innovation can reside in a more multidimensional construct than can the single calculation of social welfare. At the same time, innovation benefits from being the most important factor in achieving economic growth. *See supra* notes 233-37 and accompanying text (discussing economic studies that have revealed a powerful link between innovation and economic growth). Therefore, even if it is a narrower common denominator, innovation still contributes substantially to the broader social welfare.

Shifting the common denominator might not completely solve the feedback loop between patent-antitrust doctrine and the optimal patent life (or lives). Each application of the test offered by this Article could have some effect on the optimal patent life. But this effect is likely to be more theoretical than practical. In those industries that are most affected (those in which patents are not critical to competition), any weakening of the patent grant is not likely to have a significant effect on innovation. So even if, in theory, a patent life in a competition-based industry (assuming, for the moment, more than one optimal patent life) would need to be extended to compensate for the narrowing of patent breadth, this extension (from, say, twenty years to twenty-two years) would be beside the point when market-based incentives have altered the market dramatically by year twenty, rendering the patent largely irrelevant as a practical matter.

Finally, the proposed test aims to increase invention, not just patentee reward. By moving from the level of the individual agreement to that of the relevant industry, the relationship between patentee reward and inventive activity finally can be ascertained. Empirical industry-based studies of the link will replace individualized determinations of the motivations of individual patentees. The analysis thus will not bog down in issues such as the importance for each patentee of the patent in achieving innovation, or the patentee's repeat involvement in the inventive process and familiarity with antitrust restraints. Rather, inquiry will focus on factors determining the need for patents in particular industries, such as a product's difficulty of creation and ease of imitation, and the presence of market-based incentives to innovate. These industry-specific determinations inform Kaplow's observation, on the *individual* level, that "inventors' decisions to undertake inventive activity are based on their perceptions of potential rewards before they undertake the activity." Kaplow, *supra* note 1, at 1838 (emphasis omitted). The difference between Kaplow's approach and the approach presented in this Article is that the link between patentee reward and inventive activity can be unearthed only when we leave the level of the individual practice and move to the level of industry. The benefit of forging the link is that the goal to be maximized becomes invention rather than reward to patentees—a distinction that matters most in industries in which patents are not critical to innovation. In these situations, application of this Article's test likely would lead to a different result than that provided by the Kaplow test.

Matched up against the Kaplow ratio test, most factors in the industry-specific approach offered by this Article would fall into an expansive version of the numerator in their focus on inventive activity. The *ex ante* factors, for example, in analyzing the role of patents in achieving innovation, could be placed there. The *ex post* factor, in recommending a stronger role for competition in industries in which innovation is cumulative, could be treated as a variant of the denominator in its focus on monopoly loss: a patent in an industry with cumulative innovation will, *ceteris paribus*, result in greater monopoly loss than a patent in an industry with discrete innovation. So, extrapolating the *ex ante* and *ex post* factors to this construct, a stronger role for antitrust would be envisioned in industries in which the numerator was small (because patents are not necessary for innovation) and the denominator was large (because innovation is cumulative). But again, the proposed test aims to be practically applicable, as it does not

IV. COUNTERING THE OBJECTIONS

The test elaborated in Part III offers a new approach to the paradox presented by the intersection of the patent and antitrust laws. But it is more than a modest proposal. Three objections can be anticipated: (1) the test is too complicated for courts to apply, (2) it reduces the incentives underlying the patent system, and (3) similar results could be achieved merely by adjusting the patent system. The next three Sections address these potential criticisms.

A. *Application of the Test*

The first objection is that courts cannot apply the proposed test—it is too complicated, and courts cannot determine how innovation is achieved in various industries. This Section demonstrates that, to the contrary, courts can apply the test, and assistance from the government antitrust enforcement agencies would provide even more support for the courts' position.

1. The Rebuttable Presumption

As a matter of form, a rebuttable presumption is a particularly useful tool by which courts can structure their analysis, as it promises a middle ground between amorphous open-ended standards and inflexible bright-line rules.³³⁴ Jurisprudence under Section 1³³⁵ of the Sherman Act provides examples of these two extremes. On the one hand is the kitchen-sink approach of the Rule of Reason, by which courts consider multiple factors in deciding whether restraints between competitors are “unreasonable.” On the other is per se condemnation, which leads to blanket condemnation of activities like price fixing and market allocation agreements. In between per se and Rule-of-Reason analysis are presumptions. Presumptions provide default positions that give shape to, but do not hamstring, the analysis. Presumptions promise certainty for parties, increased predictability,

require the calculation of ratios, but rather pinpoints observable inputs in the innovation process and orders them in a rebuttable presumption.

³³⁴ See Areeda, *supra* note 234, at 42 (“Carefully formulated presumptions to implement open-ended legal rules can approach the clarity of bright line rules without sacrificing flexible responsiveness to the peculiarities of the particular case.”).

³³⁵ Like analysis under Section 2, Section 1 interpretation resembles common law analysis. The law develops case by case, with no assistance from the statutory language. See *supra* notes 202-04 and accompanying text (noting that the vague language of Sections 1 and 2 of the Sherman Act does not illuminate the Act's objectives).

and the reduction of error costs.

Presumptions, of course, are only as effective as their component parts. Here, courts can apply each of the three stages of the proposed test. The presumption requires only that courts determine whether the practice makes economic sense solely by injuring competitors. It is similar to the “business justification” analysis that antitrust courts today employ under Section 2.³³⁶ Courts need not explore subjective intentions; rather, they just need to determine the likely effect of the conduct. Similarly, courts can apply the surrebuttal. Although innovation may be slightly less measurable than price or output, its presence or absence typically will be apparent, as courts that have examined the issue have demonstrated.³³⁷ Moreover, courts need not compare the level of innovation in the market to a particular threshold; its presence alone is sufficient.³³⁸

The most challenging stage for courts to apply will be the rebuttal.³³⁹ Determining the relative roles of patents and competition in

³³⁶ See *supra* note 245 (describing this analysis).

³³⁷ See *supra* notes 226-31 and accompanying text (citing illustrative decisions).

³³⁸ Courts also can filter out inauthentic “innovation” that results in no improvements in the market.

³³⁹ A prerequisite to the application of the rebuttal involves the definition and boundaries of particular industries. Denoting the industry as the unit of analysis assumes that various types of firms within the industry achieve innovation in a similar manner. To the extent that this is not true and that certain firms, for example, in the biotechnology “industry” rely more on competition than patents, the relevant unit of analysis must contract to embrace a subset of the industry for which consistent innovation-specific conclusions can be drawn. In that case, further study of the “industry” is called for. But in most cases, this should not present difficulties. Most companies fall into obvious, discrete industries in which broad conclusions about attaining innovation can be drawn—personal computer manufacturers, commercial aircraft, automobiles, and pharmaceutical companies, to name but a few. Moreover, the fact that the relative contributions to innovation in a particular industry may evolve over a period of time does not deny that the typical industry will not experience such radical and overnight change. (If it does, then parties should be able to demonstrate that previous studies of the industry are less persuasive.) Finally, it is worth remembering that courts will not be creating a genus-species taxonomy chart for which the relationship between every industry needs to be sketched precisely; they will only be addressing particular (typically repeat) industries in which a company has an overwhelming share of the market and a Section 2 claim has been filed on account of the company’s patent-based activity.

Nor should the application of the test to new industries be a cause for concern. Even if, for these industries, courts cannot rely on economic studies that will prove helpful in other industries, the application of most of the *ex ante* and *ex post* factors should be straightforward. By the time the court considers a challenged patent-based practice, it will be able to determine the presence or absence of market-based incentives to innovate in the industry and the ease of creation, and difficulty of imitation, of the product or process. The only factor that might prove challenging is the cumulative nature of innovation in a fledging industry that is still in the first generation of a pat-

particular industries could, in theory, call for exhaustive proceedings and the comparative evaluations of experts. But courts need not attempt to tackle matters on their own. In particular, several well-respected studies by economists examining how innovation is achieved in various industries should prove a constructive starting point.³⁴⁰ For many industries covered by these studies, the conclusions can be adopted automatically by courts, absent any showing that they are dated or not applicable in a particular case. For example, the studies demonstrate that industry executives consider patent protection important in a handful of industries, such as chemicals, pharmaceuticals, and biotechnology,³⁴¹ and that they consider the benefits of competition to be vital in most other industries.³⁴² Therefore, courts can readily dismiss arguments by patentee monopolists that patents are critical in industries such as, for example, computer software or the Internet, or arguments by plaintiffs that competition is the primary incentive for innovation in the pharmaceutical or chemicals industries. Although new studies—particularly of industries not previously examined—are necessary and should be undertaken, the studies already completed should prove of significant assistance to courts.³⁴³

ented product. In that case, the ex ante factors will be vital, supplemented by an educated guess and reasoning by analogy to similar industries on the ex post perspective.

³⁴⁰ E.g., COHEN ET AL., *supra* note 265; F.M. SCHERER ET AL., PATENTS AND THE CORPORATION (2d ed. 1959); TAYLOR & SILBERSTON, *supra* note 175; Levin et al., *supra* note 282; Mansfield, *supra* note 278.

³⁴¹ For a discussion of the evolving and nonhomogeneous nature of the biotechnology industry (which could entail further subdivision), see *supra* note 278.

³⁴² Of course, even well-intentioned executives might be mistaken in their beliefs. But the overlap between executive beliefs and measurable determinants from industries (such as the difficulty of creation and ease of imitation) assuages some of these concerns.

³⁴³ The methodology and authors of any new studies should reveal if the works are not entitled to deference on account of being, for example, funded by particular industries. The Levin and Cohen studies provide examples of studies to be emulated. The Levin study surveyed high-level R&D executives on the effectiveness of patents, alternative means of appropriation, and the cost of imitating rivals' innovations; it compiled the responses of 650 executives in 130 industries to a questionnaire that was based on literature concerning technological change, the economic impact of the patent system, scholarly work on imitation costs, and case studies. Levin et al., *supra* note 282, at 785, 789-90. The Cohen study surveyed 1478 R&D laboratories in the manufacturing sector to determine the percentage of innovations for which various appropriability mechanisms were effective. COHEN ET AL., *supra* note 265, at 35. The Cohen study also sought to determine why firms patented inventions. See *id.* at 16-24 (analyzing reasons for patenting such as preventing copying, preventing other firms' attempts to patent related inventions, earning licensing revenue, strengthening the firm's position in negotiations with other firms, preventing infringement suits, measuring internal performance of a firm's technology workers, and enhancing the firm's reputation).

Even the testimony of dueling experts on the issue of how innovation is achieved in particular industries will be received subject to the backdrops of the economists' studies and measurable objective factors such as the cost of invention and the presence of network effects.³⁴⁴

Each of the factors in the *ex ante* and *ex post* perspectives could, in certain cases, be resolved by the court at summary judgment or on motion for a directed verdict.³⁴⁵ For example, the court could readily determine the application of the rebuttal in industries such as pharmaceuticals, chemicals, the Internet, computer software, semiconductors, and automobiles. Moreover, even juries could apply the factors of the rebuttal. The issues of market-based incentives to innovate, ease of creating and difficulty of imitating products, and cumulateness of innovation are narrower and more focused (and certainly not more difficult to apply) than other tasks with which juries have been charged, such as balancing the anticompetitive and procompetitive effects of agreements between competitors, delineating the boundaries of markets, and determining whether a monopolist's action is "exclusionary." Moreover, the jury's conclusion on each of the *ex ante* and *ex post* factors of the rebuttal can be checked (and even reversed) through the use of special verdicts or general verdicts with interrogatories.³⁴⁶

In short, the rebuttable presumption offered by this Article acknowledges the nuances of the intersection that preclude inflexible bright-line rules, and it recognizes the need for direction so often lacking in indeterminate open-ended standards. Furthermore, the rebuttable presumption is consistent with the types of tasks that courts and juries have undertaken, and it builds on respected economic studies that already have examined how innovation is achieved in various industries. The antitrust government enforcement agencies can provide yet additional assistance in this endeavor.

2. Antitrust Government Enforcement Agencies

Because of the complexity of the issues, assistance from the anti-

³⁴⁴ In applying the rebuttal, courts should focus not on the parties before the court but on the characteristics of the relevant industries.

³⁴⁵ The court also could resolve the presumption and surrebuttal inquiries at these stages in many cases. Courts, as opposed to juries, will decide the outcome of a case when the parties waive their right to a jury trial or when the government brings a case seeking only equitable relief. 2 AREEDA ET AL., *supra* note 2, ¶ 306(d), at 62.

³⁴⁶ See FED. R. CIV. P. 49 (authorizing the use of special verdicts and general verdicts accompanied by answers to interrogatories).

trust government enforcement agencies would be helpful. Nearly all of the staff of the Federal Trade Commission and the Antitrust Division of the U.S. Department of Justice possess antitrust experience, and some (such as those in a section of the agency devoted to intellectual property) also have patent expertise. Economists, researchers, and other professionals join lawyers at the agencies, and all are well-suited to undertake broad analyses of industries.³⁴⁷ The agencies also can call on a wide range of experience outside the government—as the FTC did in its 1996 hearings on global-based competition³⁴⁸—and in fellow agencies.³⁴⁹ The FTC’s 2002 hearings on “Competition and Intellectual Property Law and Policy in the Knowledge-Based Economy” promise to shed additional light on the subject in focusing on “the implications of antitrust and patent law and policy for innovation and other aspects of consumer welfare.”³⁵⁰

The issuance of guidelines would be the most helpful act that the agencies could undertake.³⁵¹ Guidelines take a comprehensive approach to a particular area of law, contain supporting theory, and are

³⁴⁷ See 2 AREEDA ET AL., *supra* note 2, ¶ 302(h)(5), at 25 (arguing that the FTC can probe an industry with more depth than can the courts).

³⁴⁸ Witnesses at the hearings included academics from a broad range of institutions and representatives from the U.S. Chamber of Commerce, American Intellectual Property Law Association, American Pharmaceutical Association, AOL, AT&T, Citicorp, Coca-Cola, GE, Hewlett-Packard, IBM, Kodak, Lockheed Martin, Novell, Pfizer, Sun, Texas Instruments, U.S. West, and Disney. FTC REPORT, *supra* note 256, app. A. The chance that the FTC (or the Antitrust Division) would suffer from “capture” by affected companies would appear to be less than that at other federal agencies. The antitrust agencies each regulate at least half of the economy—they typically divide the industries for which they are responsible—in contrast to most agencies, which regulate a single industry. Spencer Weber Waller, *Prosecution by Regulation: The Changing Nature of Antitrust Enforcement*, 77 OR. L. REV. 1383, 1428 (1998). The final report on global competition issued by the FTC (as well as, for example, the Intellectual Property Guidelines) reveal the agencies’ professional nature and the lack of any apparent capture. See generally FTC REPORT, *supra* note 256; INTELLECTUAL PROPERTY GUIDELINES, *supra* note 16.

³⁴⁹ For example, the FTC has turned to the National Institutes of Health for biotechnology issues, the Federal Communications Commission for communications expertise, and the Food and Drug Administration for help on pharmaceutical mergers. Robert Pitofsky, *Antitrust and Intellectual Property: Unresolved Issues at the Heart of the New Economy*, 16 BERKELEY TECH. L.J. 535, 558 (2001).

³⁵⁰ Notice of Public Hearings and Opportunity for Comment, Federal Trade Commission, at <http://www.ftc.gov/os/2001/11/ciphearingsfrn.htm> (Nov. 15, 2001).

³⁵¹ Such guidelines would not be a one-shot promulgation. Rather, they would evolve as the agencies continue to amass experience with the issue of industry-specific innovation. The FTC’s hearings on global-based competition provide a strong starting point, as they include testimony from the business community on how innovation is achieved in various industries.

not bound by the facts of any particular case. These features allow the agencies to take more expansive approaches than courts.³⁵² Guidelines also provide the framework that the agencies will use in deciding whether to challenge a practice.³⁵³

Moreover, there is precedent for guidelines. In the past decade alone, the agencies have issued Horizontal Merger Guidelines,³⁵⁴ International Guidelines,³⁵⁵ Intellectual Property Guidelines,³⁵⁶ and Guidelines for Collaborations Among Competitors.³⁵⁷ Of particular significance here are the 1995 Intellectual Property Guidelines developed jointly by the Justice Department and the FTC. These guidelines offer an overview of the conflict between the antitrust and the intellectual property laws, reasonable presumptions with which to analyze the intersection of the two areas of law, and illustrative examples of the treatment of patent licensing transactions. Courts have shown increasing respect for (or, at a minimum, awareness of) guidelines as standards of evaluation upon which they can rely. For example, the various Merger Guidelines have been cited in more than 100 federal antitrust cases, and the International and Health Care Guidelines also have been cited extensively.³⁵⁸ Adoption of guidelines concerning the relative roles played by patents and competition in achieving innovation in various industries would supplement the studies that have been undertaken by economists and would provide additional assistance to courts.

3. Role of the Courts Under Section 2

The new test will not require amendment of the Sherman Act. It is consistent with the statute's amorphous text and indeterminate legislative history, and with the primary role that courts have played in

³⁵² See Daniel J. Gifford, *The Jurisprudence of Antitrust*, 48 SMU L. REV. 1677, 1698, 1709 (1995) (contending that the persuasive power of guidelines exceeds that of most reasoned judicial decisions because the judicial format is not well adapted to generalized policy analysis).

³⁵³ Waller, *supra* note 348, at 1405. Because the decision of the government to challenge an action is so important, "[t]he guidelines . . . enjoy considerably greater stature than the case law itself." *Id.* at 1404.

³⁵⁴ U.S. DEP'T OF JUSTICE & FED. TRADE COMM'N, HORIZONTAL MERGER GUIDELINES (1992).

³⁵⁵ U.S. DEP'T OF JUSTICE & FED. TRADE COMM'N, ANTITRUST ENFORCEMENT GUIDELINES FOR INTERNATIONAL OPERATIONS (1995).

³⁵⁶ INTELLECTUAL PROPERTY GUIDELINES, *supra* note 16.

³⁵⁷ GUIDELINES FOR COLLABORATIONS, *supra* note 232.

³⁵⁸ Waller, *supra* note 348, at 1405-06.

the development of antitrust jurisprudence.

As discussed above, the Sherman Act is an open-ended statute.³⁵⁹ Adopting a new innovation-increasing, industry-specific approach is at least as consistent with the statute and the legislative history as other approaches that have predominated—from immunity for patentholders, to essential facilities, to presumptions rebuttable on the grounds of pretext.³⁶⁰ And, again, courts have played by far the most significant role in developing antitrust jurisprudence.³⁶¹ Such a role has witnessed many shifts and reversals of Section 2 analysis. *Even now*, after more than a century of interpreting Section 2, courts apply many different approaches—as revealed by the *Xerox*, *Kodak II*, *Intel*, and *Microsoft* cases³⁶²—to claims involving intellectual property. None of these approaches required a change in the statute. In fact, none of the disparate goals motivating antitrust analysis in the past century (and often changing generation by generation) were accompanied by changes in the statute.

To the extent courts focus on innovation, they are merely selecting a type of efficiency that they already have recognized (especially recently) as an important goal of the Sherman Act, and that Congress, in related contexts, has acknowledged is essential to the competitiveness of the U.S. economy.³⁶³ And to the extent this test displaces other approaches, it promises greater predictability and certainty as to how courts will treat monopolists' patent-based activity.

³⁵⁹ *Supra* Part II.B.2.a.

³⁶⁰ There is always the risk that certain industries will lobby Congress for legislation declaring the patent-centered nature of innovation in their industry. The legislature should tread carefully before offering such *sui generis* protection, and courts should analyze any such legislation realistically, considering it to be more closely aligned with industry-sponsored studies than objective surveys.

³⁶¹ *See supra* text accompanying notes 214-23 (outlining the role of courts in the evolution of antitrust law).

³⁶² *See supra* Part I.B (describing and analyzing the approaches used by the courts in the four cases).

³⁶³ *See* 35 U.S.C. § 271(d)(4)-(5) (1994) (stating that the refusal to license a patented product and the tying of a patented product for which the inventor lacks market power to a second product do not constitute patent misuse); National Cooperative Production Amendments of 1993, Pub. L. No. 103-42, § 2, 107 Stat. 117, 117 (“It is the purpose of this Act to promote innovation, facilitate trade, and strengthen the competitiveness of the United States in world markets . . .”); National Cooperative Research Act of 1984, Pub. L. No. 98-462, 98 Stat. 1815, 1815-16 (intending to “promote research and development, encourage innovation, stimulate trade, and make necessary and appropriate modifications in the operation of the antitrust laws” by requiring courts to conduct an inquiry into the reasonableness of the conduct of persons involved in research and development joint ventures, rather than deeming their conduct *per se* illegal).

B. *Reduction of Patent Incentives*

The second anticipated objection to the proposal is that it weakens the incentives underlying the patent system. Congress enacted the patent system, so the argument goes, to promote invention and innovation, and any weakening of patents—through, for example, a finding that a patent-based action violates Section 2—will diminish the incentives that support the system.³⁶⁴ Admittedly, the proposed test could lead to a marginal reduction in the breadth of patents. But (1) the magnitude of any such reduction would be small, and (2) there *must* be some minimal reduction if any role at all is to be accorded to antitrust in achieving innovation.

First, any reduction in patent-based incentives will be minor. The patent itself will still be valid. The patentee can continue to enforce the patent for the remainder of the twenty-year period against infringers, can control the manner in which the patent is used, and can license the patent.³⁶⁵ And even the imposition of remedies like compulsory licensing typically still allows the patentee to recover the costs of invention, and probably would not limit innovation.³⁶⁶ Moreover,

³⁶⁴ Courts can apply the antitrust laws even if other statutes are thereby implicated. For example, ever since the enactment of the Sherman Act, courts have considered the validity of patent, copyright, and labor issues under the antitrust laws. *See supra* Part I.B (discussing federal cases in which the courts consider the relationship between the antitrust laws, on the one hand, and the patent and copyright laws, on the other); *see also* *Connell Constr. Co. v. Plumbers & Steamfitters Local Union No. 100*, 421 U.S. 616, 622 (1975) (noting that some union-employer agreements should be granted a limited non-statutory exemption from antitrust sanctions); *Local Union No. 189, Amalgamated Meat Cutters v. Jewel Tea Co.*, 381 U.S. 676, 689 (1965) (“[E]xemption for union-employer agreements is very much a matter of accommodating the coverage of the Sherman Act to the policy of the labor laws.”). Congress’s intention that courts play such an expansive role in interpreting antitrust law assuages any concern that courts encroach on the province of the legislature in considering the applicability of other areas of law. *See supra* Part II.B.2.a (outlining the legislative history of the Sherman Act); *cf.* Kaplow, *supra* note 1, at 1818-20 (rejecting the argument that antitrust law should yield to other overlapping statutes).

³⁶⁵ For a discussion of potential remedies that courts might consider upon finding a Section 2 violation, *see supra* note 249.

³⁶⁶ Compulsory licensing was a frequently applied remedy in the 1940s and 1950s, with 107 antitrust settlements between 1941 and 1959 calling for such licensing or dedication of between 40,000 and 50,000 patents. Scherer, *supra* note 234, at 1017. In 1956 alone, IBM and AT&T were required to license more than 9,000 patents, many royalty-free. *Id.* In the following decade, company-financed R&D industrial expenditures grew substantially. *Id.* Studies from the era (and later) demonstrated that “actual or feared compulsory licensing had very little impact” on corporations’ investments in new technology. *Id.* at 1018; *see also* Levin et al., *supra* note 282, at 804 (reporting that R&D executives “rarely judge[]” compulsory licensing to be “a significant limit on the effectiveness of patents”).

the test will apply *only to monopolists*—those with at least a sixty to seventy percent market share in a relevant antitrust market with barriers to entry. Many patentees, of course, will never be subject to Section 2 because, even though they have the power to prevent others from making, using, or selling the patented product or process, they lack the power to exercise control over a market of goods or services that includes the patented product. Finally, even patentee monopolists will be penalized *only if*: (1) their actions make sense only by injuring competitors, or (2) they operate in competition-based industries that lack innovation.³⁶⁷

More fundamentally, antitrust cannot contribute to innovation if every indirect manifestation of a reward of the patent system is, as a matter of principle, off limits. This would lead us back to a test based on the scope of the patent, which fails to recognize that, in some industries, certain exclusive activity within the scope of the patent leads to a smaller increase in innovation than would competition.³⁶⁸ So in order to carve out any type of role for competition in industries in which competition, and not patents, is critical for innovation, and in markets in which patentees exercise monopoly power, the incentives underlying the patent system can be marginally reduced.³⁶⁹ Again, this is not a significant concern: if the objective of the patent system is to promote invention and innovation, and there is strong evidence that innovation is achieved in a particular industry substantially more from competition than from patents, then there should be no quarrel with limiting (at most) a small amount of patent-motivated innovation to open the floodgates to a potential torrent of competition-induced innovation.

³⁶⁷ Of course, a patentee may not know *ex ante* if, upon the ultimate development of the product, it will be a monopolist in a particular, to-be-defined market. The test thus conceivably might have a chilling effect on innovation in instances in which patentees refrain from innovating because of fear of antitrust liability but ultimately would not have become monopolists or would have escaped a Section 2 violation by operating in a patent-centered industry or an industry marked by innovation. Such a consequence, however, is the inevitable result of according antitrust a meaningful role to play in achieving innovation in industries that utilize patents.

³⁶⁸ See *supra* Part I.C.1 (discussing a proposed solution to the patent-antitrust conflict based on the scope of a patent).

³⁶⁹ Even if the plaintiff has not yet benefited from competition-based incentives (e.g., it did not arrive in the market first), such incentives do not disappear after the initial invention. The application of Section 2, then, particularly in industries with cumulative innovation, would tend to keep alive these incentives.

C. *Readjustments to the Patent System*

The final anticipated objection would question the need to haul out the heavy artillery of antitrust and Section 2 of the Sherman Act when many of the benefits could be achieved merely through readjustments to the patent system. Certainly, one conceivable response to the concern that different industries rely in varying levels on patents for innovation may be to calibrate the patent reward accordingly. If patents are not critical in an industry, then less patent protection might make sense. One problem with such an approach is that it is impossible to know the exact parameters of the patent grant that would maximize—or at least substantially increase—innovation. In industries in which patents are less critical, should the breadth of the grant be narrowed? Should the twenty-year right to exclude be reduced to ten years? Five? Two? Zero? It is impossible to answer such questions precisely.³⁷⁰ In fact, it is difficult to determine the overall net effect of the patent system on innovation and welfare today.³⁷¹

³⁷⁰ See *supra* note 117 (outlining the difficulties of determining the precise form of patent system that would maximize innovation); see also Baxter, *supra* note 1, at 271-72 (discussing the optimal term length for patents and noting that “given the existing state of the economic art, we cannot say how much subsidy is optimal”); Kaplow, *supra* note 1, at 1824 (“[O]ur knowledge of the functional relationships . . . connecting patent life to social benefits remains quite limited.”); Machlup, *supra* note 117, at 9-10 (noting that the reason for the length of patent terms “is probably more political than economic” and that “many patent attorneys and few economists” have testified before the legislature when it considers patent terms).

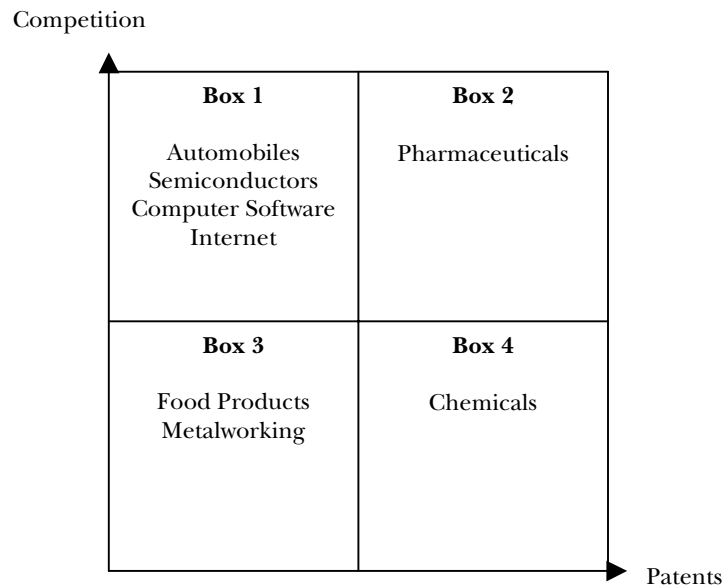
Another example of tinkering with the patent system might arise based on the ex post effect of cumulative innovation. All we would need to do in industries characterized by such innovation, some might argue, is to calibrate the incentives supporting initial and follow-on invention to maximize innovation. The more that innovation in the industry is cumulative, the greater the incentive for follow-on innovation (and so, perhaps, the shorter or narrower the initial patent grant should be). This is subject to similar difficulties of measurement as the problem posed in the text: it is impractical to divine precise characteristics of a patent grant that could structure the relationship between initial and follow-on invention so as to maximize innovation. Moreover, the “problem” of cumulative innovation matters most in industries in which competition is critical to achieve innovation—where parties will compete to improve the product. So the proposed test does not concern itself with the problem of cumulative innovation in industries in which competition is not important for innovation. And where competition is important, we need not draw difficult divisions of reward between initial and follow-on invention; rather, we just need to recognize a role for competition.

³⁷¹ Several commentators have sharply criticized the existing patent system. According to one:

No economist, on the basis of present knowledge, could possibly state with certainty that the patent system, as it now operates, confers a net benefit or a net loss upon society. The best he can do is to state assumptions and make guesses about the extent to which reality corresponds to these assumptions.”

achieving innovation cannot consider the role of competition.³⁷⁴ So the recalibration could not distinguish, for example, two industries in which patents are not important to innovation—one in which competition is important (e.g., computer software) and one in which it is not (e.g., food products). The patent recalibration, then, fails to recognize the more important role played by the antitrust laws in fostering competition-induced innovation in industries like the computer software industry. The proposed test, in contrast, recognizes that the roles played by competition and patents are independent and that there are two axes to innovation. Figure 2 demonstrates the advantages of the two-axis approach over the single-axis recalibration presented in Figure 1.

Figure 2: Criteria in Proposed Test: Importance of Patents and Competition to Innovation in Various Industries



The above figure illustrates the roles played by patents and com-

³⁷⁴ Any contention that the inverse of the finding on patents equals the finding for competition (that is, competition is not important when patents are, and vice versa) is not persuasive since there is no reason why the contributions of patents and competition to innovation need to be mutually exclusive. For example, the fact that patents are critical in the pharmaceutical industry tells us nothing about the importance of competition in attaining innovation in the industry.

petition in innovation.³⁷⁵ The greater the magnitudes of the inputs³⁷⁶ (and further out the x- and y-axes), the more critical they are to innovation.³⁷⁷ So the proposed test would defer to patents, by not applying the rebuttal, in Boxes 2 and 4. In Box 4 (e.g., chemicals), deference is mandated since patents are important and competition is not. And in Box 2 (e.g., pharmaceuticals), even though competition is important, courts should defer to patents so as not to interfere with the incentives underlying the patent system (which are important in Box 2) and to minimize error costs.³⁷⁸

In Box 3 (e.g., food products, metalworking), the presumption also would carry the day: even though patents are not critical to innovation, competition is not important either, so it would not be productive to apply Section 2. Only in Box 1 (e.g., automobiles, semiconductors, computer software, Internet) would the presumption be rebutted, since innovation is achieved through competition and not through patents.

The one-axis calculation implicit in the readjustment of the patent laws misses the complexity and independence of the dual paths to innovation.

CONCLUSION

This Article proposes a new approach to reconcile the patent and antitrust laws. The centerpiece of this approach is an industry-specific analysis of innovation. Such a focus has several benefits.

First, it offers a common denominator. Innovation is the goal of the patent system and a critical objective of the antitrust laws. By endeavoring to increase innovation, the proposed test promises to take advantage of both the patent system and competition in those instances in which they have the most to contribute to innovation. The common denominator also offers courts an alternative to formalistic

³⁷⁵ See *supra* Part III.B for a discussion of the industries in the Figure. Again, placement of industries in particular boxes in Figure 2 should be viewed as an initial effort, subject to revision as additional studies reveal new detail concerning how innovation is achieved in particular industries.

³⁷⁶ The inputs are determined by considering both ex ante and ex post perspectives.

³⁷⁷ A precise spot on the axes, of course, need not be marked. Ballpark spots (or at least placement in one of the four boxes depicted) can be ascertained and the roles of patents and competition can be assessed independently.

³⁷⁸ See *supra* notes 307-11 and accompanying text (explaining that ambiguity in applying the factors should be resolved against a finding of Section 2 liability).

and incomplete tests based on the scope of the patent, the intent of the defendant, and the number of markets involved.

Second, it engages analysis at a productive, heretofore unexplored, level: the level of industry. Commentators have offered approaches that simultaneously (1) argue from global understandings about the patent and antitrust systems and (2) apply on the narrow level of particular agreements. Such analyses neglect variations among industries and quickly bog down in impracticability.

The proposed rebuttable presumption offers a middle approach. It recognizes that the patent and antitrust systems are not monolithic and that innovation takes place through different paths in different industries. Patents, for example, are critical for innovation in the chemicals and pharmaceutical industries. Competition is essential in industries in which network effects are significant, such as Internet business methods and computer software. The approach recognizes and orders the essential building blocks of the intersection that have until now been overlooked: the presence of market-based incentives to innovate, the ease of creating products, the difficulty of imitating products, and the cumulative path of innovation. At the same time, the test avoids severe administrability problems by not focusing exclusively on the level of particular practices, and it forges the otherwise impenetrable link between patentee reward and inventive activity.

Courts and commentators have struggled, unsuccessfully, with the patent-antitrust paradox for generations. The rebuttable presumption proposed by this Article offers a new tool with which courts can tackle the intersection. In acknowledging the incentives underlying the patent system while simultaneously preserving a role for the antitrust laws, the test marshals the unique contributions of both systems in the attempt to increase innovation.