

PATENTS AND ANTITRUST: APPLICATION TO ADJACENT MARKETS

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INTRODUCTION

Patents are a key aspect of intellectual property protection created to ensure sufficient incentives for innovative activity. A patent gives its owner the right to exclude others from practicing the claimed invention for a defined term of years. This right is conferred as a reward for inventive activity and the inventor's disclosure of how to make and use the invention.¹ In contrast, antitrust law attempts to protect consumers by prohibiting business conduct involving the abuse of market and monopoly power such as exclusionary actions and conspiracies to limit competition. Thus, at a first glance, there appears to be a significant conflict in how patent and antitrust laws regard exclusion of competitors.

In this Article, we assume that the goal of United States antitrust laws is to promote productive, allocative, and dynamic efficiency.²

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1. The patent law's enabling disclosure requirement benefits society in two ways. First, the inventor's know-how is shared with society upon publication of the patent application and may be practiced by others immediately upon expiration of the patent. Second, the disclosure results in innovative new products or improvements to the invention; other inventors have incentives to design around the patent, or create patentable improvements upon the disclosed invention. The patent system differs from trade secret law, although both regimes encourage invention. See *Kewanee Oil Co. v. Bicron Corp.*, 416 U.S. 470, 481 (1974). Using trade secret law, a party protects its competitive advantage by legally excluding others from using information it properly maintains as a proprietary secret by making reasonable efforts to establish and maintain its confidentiality. Trade secret protection is indefinite, lasting until another party obtains the information in a proper manner, such as intentional or accidental disclosure by the owner, independent invention, or discovery through reverse engineering. The most famous example is the formula for Coca-Cola, which has been kept secret and provided significant commercial benefits to its owner for over a century. See, e.g., *Coca-Cola Bottling Co. of Shreveport, v. Coca-Cola Co.*, 107 F.R.D. 288, 289 (D. Del. 1985).

2. Economists measure the benefit of alternative market structures in terms of societal

Productive efficiency means costs of creating goods are minimized. Allocative efficiency means that market prices for these goods are close to the incremental production costs. Dynamic efficiency means that the appropriate amount of innovation occurs for both creating new products and reducing costs of existing ones. Competition in a market economy creates, preserves, and enhances all three types of efficiency. Antitrust law safeguards the business environment so that this competition can flourish.

Patent law is an example of how public policy departs from relying on competition as the means of achieving efficiency.³ Patent grants establish legal monopolies with limited time durations. Competition in a market of a patented product is given up in the hope that monopoly profits guaranteed by patent protection in the short run will provide the appropriate incentive to engage in innovative activity. Departure from competition implies a loss of allocative and possibly productive efficiency.⁴ At least in theory, the grant of a patent trades a reduction in

satisfaction or total surplus ("TS"), which is the sum of consumers' surplus ("CS") (defined as the net satisfaction of consumers from the operation of a market) and producers' profits or producers' surplus ("PS"). Economists disagree on whether the aim of antitrust law should be to protect consumers' surplus or to protect total surplus from anti-competitive actions. Maximization of productive, allocative, and dynamic efficiency also maximizes total surplus. For a discussion of what should be the objective of antitrust law, see Louis Kaplow & Carl Shapiro, *Antitrust*, in 2 HANDBOOK OF LAW AND ECONOMICS 1073, 1226 (A. Mitchell Polinsky & Steven Shavell eds., 2007); Dennis W. Carlton & Randal C. Picker, *Antitrust and Regulation* (Univ. of Chicago Law & Econ., Olin Working Paper No. 312, 2006), available at <http://ssrn.com/abstract=937020>; Joseph Farrell & Michael Katz, *The Economics of Welfare Standards in Antitrust*, COMPETITION POLY CENTER (Inst. of Bus. & Econ. Research, Berkeley, Cal.), July 20, 2006, available at <http://repositories.cdlib.org/cgi/viewcontent.cgi?article=1061&context=iber/cpc>; Richard Gilbert, *Holding Innovation to an Antitrust Standard*, COMPETITION POLY CENTER (Inst. of Bus. & Econ. Research, Berkeley, Cal.), Spring 2007, available at http://works.bepress.com/cgi/viewcontent.cgi?article=1016&context=richard_gilbert.

3. Other examples of when public policy departs from using competition to achieve efficiency include government imposition of extensive safety regulations and minimum quality standards. Additionally, in specific industries such as telecommunications, regulatory bodies have imposed pricing regulations (including maximum price regulation of various services), cost-based regulation on pricing of interconnection between competitors, and below cost pricing of basic telephone service (with the aim to maximize subscription to achieve "universal service"). For an analysis of regulation in telecommunications that imposes departures from allocative efficiency, see Nicholas Economides, *Telecommunications Regulation: An Introduction*, in THE LIMITS OF MARKET ORGANIZATION 48, 62 (Richard R. Nelson ed., 2005), available at http://www.stern.nyu.edu/networks/Economides_Telecommunications_Regulation.pdf.

4. With a constant returns to scale technology of production, where unit cost remains constant for any level of production, competition among producers leads the market to maximization of total surplus. A monopolist charging a single price in the same market would restrict output resulting in lower total surplus. Such a monopolist would raise prices above marginal cost, thereby reducing allocative efficiency, and may also reduce productive efficiency by not strictly minimizing costs, since it faces no pressure by competition. We should note that the theorem of total surplus maximization, as a result of competition, also holds as long as

allocative and possibly productive static efficiency for an increase in innovative activity. Under the assumption that innovative activity is underprovided without patents, some increase in innovative activity will increase dynamic efficiency. But without a specific calculation that will depend on the particulars of the market(s) involved, it is impossible to judge if the present patent law will lead to an under-provision, over-provision, or the right intensity of innovative activity. The broad legal patent framework that does not calibrate patent duration and breadth by market is likely to often miss achieving the right intensity of innovative activity, and therefore miss guiding the economy to maximum dynamic efficiency. Specifically, there are substantial issues in the design and implementation of patent law that may prevent the market from achieving the appropriate amount of innovative activity that would precipitate dynamic efficiency.⁵

In this Article, we will discuss issues that arise in the intersection of patents and antitrust. We focus on antitrust issues that arise when a patent holder uses the monopoly power it possesses in the market for the patented product to exclude competitors in adjacent markets, which is sometimes broadly called “monopoly leveraging.” The courts have identified several categories of conduct by patent holders that might give rise to claims of monopoly leveraging. Where the patent holder’s product uses an interface or interconnection with adjacent products, a patent holder can attempt to leverage its monopoly into adjacent markets by manipulating the interface. In these circumstances a patent holder is tempted to obtain revenues from adjacent markets by excluding others from selling products or offering services that require its interface. In these situations, the courts have considered and sometimes condemned monopolists’ efforts to control these markets through design changes and

unit costs increase for sufficiently large levels of production. However, when unit costs are decreasing for *any* level of production, competition does not necessarily result in total surplus maximization. The same is true in the presence of network effects (increasing returns to scale in consumption). *E.g.*, Nicholas Economides & Fredrick Flyer, *Compatibility and Market Structure for Network Goods* (Stern Sch. of Bus., N.Y.U., Discussion Paper No. EC-98-02, 1997), available at <http://www.stern.nyu.edu/networks/98-02.pdf> (showing that, with strong network effects, competition may maximize consumers’ surplus but monopoly may maximize total surplus).

5. From a public policy point of view, the question is not just whether a particular invention is given a monopoly of a sufficient duration to guarantee sufficient incentives for this innovation. There is an additional question of whether later innovators also have sufficient incentives to innovate despite the rights conferred to an early innovator. Thus, the extent of monopoly conferred by a patent has to be limited skillfully so as not to interfere with the incentive to innovate of subsequent innovators. *See also* Richard J. Gilbert & Michael L. Katz, *Should Good Patents Come In Small Packages? A Welfare Analysis of Intellectual Property Bundling*, COMPETITION POLY CENTER (Inst. of Bus. & Econ. Research, Berkeley, Cal.), Jan. 27, 2007, available at <http://repositories.cdlib.org/cgi/viewcontent.cgi?article=1067&context=iber/cpc>.

product changes which, in effect, extend in time or expand in scope the claims of the original monopoly granted by a patent or other intellectual property.

I. PATENTS

Valid and enforceable patents give the owner a legal right to exclude others from using the claimed invention for a limited time.⁶ Examiners at the United States Patent and Trademark Office (“USPTO”) apply five principal criteria to determine patentability of an invention: (1) is the subject matter statutorily patentable?;⁷ (2) is the claimed invention novel?;⁸ (3) is the claimed invention useful?;⁹ (4) is the claimed invention non-obvious?;¹⁰ and (5) has the inventor described the invention with enough particularity such that those skilled in the art will be able to make, use, and understand the invention that the inventor made?¹¹ If the patent applicant meets the statutory criteria, the examiners have no discretion: they must issue the patent.¹² Issuance of a patent does not necessarily mean that the claimed invention is fundamentally innovative; the patent will issue if the claimed invention is simply sufficiently different from what came before it.¹³

Once issued, the patent is presumed valid.¹⁴ Patent validity is tested in the crucible of litigation. Challengers to patent rights must overcome the presumption of validity. Decisionmakers, such as judges and juries, use this presumption as a procedural tool in resolving disputes. “The decisionmaker is required to begin by accepting the proposition that the patent is valid and then looking to the challenger for proof to the contrary.”¹⁵ The challenger bears the burden through any administrative proceeding or trial to prove that the patent is invalid; the burden never shifts to the patent holder to prove that the patent is valid.¹⁶

6. ROBERT L. HARMON, PATENTS AND THE FEDERAL CIRCUIT 4-5 (8th ed. 2007).

7. 35 U.S.C. § 101 (2006) (patentable subject matter includes “any new and useful process, machine, manufacture, or composition of matter, or any new and useful improvement thereof”).

8. *Id.* § 102.

9. *Id.* § 101; see text accompanying *supra* note 7.

10. *Id.* § 103(a) (to be patentable, it must be non-obvious “at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains”).

11. *Id.* § 112.

12. HARMON, *supra* note 6, at 6.

13. See HERBERT HOVENKAMP, MARK D. JANIS, & MARK A. LEMLEY, IP AND ANTITRUST: AN ANALYSIS OF ANTITRUST PRINCIPLES APPLIED TO INTELLECTUAL PROPERTY LAW 12-26 (2007).

14. 35 U.S.C. § 282.

15. HARMON, *supra* note 6, at 34 (citing *Lear Siegler, Inc. v. Aeroquip Corp.*, 733 F.2d 881 (Fed. Cir. 1984)).

16. *Id.*

When the applicant is prosecuting his patent application, the examiner does not perform any cost/benefit analysis specific to the invention, the firms, the potential markets affected by the patent, or the impact of the patent in these markets. Examiners at the USPTO do not conduct any examination of the costs and benefits of conferring upon the inventor the right to exclude others from using the claimed invention. Patent examiners typically possess degrees in science, engineering, or law. They are not experienced policy makers, they do not see themselves as policy makers, and they have no authority to make policy. The examiners do not analyze the markets where the methods or products claimed by the patents will be sold. They do not inquire whether the patentee will practice the patent by producing a product or using the claimed invention, or whether the patentee will sit on its patent rights and simply use the threat of enforcement to keep others from using its invention. They do not inquire whether the patentee will license others to use the invention and, if so, at what rates.

The issuance of any patent in its nascent state suffers from additional defects. First, patents give property rights with considerable uncertainty as to their validity.¹⁷ This uncertainty arises in two ways: there is uncertainty over the precise boundaries of the patented claims and there is uncertainty about the claims' validity and enforceability.¹⁸ Accordingly, every child born in our patent kingdom is a pretender to a throne. Also, the duration of every patent is uniform, although economic theory shows that it should depend on the particulars of market and other factors. Patent rights are at best justified in law (but not in a case-by-case examination) based on *ex ante* expected profits. Additionally, patents may confer legal monopoly rights in more than one antitrust market.¹⁹ For example, an inventor who obtains a patent on a drug used to induce sleep might later find that it alleviates symptoms associated with diabetes. Or, the patentee might find that by slightly modifying the formula, it can obtain a new patent and exclude a potential

17. See Mark A. Lemley & Carl Shapiro, *Probabilistic Patents*, 19 J. ECON. PERSP. 75, 76 (2005).

18. The uncertainty of patent claims arises because of the litigation process to enforce the claims. For example, the terms used in a granted claim may be ambiguous until a court construes them. *Markman v. Westview Instruments, Inc.*, 517 U.S. 370 (1996). Or, an accused device might not literally infringe the claim, but does infringe under the doctrine of equivalents. *Festo Corp. v. Shoketsu Kinzoku Kogyo Kabushiki Co.*, 535 U.S. 722, 732 (2002). And a claim could be found to be invalid because it is obvious. *KSR Int'l Co. v. Teleflex Inc.*, 127 S. Ct. 1727 (2007). These are just a few examples of the uncertainty that arises for plaintiffs and defendants in patent litigation.

19. A claim for violation of the antitrust laws requires the plaintiff to identify a relevant, economically significant product market. *B.V. Optische Industrie De Oude Delft v. Hologic, Inc.*, 909 F. Supp. 162, 172 (S.D.N.Y. 1995). An allegation that a particular product is "unique", due to patent protection or otherwise, is insufficient to state a claim. *Id.*

rival from both the old market and the new market. An appropriately worded patent will permit the inventor of this single drug to exclude others from using the drug in two or more different antitrust markets.

As economists have long argued, and the United States Supreme Court definitively ruled in 2006, the ownership of a patent does not burden the patent owner with a presumption that it possesses monopoly power in any particular market.²⁰ Eight years before the Supreme Court's antitrust jurisprudence caught up to economic theory, Congress had passed an amendment to the U.S. patent laws to relieve patent owners of the presumption that the ownership of a patent, without more, subjected them to claims of unfair competition by enforcing valid patents.²¹

The converse of the rule eliminating the congruence between patent ownership and market power, however, is that the antitrust market in which a patentee possesses market power might extend beyond the four corners of the patent grant. If the patentee has market power beyond the four corners of the patent, then the immunity from suit granted by Congress for enforcement of the patent should not extend to the full boundaries of the antitrust market. The key questions for both patentees and economists are determining the borders of the lawful patent monopoly and the types of conduct that unlawfully leverages the patent grant beyond those borders. The importance of these questions to policy makers is that appropriate enforcement will enhance consumer welfare. The importance of these questions to the patent holder is that it might find itself subject to government enforcement action, criminal liability, private antitrust suits, civil damages, and treble damages.²²

II. INTERSECTION OF PATENTS AND ANTITRUST

There are a number of issues that arise in antitrust enforcement from the vague definition and the leveraging of patents.²³ Antitrust examines business *conduct* based on existing property rights. Any property right, based on real or intellectual property, can be abused in business conduct resulting in an antitrust violation.²⁴ Thus, when

20. *Ill. Tool Works Inc. v. Indep. Ink, Inc.*, 547 U.S. 28, 42-43 (2006).

21. Act of Nov. 19, 1988, § 201, 35 U.S.C. § 271(d)(4)-(5) (2006).

22. 15 U.S.C. § 2 (2006).

23. We omit from discussion in this Article issues that pertain to conspiracies to restrain trade. We focus here only on single firm conduct and we do not discuss antitrust issues that arise from attempts to collude using patent pools as a pretext. For a more extensive discussion of these issues, see Richard J. Gilbert, *Antitrust for Patent Pools: A Century of Policy Evolution*, 2004 STAN. TECH. L. REV. 3 (2004); Carl Shapiro, *Antitrust Limits to Patent Settlements*, 34 RAND J. ECON. 391 (2003).

24. See, e.g., *United States v. Microsoft Corp.*, 253 F.3d 34, 63 (D.C. Cir. 2001) (antitrust defendant's claim that it had "an absolute and unfettered right to use its intellectual

property rights are well defined, there is nothing special in regard to rights arising out of a patent grant or other intellectual property protection.

When patents and antitrust potentially clash, typically antitrust examination and enforcement will occur (i) after the grant of a patent; (ii) where a product based on a patent has successfully reached the market; and (iii) where the grantee managed to get monopoly power in a market. Thus, typical antitrust violations will occur for relatively few issued patents because of the winnowing process that takes place between issuance of a patent and its assertion against an alleged infringer by a monopolist. It is very difficult to anticipate a conflict between the granting of a patent and antitrust rules at the time of the grant because of the time separating the patent examination and the potential antitrust violation, and various other factors involved how the patent holder develops products and achieves market power. Patent examiners do not consider potential antitrust violations prior to granting a patent. Antitrust examination and intervention are *ex post* to the patent grant. It is impossible to conceive an *ex ante* patent examination process that could address all of the defects which the USPTO's constituents, such as technology firms and pharmaceutical companies, discussed below, have identified.

Because of the very significant uncertainty of the infringement, validity, and enforceability of a patent, some commentators have referred to patents as "lottery tickets."²⁵ Inventors apply for patents on the off-chance that their invention might be a huge commercial success. The cost to apply for and prosecute a patent application using a law firm is relatively low in comparison to the possible pay-off.²⁶ In fact, most inventors are disappointed with their patents, since they cannot even muster the few hundred dollars to pay the maintenance fees over the life of the patent after it is issued.²⁷ But once a patent is issued, the patent holder can authorize a law firm to circulate threats of infringement, serve demand letters, and file lawsuits. Defending these lawsuits may cost

property as it wishes" was held to be "no more correct than the proposition that use of one's personal property, such as a baseball bat, cannot give rise to tort liability").

25. Lemley & Shapiro, *supra* note 17, at 80-83.

26. The average costs for filing a new patent application are approximately range \$15,398 for a complex chemical or biological patent, \$13,684 for a complex electrical or computer patent, \$11,482 for a complex mechanical patent, and \$8,548 for a patent of minimal complexity with 10 pages and 10 claims. AM. INTELLECTUAL PROP. LAW ASS'N, 2007 REPORT OF THE ECONOMIC SURVEY I78-80 (2007). Costs to prepare an amendment to respond to a USPTO Office Action average approximately \$4,448 for complex biotechnology or chemical patents, \$3,910 for complex electrical or computer patents, \$3,506 for complex mechanical patents, and \$2,244 for patent of minimal complexity. *Id.*

27. Lemley & Shapiro, *supra* note 17, at 80 (noting that 55-67% of patents lapse before the end of their term because maintenance fees are not paid).

hundreds of thousands or millions of dollars, even if they result in dismissal and a complete vindication of the alleged infringer's defenses.²⁸

Congress has sought to find a solution through legislation,²⁹ but the divergent interests of the patent system's constituents has thus far prevented consensus on a legislative fix. The solution to the conflict between patents and antitrust will not be found in *ex ante* legislation or patent examination procedures. It must be found in *ex post* enforcement of the patent and antitrust laws.

Companies in different sectors of the economy have various and conflicting complaints of the patent system. Software and technology companies complain that the USPTO should raise the standards for granting patents.³⁰ They complain that the USPTO grants too many patents. Patent infringement suits are expensive to defend. As a result, software and technology companies argue for more stringent standards to obtain patents, or less onerous penalties for alleged infringement, such as limiting the circumstances under which treble damages would be awarded.³¹ On the other hand, pharmaceutical and chemical companies argue for a strong patent regime.³² These companies want the USPTO to issue patents for their inventions and they want enforcement to be easier in order to protect the significant investment—sometimes hundreds of millions of dollars—that they have incurred to bring a drug or treatment to market.³³

If we accept the premise embodied in United States patent law, that a valid and enforceable patent confers a limited monopoly, the only check on potential abuse of that monopoly is antitrust law. The statutory patent monopoly either grants the patentee immunity from the antitrust laws or the patentee is subject to the antitrust laws in markets adjacent to the invention claimed by the patent.³⁴ If the patent confers upon the

28. AM. INTELLECTUAL PROP. LAW ASS'N, 2005 REPORT OF THE ECONOMIC SURVEY 22-26 (2005). According to the 2005 AIPLA Survey, which is published bi-annually, the median litigation cost of a patent lawsuit ranged from \$650,000 (where there was less than \$1.0 million in dispute) to \$4.5 million (where there was more than \$25 million at risk).

29. Recent past and current proposed legislation considered in Congress includes Patent Reform Act of 2005, H.R. 2795, 109th Cong. (2005), Patents Depend on Quality Act of 2006, H.R. 5096, 109th Cong. (2006), Patent Reform Act of 2006, S. 3818, 109th Cong. (2006), Patent Reform Act of 2007, H.R. 1908, 110th Cong. (2007), and Patent Reform Act of 2007, S. 1145, 110th Cong. (2007).

30. See, e.g., Gregg Hitt, *Industries Brace For Tough Battle Over Patent Law*, WALL ST. J., June 6, 2007, at A1 (noting that Microsoft and Cisco are promoting legislation to make patents "harder to get, and easier to challenge").

31. *Id.*

32. *Id.* (noting that Eli Lilly & Co. and Pfizer Inc. oppose legislative changes that will make it easier to launch and win patent challenges).

33. *Id.*

34. See, e.g., *In re Indep. Serv. Orgs. Antitrust Litig.*, 203 F.3d 1322, 1327-28 (Fed. Cir.

patentee absolute immunity from the antitrust laws, our inquiry is at an end since *any* anti-competitive conduct of the patentee in adjacent markets is shielded from antitrust scrutiny. If, however, the patent does not confer absolute immunity, antitrust laws can still limit the patentee's conduct in antitrust markets adjacent to the patent monopoly. United States antitrust law reflects this policy.³⁵

III. APPLICATION TO ADJACENT MARKETS

To understand how antitrust law may apply to markets adjacent to the patent monopoly, consider the following simple case. Let us assume that a company A is awarded a patent that confers exclusive rights to make and sell certain products of type A in a single antitrust market and assume that the company has gained monopoly power in A.³⁶ Assume further that products of type B are complementary to A and are produced by various companies in a separate antitrust market. The market for B is considered an "adjacent" market to the market for A for antitrust purposes. Further, assume company A gains exclusive control over the complementary market between product A and product B by using its patent and monopoly over the market for A to control the interface between the two product types. In particular, company A can modify the interface between product A and product B to exclude any producer of product B or selectively reduce the quality of a combination of product A and product B of particular producers. Thus, the patent holder, company A, can use its monopoly in the market for A to leverage and extend its legally-granted monopoly to the market for B. We argue that company A's actions may violate antitrust law, despite the immunity granted by its patent. This scenario can be extended to a case where the patent holder does not have monopoly power in the market for A but can still control the market for B since the products of type B are only compatible with the particular patented product A.

2000).

35. See, e.g., *Microsoft Corp.*, 253 F.3d 34. The United States Department of Justice ("DOJ") sued Microsoft for, among other things, exclusionary conduct in violation of Section 2 of the Sherman Act on the grounds that Microsoft had used technology to discourage consumers from removing its Internet browser from its operating system, and it had commingled the browser code and operating system code so that removal of Microsoft's browser would disable the entire operating system. Microsoft argued that its intellectual property authorized its conduct. Irrespective of Microsoft's particular conduct alleged by the DOJ, the court of appeals wrote: "Intellectual property rights do not confer a privilege to violate the antitrust laws." *Id.* at 63 (citing *In re Indep. Serv. Orgs. Antitrust Litig.*, 203 F.3d at 1325).

36. As we have discussed earlier, legal monopoly rights do not necessarily imply monopoly power in an antitrust market. A firm with legal monopoly rights in a particular product may face considerable competition from close substitutes and therefore have no monopoly power.

For example, the market for A may consist of durable goods and the market for B may consist of products and services that are purchased after product A, such as maintenance plans, parts, or supplies that are needed over the lifetime of the patented product sold by company A. In other cases, the sequence of purchases of product A and product B is not crucial. In particular, product A may be a patented computer operating system while products of type B are software applications that are compatible only with this operating system, with both the operating system and applications purchased in the same transaction. The adjacent markets are not necessarily subject to network effects, except those that arise from the direct complementarity between product A and product B.³⁷

From an economics point of view, a properly designed patent system should give company A a temporary monopoly franchise only for the patented invention, embodied in product A. The prospect of a temporary monopoly and the resulting monopoly rents should be a sufficient incentive for company A to engage in the innovation required to produce a novel and non-obvious product A. For the duration of the patent monopoly, society temporarily trades the loss in consumer surplus for the adequate incentive for company A to invent product A. Given the loss of consumer surplus, this incentive ideally should be as exact as possible, offering potential innovators no more than is necessary. It is economically inefficient and therefore inappropriate for a patent system to offer potential innovators a greater incentive than is necessary. We focus on how this inefficient excess incentive may influence adjacent markets. In this instance, company A might gain an additional monopoly in the adjacent market for B by leveraging its monopoly in the market for product A, resulting in a loss in consumer surplus in both the market for A *and* the market for B. The additional loss of consumer surplus in the adjacent market for B may not be economically warranted if company A already has an adequate incentive from its temporary monopoly in the market for A. The impact of this potential economic inefficiency is directly correlated to the number of complementary goods—and resulting adjacent markets—product A enjoys. For example, a new patented drug may be complementary with a syringe to administer it, specialized medical services, hospital facilities and procedures, and so on.

Among economists, there has been a considerable discussion on whether a monopolist in the market for A is able to reap additional

37. See Nicholas Economides, *The Economics of Networks*, 14 INT'L J. INDUS. ORG. 673, 675-99 (1996), available at http://www.stern.nyu.edu/networks/Economides_Economics_of_Networks.pdf.

monopoly profits of a complementary product B. The so-called “Chicago School Theory,” first proposed in the 1950s by Aaron Director and Edward Levi, states that there is a “single monopoly profit” in the combination of a sale of product A with product B, and therefore any leveraging of the monopoly in market A over market B cannot be attributed to anti-competitive motivations.³⁸ According to the Chicago School Theory, if company A attempts to control market B, it must be for efficiency-enhancing reasons. Today, it is well understood that the Chicago School Theory holds only in very exceptional circumstances that rarely arise in typical patent leveraging cases.³⁹ Therefore, for almost all cases of adjacent markets, it should be understood that monopoly profits in market B are not captured automatically by a monopolist in market A. The more typical patent-leveraging scenario, however, is a “dual monopoly profits” case, where company A cannot reap the monopoly profits in market B by mere virtue of its patent for product A and the ensuing temporary monopoly in market A.

When the circumstances are such that the single monopoly profit theory holds, we might consider the patent system optimized if company A receives a patent in product A since company A will limit its leveraging of monopoly in market A to gain monopoly profits in both market A and market B in only those instances where it is economically efficient. In contrast, if we are in a dual monopoly profits scenario, it would not be appropriate for the patent system to reward company A (the patent holder for product A) with a monopoly in market B and let company A reap monopoly profits from product B, thereby reducing consumer surplus of product B. In neither case is it appropriate for antitrust immunity to award additional profits in product B to the patent holder for product A. In the single monopoly profit case, the monopolist of market A has already reaped the economically efficient profits in product B through the patent for A. In the dual monopoly profits case,

38. See Aaron Director & Edward H. Levi, *Law and the Future: Trade Regulation*, 51 NW. U. L. REV. 281, 290 (1956).

39. For the single monopoly profit theory to be correct, it is required that products A and B are combined in a fixed and constant ratio irrespective of the prevailing prices, each buyer buys only one unit, there is perfect foresight, market B is perfectly competitive, and the goods are produced with a constant returns to scale technology (has constant unit cost). These requirements are very restrictive and typically at least one of them fails to hold, thereby invalidating single monopoly profit theory. First, most complementary goods are consumed in variable proportions depending on prices. For example, when the prices of ink and paper are low, more of them are used in conjunction with the same printer. Second, many buyers buy more than one unit of a good. For example, a hospital buys many units of beds, of each type of drug, and so on. Third, in many markets consumers do not have sufficient information to calculate future costs. Fourth, in many markets competition is weak or non-existent. Fifth, for most goods, unit cost varies with the number of units produced. See also Joseph Farrell, *Deconstructing Chicago on Exclusive Dealing*, 50 ANTITRUST BULL. 465 (2005).

it is not appropriate for company A to receive antitrust immunity when its actions might harm consumers in the market for B. Company A has the incentive to engage in anti-competitive leveraging of its patent in product A to earn additional monopoly profits from product B in excess of that required to innovate in market A.

In the single monopoly profit case, the monopolist of market A does not need to take anti-competitive leveraging action, since he already reaps monopoly profits of product B. In contrast, in the dual monopoly profits case, the monopolist of market A can take a number of anti-competitive actions. Many of these actions can be monopoly maintenance and tying actions that are available to a monopolist irrespective of the source of his monopoly power.⁴⁰ Additionally, there are anti-competitive actions that arise directly from the control of the interface between product A and product B because of company A's patent on product A. We focus on instances when patent holders extend their temporary monopoly over the market for the patented product to adjacent markets by controlling the interface with complementary products.⁴¹ Interfaces have become increasingly important as growth in productivity depends more and more upon networks and the ability to add on applications, or replace old parts with new. Controlling the interface becomes important for the patent holder, the consumers who demand innovation and change, and the competitors who seek to deliver either the desired innovation and change or similar products at a lower price.

Antitrust case law provides a number of examples where patent holders have had their wrists slapped for trying to extend their patent

40. See Kaplow & Shapiro, *supra* note 2, at 1226; Jeffrey K. MacKie-Mason & John Metzler, *Links Between Markets and Aftermarkets: Kodak (1997)*, in ANTITRUST REVOLUTION: ECONOMICS, COMPETITION AND POLICY 428, 452 (John E. Kwoka & Lawrence J. White eds., 2003); Patrick Rey & Jean Tirole, *A Primer on Foreclosure*, 3 HANDBOOK OF INDUSTRIAL ORGANIZATION 2145, 2219 (Mark Armstrong & Robert H. Porter eds., 2007), available at <http://idei.fr/doc/by/tirole/primer.pdf>; Michael D. Whinston, LECTURES ON ANTITRUST ECONOMICS (2006); BARRY NALEBUFF, DEPT OF TRADE & INDUS., BUNDLING, TYING, AND PORTFOLIO EFFECTS, PART 1: CONCEPTUAL ISSUES (2003), available at <http://www.berr.gov.uk/files/file14774.pdf>.

41. In many traditional mechanical products, the interfaces can be observed directly or established through reverse engineering. In the world of software, interfaces are much more difficult to decipher and reverse engineer. Thus, even firms without patents can control interfaces. A good example of this is the interfaces of the Windows PC operating system with software applications. Applications developers have to rely on Microsoft information on these interfaces, commonly called Application Protocol Interfaces ("APIs") because they cannot reverse engineer them. Fortunately for developers, Microsoft has a strong interest to disclose these APIs to producers of software that is complementary to Windows so that more applications get written for Windows and the value and sales of Windows are enhanced. However, this interest is reversed when Microsoft also produces the complementary goods in competition with third-party developers, such as the office productivity applications including Word, Excel, and Outlook bundled under Microsoft Office.

monopolies into adjacent markets, even though courts have exercised considerable restraint.⁴² This restraint is based upon three key concerns. First, judges and juries are not necessarily qualified to determine whether the needs of the marketplace justify a particular product offering.⁴³ Second, courts do not want to curb innovation by imposing restrictions on normal technological advancements.⁴⁴ Third, courts are reluctant to inquire into the patentee's state of mind when the patentee asserts that its patents give it a right to exclude competitors.⁴⁵

Courts diverge in handling the third concern. The First, Ninth, and D.C. Circuits have authorized judges and juries to view with skepticism the claim by an intellectual property owner that its intellectual property rights give it unfettered control over adjacent markets.⁴⁶ By contrast, the Federal Circuit has precluded judges and juries from inquiring into the patentee's state of mind when it asserts a valid patent.⁴⁷ Despite these conflicts between circuits, there exists a middle ground where antitrust law trumps patent law in adjacent markets. In these adjacent market cases, it is inappropriate for patentees to gain immunity from antitrust law because judges, juries, and antitrust enforcers have more than sufficient skill and judgment to discern the difference between fair competition and unreasonable market manipulation.

We discuss four types of adjacent markets where the antitrust laws hold equal, if not superior, sway to the patent laws in achieving the proper level of economic efficiency: (i) complementary peripherals and

42. See, e.g., *Microsoft Corp.*, 253 F.3d at 63; *C.R. Bard, Inc. v M3 Sys., Inc.*, 157 F.3d 1340 (Fed. Cir. 1998); *Image Technical Servs., Inc. v. Eastman Kodak Co.*, 125 F.3d 1195 (9th Cir. 1997).

43. *Medtronic MiniMed Inc. v. Smiths Med. MD Inc.*, 371 F. Supp. 2d 578, 589 (D. Del. 2005) ("Absent evidence of anticompetitive conduct, however, it is not the role of the courts to determine how companies should innovate."); *ILC Peripherals Leasing Corp. v. Int'l Bus. Machs. Corp.*, 458 F. Supp. 423, 439 (N.D. Cal. 1978) ("Where there is a difference of opinion as to the advantages of two alternatives which can both be defended from an engineering standpoint, the court will not allow itself to be enmeshed 'in a technical inquiry into the justifiability of product innovations.'" (citation omitted)), *aff'd sub nom. Memorex Corp. v. Int'l Bus. Machs. Corp.*, 636 F.2d 1188 (9th Cir. 1980).

44. See *Microsoft Corp.*, 253 F.3d at 63 (noting that courts are skeptical about claims that competition has been harmed by a dominant firm's product design changes); *Berkey Photo, Inc. v. Eastman Kodak Co.*, 603 F.2d 263, 286 n.30 (2d Cir. 1979) (noting that courts should "exercise caution" in condemning a monopolist merely for introducing new products).

45. See, e.g., *In re Indep. Serv. Orgs. Antitrust Litig.*, 203 F.3d at 1327-28 (refusing to inquire into subjective motivation of patentee to refuse to sell or license its patented works, or to bring suit to enforce the same right).

46. *Microsoft Corp.*, 253 F.3d at 63; *Image Technical Servs.*, 125 F.3d 1195; *Data Gen. Corp. v. Grumman Sys. Support Corp.*, 36 F.3d 1147, 1184 (1st Cir. 1994).

47. See *In re Indep. Serv. Orgs. Antitrust Litig.*, 203 F.3d at 1327 (declining to follow *Image Technical Servs.*, 125 F.3d 1195); but see *C.R. Bard*, 157 F.3d 1340 (jury could conclude that patentee unlawfully monopolized adjacent market through design changes to patented product).

software markets; (ii) aftermarket parts, maintenance, and service; (iii) interface design changes; and (iv) changes in drug formulas. The specific anti-competitive conduct and actual effect in each of these markets may differ, but the general tactic is the same: the patentee extends the patent monopoly beyond the market for the patented product.⁴⁸ As we discuss below, in these four types of adjacent markets, the patentee will typically lose the immunity otherwise provided by patent law. Instead, courts routinely apply regular antitrust principles to resolve disputes between the patent-holder monopolist in market A and the potentially-harmed competitor in market B.

A. *Complementary Peripheral and Software Markets*

This section describes how courts apply antitrust law to determine when a monopolist in one market uses its intellectual property rights—patent and otherwise—to engage in an unreasonable restraint of trade in complementary adjacent markets for computer and telephony peripherals and software.

Early cases involved antitrust suits by computer peripheral device makers against IBM after IBM changed the design of the physical plug interface to its computers in a way that rendered prior peripheral plug designs incompatible. The judicial debate over the antitrust implications of product innovations has been framed by two conflicting views developed in these cases. The prevalent view is that a product change that has lessened competition for peripheral products is beyond antitrust scrutiny if the monopolist offers any justification for the change. In this view, the courts refuse to evaluate technical decisions and the pros and cons of different design choices.

While these cases did not involve antitrust claims related to leveraging of patent monopolies, their holdings established a framework for deciding when a dominant firm uses intellectual property, in the general sense, to engage in conduct that unreasonably restrains trade in adjacent markets. Also, none of these early cases directly involved the assertion of patents by IBM against the peripheral parts competitors. That development occurred after the courts raised the importance of asserting patent and other intellectual property rights to justify certain business behavior by IBM.⁴⁹

48. We purposefully exclude the doctrine of equivalents, which permits a patentee to stretch the claims somewhat beyond the literal boundaries of the claimed invention. *Festo Corp.*, 535 U.S. 722. The markets we describe comprise those markets for products clearly beyond the monopoly created by the granted claims, even assuming the claims have been interpreted to their outermost borders by the doctrine of equivalents.

49. See *Image Technical Servs.*, 125 F.3d 1195. Also, in *Telex Corp. v. International Business Machines Corp.*, the plaintiff initially filed an antitrust claim, which IBM met with a

In *Telex Corp. v. IBM*, the plaintiff alleged that IBM had unlawfully monopolized the market for plug-compatible peripheral products for IBM computers, such as information storage components, which include magnetic tape drives, magnetic disk drives, magnetic drums, printers, and other specialized memory units.⁵⁰ The court found that IBM did not have monopoly power in the market for plug-compatible peripheral products because competition existed between various system manufacturers and because manufacturers of peripheral devices could easily shift production from IBM to non-IBM plug-compatible peripherals, and vice versa.⁵¹ Additionally, IBM did not have market power in the relevant market and its product changes produced lower prices. While these lower prices were still above cost, they were not predatory.⁵²

Although the plaintiff in *Telex* challenged only the lower prices associated with IBM's new products and not whether the design changes created incompatibility with competing devices, plaintiffs in later cases claimed IBM changed its plug design to harm competition. In *ILC Peripherals v. IBM Corp.*, the plaintiff was a maker of external storage devices that were plug-compatible with IBM computers, including disk drives, disk drive control units, and communications control units.⁵³ The plaintiff alleged that IBM made design changes to plugs and controllers on its computers to render the computers incompatible with the products of competitors in this market.⁵⁴ The experts who testified for both sides disagreed on the degree to which the changes were innovative and the amount of legitimate consumer benefit derived from said changes.⁵⁵ After an extensive review of the product changes and the testimony, the court held that the peripheral manufacturer failed to carry its burden that IBM's conduct had been anti-competitive.⁵⁶ It did not help that the evidence showed that the plaintiff was not making devices that depended upon IBM-compatible plugs.⁵⁷

In a subsequent case, another judge attempted to formulate a general standard in Sherman Act Section 2 cases involving product design changes in which a competitor challenged the new product

counterclaim for trade secret misappropriation and copyright infringement of certain manuals. 510 F.2d 894, 898 (10th Cir. 1975). IBM did not appeal the district court's decision on its copyright claim. *Id.* at 928. Nor did IBM assert infringement of any of its patents.

50. *Id.* at 899.

51. *Id.* at 916, 919.

52. *Id.* at 919-928.

53. *ILC Peripherals Leasing Corp.*, 458 F. Supp. at 428.

54. *Id.*

55. *Id.* at 439.

56. *Id.* at 439-40.

57. *Id.* at 439.

introductions of an alleged monopolist. *In re IBM Peripheral EDP Devices Antitrust Litigation*,⁵⁸ makers of peripheral devices compatible with IBM mainframe computers challenged IBM's design of its products, which prevented the use of the competitors' peripheral devices. The court held:

If the design choice is unreasonably restrictive of competition, the monopolist's conduct violates the Sherman Act. This standard will allow the factfinder to consider the effects of the design on competitors; the effects of the design on consumers; the degree to which the design was the product of desirable technological creativity; and the monopolist's intent, since a contemporaneous evaluation by the actor should be helpful to the factfinder in determining the effects of a technological change.⁵⁹

This case did not involve patents, but its holding is close to where the courts have ended up in cases that do involve patent holders whose conduct unreasonably restrains trade in adjacent markets.

Courts have also found that a monopolist can be held liable for making design changes to its interfaces that prevent competitors from selling their otherwise compatible products. In *Northeastern Telephone Co. v. American Telephone & Telegraph Co.*, the court held that a monopolist could be found liable under antitrust law because it intentionally designed a telephone network coupling device with diminished functionality in order to impede competition.⁶⁰ The court noted: "In other circumstances, we might be reluctant to allow a jury to second-guess engineers' decisions as to the proper construction of a sophisticated piece of equipment. But in this case we cannot look to the reaction of the competitive market to determine whether one design is superior to another."⁶¹ Thus, the court in this case found antitrust liability because the interface was manipulated to diminish the quality of the complementary good when produced by competitors. While this case did not involve the assertion of patent rights, it stated a general proposition for when a court should scrutinize interface design decisions of patent holders if the temporary monopoly created by the patent removes the presumption that interface design changes are the inherently

58. 481 F. Supp. 965 (N.D. Cal. 1979), *aff'd on other grounds sub nom.* Transamerica Computer Co. v. Int'l Bus. Machs. Corp., 698 F. 2d 1377, 1382 (9th Cir. 1983).

59. *Id.* at 1003; *see also* Cal. Computer Prods., Inc. v. Int'l Bus. Machs. Corp., 613 F.2d 727 (9th Cir. 1979) (plaintiffs challenged IBM's integration of disk drive controllers into its newest computers on antitrust grounds, but the court rejected plaintiffs' claim finding that the integrated products performed the same function as the old components about as well, but were significantly cheaper, which resulted in consumer benefit).

60. *Ne. Tel. Co. v. Am. Tel. & Tel. Co.*, 651 F.2d 76, 95 (2d Cir. 1981).

61. *Id.* at 94-95 & n.29.

superior result of competitive market forces.

Courts have also been willing to curb operating system software monopolists' efforts to impede consumers' use of complementary software applications developed by competitors. In *United States v. Microsoft Corp.*,⁶² the D.C. Circuit examined Microsoft's design of its Windows operating system and its potential anti-competitive effect on complementary software applications, especially Internet browsers developed by third-parties such as Netscape, which competed with Microsoft's Internet Explorer.⁶³ The lower court found Microsoft liable for a wide range of anti-competitive conduct.⁶⁴ In reviewing the district court's opinion, the D.C. Circuit identified two areas where Microsoft could have been found to have violated the antitrust laws.⁶⁵ First, the court found that Microsoft used its Original Equipment Manufacturer ("OEM") licenses with personal computer sellers such as Dell and Hewlett-Packard to prohibit the OEMs from installing rival Internet browsers or modifying the operating system's start-up sequence.⁶⁶ This practice ensured Microsoft's Internet Explorer would always be displayed to the user instead of a rival's browser.⁶⁷ Second, the D.C. Circuit found that Microsoft had taken steps to inextricably integrate its Internet Explorer browser with its operating system in a manner that discouraged end users from using competing Internet Web browsers.⁶⁸

Microsoft justified its actions in two ways. First, Microsoft asserted that because it owned the copyright to the Windows operating system and display, it had the right to dictate how the system started up.⁶⁹ Second, Microsoft claimed its integration of the operating system and Internet Explorer was necessary for stability and consistency of the platform.⁷⁰ In ruling on these issues, the court noted, "[a]s a general rule, courts are properly very skeptical about claims that competition has been harmed by a dominant firm's product design changes."⁷¹ The court elsewhere stated, "[a] monopolist does not violate the antitrust laws simply by developing a product that is incompatible with those of its rivals. . . . In order to violate the antitrust laws, the incompatible product must have an anticompetitive effect that outweighs any procompetitive

62. *Microsoft Corp.*, 253 F.3d 34.

63. *Id.* at 60-74.

64. *Id.* at 58.

65. *Id.* at 71, 74.

66. *Id.* at 60-64.

67. *Id.* at 61.

68. *Microsoft Corp.*, 253 F.3d at 64-67.

69. *Id.* at 62-63.

70. *Id.* at 63-64.

71. *Id.* at 65.

justification for the design.⁷² Nonetheless, despite this professed skepticism about the government's claims, the court upheld the district court's finding that Microsoft had used anti-competitive design tactics.⁷³ In particular, the court held that Microsoft could not assert its intellectual property rights as a copyright owner to exclude competition in the separate market for Internet browsers.⁷⁴ The court further found that Microsoft offered no evidence that the stability of the platform would suffer if changes were made.⁷⁵ In general terms, the *Microsoft* court scrutinized a monopolist's decisions in designing and modifying the interface required to interconnect complementary products from an adjacent market to the monopolist's product in a manner that produced monopoly power within a separate market. Specifically, the court expressly compared the pro-competitive benefits of the design and changes to the interface with the anti-competitive harms that might result if the new design allowed Microsoft to unfairly advantage its own complementary software, at the expense of competitors in the same adjacent market.

The *Microsoft* court's analysis is similar to the balancing test articulated in *In re IBM Peripheral EDP Devices Antitrust Litigation*.⁷⁶ In both cases, the court would permit the judge or the jury to weigh the pro-competitive benefits and the monopolist's justifications for its design changes against the anti-competitive effects to determine whether the design changes are unduly restrictive of competition. In cases involving the assertion of intellectual property, this approach allows the courts to fill the gap in the patent system by using the antitrust laws to address the market failures that occur when patentees try to leverage their monopoly in one market into another adjacent market. A patent system which allows company A to manipulate the interface between product A and product B provides company A with a greater incentive than is necessary to spur innovation. To allow company A to use the interface as a way to extend its monopoly in A into the market for B also decreases consumer surplus because it stifles competition in market B. By proper application

72. *Id.* at 75 (citations omitted).

73. *Id.* at 64.

74. See *Microsoft Corp.*, 253 F.3d at 63-67. The court of appeals stated:

Microsoft's primary copyright argument borders upon the frivolous. The company claims an absolute and unfettered right to use its intellectual property as it wishes: "If intellectual property rights have been lawfully acquired," it says, then "their subsequent exercise cannot give rise to antitrust liability." That is no more correct than the proposition that use of one's personal property, such as a baseball bat, cannot give rise to tort liability.

Id. at 63 (citation omitted); see also Harry First, *Microsoft and the Evolution of the Intellectual Property Concept*, 2006 WIS. L. REV. 1369, 1376-94 (2006).

75. *Microsoft Corp.*, 253 F.3d at 63-64.

76. 481 F. Supp. 965.

of the antitrust laws, courts can enhance competition in market B without eliminating the incentives for company A to engage in the innovation that led to the grant of the patent in A in the first place.

B. Aftermarkets: Parts, Service, and Maintenance

With the Supreme Court's 1992 decision in *Eastman Kodak Co. v. Image Technical Services, Inc.*, the Court signaled a fundamental shift in private litigation of intellectual property antitrust claims within aftermarkets related to intellectual property rights in the primary market.⁷⁷ In *Kodak*, the Court held that a manufacturer of durable goods could be found liable for illegally monopolizing the derivative aftermarket for parts and services for those goods and for refusing to deal with third-party independent service organizations ("ISOs"), even if it possessed patents and copyrights.⁷⁸ In *Kodak*, the defendant manufactured photocopiers and microfilm equipment.⁷⁹ A group of ISOs sued Kodak, alleging that it had used its monopoly in one market—its installed base of reproduction machines—to monopolize the aftermarket for goods and services of those machines.⁸⁰ In the ensuing trial, the ISOs proved that Kodak had refused to sell them parts or to permit its customers to allow the ISOs to service Kodak's machines.⁸¹ Kodak raised as a defense that it had a valid business justification for refusing to deal with the ISOs because it held patents on its replacement parts for its equipment and copyrights on its diagnostic and service software.⁸² A Kodak witness testified, and its lawyers argued, that its intellectual property rights justified its refusal to deal with the ISOs, even though it had not affirmatively filed suit against the ISOs for patent or copyright infringement.⁸³

The Ninth Circuit's 1997 opinion in *Image Technical Services*, after the district court's decision on *Kodak's* remand from the Supreme Court, addressed for the first time the relationship of intellectual property rights and antitrust law and whether a monopolist's refusal to deal with competing providers of complementary goods (the ISOs) could be justified by its patents and copyrights.⁸⁴ The Ninth Circuit held that a monopolist who has achieved a dominant position through its patents and copyrights can violate the Sherman Act by exploiting that dominant

77. *Eastman Kodak Co. v. Image Technical Servs., Inc.*, 504 U.S. 451 (1992).

78. *Id.* at 471-72, 479 & n.29.

79. *Id.* at 455.

80. *Id.* at 455-56.

81. *Image Technical Servs.*, 125 F.3d at 1208-09.

82. *See id.* at 1214.

83. *See id.* at 1218-19.

84. *See id.*

position to attain a monopoly in another market.⁸⁵ While patents and copyrights could be raised as a business justification for a refusal to deal, these intellectual property rights did not confer an absolute immunity from suit.⁸⁶ The Ninth Circuit adopted a rebuttable presumption that the assertion of intellectual property rights constituted a valid business justification for any immediate harm to consumers.⁸⁷ However, this presumption could be overcome by evidence that the assertion of intellectual property rights was a pretext that masked anti-competitive conduct.⁸⁸ The Ninth Circuit held that, in appropriate cases such as *Image Technical Services*, the antitrust laws will trump intellectual property rights.

After *Kodak*, defendants in antitrust cases began to affirmatively assert their patent and other intellectual property rights so that their rivals could not claim that their refusal to grant licenses was a mere “pretext.”⁸⁹ The effect has been that monopolists who own patents assert their intellectual property rights—particularly in cases where the rival might assert violation of the antitrust laws under a *Kodak* theory.⁹⁰

This strategy of asserting patent rights in antitrust actions has been successful and has resulted in at least one significant court opinion rejecting the “rebuttable presumption” articulated in *Image Technical Services*, despite the similarity between defendant’s and Kodak’s conduct. *In re Independent Service Organizations Antitrust Litigation* (“*CSU v. Xerox*”),⁹¹ the plaintiff was an ISO for Xerox photocopiers.⁹² Like Kodak, Xerox developed a policy to stop selling parts to any ISO that was not an end-user of Xerox equipment, after previously selling parts without condition to ISOs for many years.⁹³ Xerox policed its end-users to ensure that they were not selling parts to ISOs. The ISOs continued to purchase parts from a majority-owned European subsidiary of Xerox, until Xerox forced it to stop selling parts to ISOs.⁹⁴ Xerox, like Kodak, also competed with ISOs in the service market.⁹⁵ Furthermore, Xerox

85. *See id.* at 1220.

86. *See id.* at 1215.

87. *Image Technical Servs.*, 125 F.3d at 1219.

88. *See id.*

89. *See, e.g., Telecom Technical Serv. Inc. v. Rolm Co.*, 388 F.3d 820, 823-24 (11th Cir. 2004) (holding that “an antitrust claim could not be brought based on a refusal to sell patented parts or license copyrighted software.”).

90. *See id.* at 824.

91. *In re Indep. Serv. Orgs. Antitrust Litig.*, 203 F.3d at 1327.

92. *See id.* at 1324.

93. *See id.*

94. For a complete description of the facts of the case, see *In re Indep. Serv. Orgs. Antitrust Litig.*, 989 F. Supp. 1131, 1131-34 (D. Kan. 1997).

95. *See In re Indep. Serv. Orgs. Antitrust Litig.*, 203 F.3d at 1327.

had monopoly power in the relevant equipment and parts markets.⁹⁶ And, like Kodak, Xerox owned patents for at least some of its parts (although the exact extent is not clear from the text of the opinion) and held copyrights to its diagnostic software, which was an essential component to servicing its machines.⁹⁷ Xerox refused to sell any parts, or to license its software, to certain ISOs.⁹⁸

The ISO plaintiff alleged that Xerox was attempting to leverage its monopoly power in the high volume equipment and parts markets to acquire and/or maintain monopoly power in the relevant service markets in violation of Section 2 of the Sherman Act.⁹⁹ Xerox contended that the plaintiff had not suffered any antitrust injury because the alleged injury was attributable to Xerox's lawful refusal to sell patented parts and copyrighted software.¹⁰⁰ Xerox also contended that the plaintiff could not assert a patent or copyright misuse defense to Xerox's infringement counterclaims based on Xerox's unilateral refusal to deal.¹⁰¹ The trial court and the Federal Circuit Court of Appeals agreed with Xerox.

Declining to follow the Ninth Circuit's decision in *Image Technical Services* permitting a jury to consider Kodak's motives for refusal to deal with the ISOs, the court in *CSU v. Xerox* held:

We see no more reason to inquire into the subjective motivation of Xerox in refusing to sell or license its patented works than we found in evaluating the subjective motivation of a patentee in bringing suit to enforce that same right. In the absence of any indication of illegal tying, fraud in the Patent and Trademark Office, or sham litigation, the patent holder may enforce the statutory right to exclude others from making, using or selling the claimed invention free from liability under the antitrust laws. We therefore will not inquire into the subjective motivation for asserting his statutory rights, even though his refusal to sell or license his patented invention may have an anticompetitive effect, so long as that anticompetitive effect is not illegally extended beyond the statutory patent grant.¹⁰²

The United States Supreme Court has not resolved the apparent conflict between *Image Technical Services* and *CSU v. Xerox*.

Despite the differences between *CSU v. Xerox* and *Image Technical Services* over the question of subjective motivation and intent, the two circuits share a common belief that a patent holder cannot use anti-

96. *See id.*

97. *See id.* at 1324.

98. *Id.*

99. *Id.*

100. *Id.*

101. *In re Indep. Serv. Orgs. Antitrust Litig.*, 203 F.3d at 1324.

102. *Id.* at 1327-28.

competitive means to extend its patent rights beyond the statutory grant. In *CSU v. Xerox*, the Federal Circuit distinguished *Image Technical Services* as a tying case, but in essence agreed that a patent holder who unreasonably ventures beyond the boundaries of the patent grant could be held liable for antitrust violations.¹⁰³ As the court in *CSU v. Xerox* reasoned:

Properly viewed within the framework of a tying case, the footnote in [*Image Technical Services*] can be interpreted as restating 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*.¹⁰⁴

In *Image Technical Services*, the Ninth Circuit relied on its rebuttable presumption that the assertion of intellectual property rights constitutes a business justification to an alleged infringer's antitrust claims.¹⁰⁵ It permitted the challenger to the monopolist's conduct to offer evidence to rebut the presumption.

Courts are grappling with two apparently contradictory principles. First, the principle that a patentee may refuse to sell or license its patented products to a third party, and second, the principle that a patentee may not use the patent to extend its monopoly into adjacent markets, such as aftermarket. Even if the patentee cannot be forced to license or sell its products, it cannot take steps that make it unreasonably and unjustifiably difficult for an aftermarket competitor to make and sell compatible, non-infringing products. This raises the issue of design changes that prevent the use of a competitor's replacement parts in the patentee's product.

C. Interface Design Changes

One issue in the IBM plug-compatible peripheral antitrust lawsuits was the plaintiffs' challenges to IBM's interface design changes. As discussed above, a monopolist in market A might seek to control market B, which is an aftermarket for its products, by making changes in the design of its product A, thereby making it more difficult, if not impossible, for its competitors to produce complementary products in market B. The courts have alternatively condemned and condoned this

103. *See id.* at 1325.

104. *Id.* at 1327 (citing *Atari Games Corp. v. Nintendo of Am., Inc.*, 897 F.2d 1572, 1576 (Fed. Cir. 1990) (“[A] patent owner may not take the property right granted by a patent and use it to extend his power in the marketplace improperly, i.e., beyond the limits of what Congress intended to give in the patent laws.”)).

105. 125 F.3d at 1219.

practice on antitrust grounds.¹⁰⁶

In *GAF Corp. v. Eastman Kodak Co.*, the plaintiff competed with Kodak in the amateur film developing and print photography markets.¹⁰⁷ The plaintiff contended that from 1955 to 1972, an independent photofinishing network of small labs arose that developed film using Kodak C-22 chemistry and photofinishers that printed Kodacolor film.¹⁰⁸ As soon as plaintiff and other competitors gained a foothold in the market for C-22 color film developing and photofinishing, Kodak introduced new formulas that used new chemical reactions to develop the film.¹⁰⁹ The plaintiff alleged that Kodak's conduct forced independent photofinishers to convert from the old C-22 processing to the new Kodak C-41 processing.¹¹⁰ Plaintiff and other independent film suppliers were excluded from the market as a result.¹¹¹ Kodak argued that it possessed a nearly unfettered right to introduce new products, but the court disagreed, citing both *Berkey Photo* and *Northeastern Telephone* as clearly "contrary to Kodak's contentions, that new product introductions by a monopolist are not *ipso facto* immune from antitrust scrutiny" and that a "new product introduction coupled with some associated conduct may constitute a [Sherman Act] § 2 violation."¹¹²

The court found that Kodak could be held liable.¹¹³ Explaining its adoption of the reasoning in *Northeastern Telephone*,¹¹⁴ the court stated:

[I]n scrutinizing design conduct, § 2 would merely require the monopolist's design to be "reasonable," rather than to be the design alternative least restrictive of competition. Thus, the "reasonableness" of the design of a monopolist's new products (vis-a-vis competitors' products which were technically linked to or dependent upon the monopolist's product) may be scrutinized under § 2 in cases in which "market forces cannot operate" – that is, in cases in which a single firm controls the entire market or in which a monopolist engages in coercive conduct to affect consumer choice.¹¹⁵

Where a monopolist in market A owes his monopoly to a patent, it follows that "market forces cannot operate" and a monopolist could be

106. See, e.g., *C.R. Bard*, 157 F.3d 1340; *Medronic MiniMed Inc.*, 371 F. Supp. 2d 578; *GAF Corp. v. Eastman Kodak Co.*, 519 F. Supp. 1203 (S.D.N.Y. 1981).

107. *GAF v. Kodak*, 519 F. Supp. 1203.

108. *Id.* at 1224.

109. See *id.*

110. *Id.* at 1224-25.

111. See *id.*

112. *Id.* at 1226.

113. *GAF v. Kodak*, 519 F. Supp. at 1226.

114. *Ne. Tel. Co.*, 651 F.2d 76.

115. *GAF v. Kodak*, 519 F. Supp. at 1228.

found to engage in coercive conduct affecting consumer choice by re-designing products to exclude competitors from market B.

Two recent cases have considered the antitrust implications of patents and re-designed products.¹¹⁶ In *C.R. Bard, Inc. v. M3 Systems, Inc.*, a patent holder sued a competitor for infringing patents covering biopsy guns that mechanically injected a needle into the patient's body.¹¹⁷ Both the biopsy guns and the replacement needles were the subjects of patents.¹¹⁸ In the infringement suit, the competitor claimed that the patent holder had modified its patented biopsy guns and needles for the purpose of preventing the competitor's replacement needles from fitting the gun without an adapter.¹¹⁹ The Federal Circuit affirmed the district court's decision that the patent holder unlawfully maintained its monopoly position in the aftermarket for replacement needles by exclusionary conduct, i.e., by modifying its patented gun in order to prevent the replacement needles of its competitors from fitting in them.¹²⁰ The Federal Circuit's holding implies that the patent holder violated antitrust law by manipulating the interface between the patented biopsy guns and the replacement needles in order to control competition in the aftermarket for replacement needles.¹²¹

In another medical device case, *Medtronic MiniMed Inc. v. Smiths Medical MD Inc.*,¹²² MiniMed brought an action for infringement against Smiths for its sale of infusion pumps used to deliver insulin to diabetics, and the associated infusion "sets" that connected to the pumps.¹²³ The infusion pumps were durable goods that lasted many years, while the infusion sets were disposable and thrown out after a few days.¹²⁴ Smiths brought a counterclaim for antitrust violations, alleging that MiniMed had attempted to monopolize the market for infusion sets by redesigning and patenting a lock that acted as a physical interface between the infusion pumps and the infusion sets.¹²⁵ Smiths claimed it

116. *C.R. Bard*, 157 F.3d 1340; *Medtronic MiniMed Inc.*, 371 F. Supp. 2d 578.

117. *C.R. Bard*, 157 F.3d 1340.

118. *Id.* at 1359.

119. *Id.* at 1369.

120. *See id.* at 1381-83.

121. *Id.* at 1382-83; *see also* *Xerox Corp. v. Media Scis. Int'l, Inc.*, 511 F. Supp. 2d 372, 389 (S.D.N.Y. 2007) (holding that aftermarket competitor stated a claim for monopolization of market for replacement color ink sticks for plaintiff's color printers by redesigning printers to exclude aftermarket sellers of ink sticks from the market); *cf.* *HDC Med., Inc. v. Minntech Corp.*, 474 F.3d 543, 550 (8th Cir. 2007) (involving alleged design changes to dialysis equipment where antitrust plaintiff offered evidence of a substantial price differential to show that single-use dialyzers were a distinct product market from multi-use dialyzers and thus, successfully overcame defendant's motion to dismiss).

122. *Medtronic MiniMed Inc.*, 371 F. Supp. 2d 578.

123. *Id.* at 581.

124. *Id.*

125. *Id.*

had not produced new infusion sets compatible with the new lock because MiniMed held a patent on the new lock and Smiths was thus apprehensive about getting sued.¹²⁶ The court rejected Smiths' claims on the basis of standing because Smiths had not suffered an antitrust injury.¹²⁷ The court found that MiniMed had not sued any other competitor for infringement of its patent on the new lock, and therefore, until Smiths produced and sold infusion sets that were compatible with MiniMed's redesigned infusion pumps, it did not have standing to sue for antitrust violations.¹²⁸ The court also found that Smiths had failed to allege a claim for tying, because it had not adequately alleged that customers were coerced into buying MiniMed's infusion sets.¹²⁹ In the course of reaching its decision, the court rejected Smiths' claim that MiniMed had a duty to assist it: "Smiths argues that the design changes to the connection system undertaken by MiniMed could have been accomplished without removing the luer lock. Absent evidence of anticompetitive conduct, however, it is not the role of the courts to determine how companies should innovate."¹³⁰

The *Bard* court felt that judges and juries are competent to second-guess a patent holder's design decisions and expressed skepticism at the patent holder's design changes, especially when the purpose of the change appeared to be to exclude competition in the market for replacement needles.¹³¹ By contrast, the court in *Medtronic* expressed skepticism about the competence of judges and juries to use antitrust law to regulate perceived product innovations.¹³² As shown by these two cases, courts disagree on the ability of judges and juries to make the proper delineation between patents and antitrust. At the same time, courts are reluctant to give antitrust immunity to patent holders when they leverage market power in adjacent markets. Courts should be willing to use the antitrust laws to analyze the economic effects of company A modifying its product to exclude competitors in an adjacent market B, because of the threat of an overall loss of consumer surplus and unjustifiably higher prices for consumers of B-type products.

D. Changes in Drug Formulas

For nearly every successful patented product, there exists a prospective future market for copycat, complementary, or generic

126. *Id.* at 583-84.

127. *See id.* at 584.

128. *Medtronic MiniMed Inc.*, 371 F. Supp. 2d at 584.

129. *See id.* at 584-86 & n.8.

130. *Id.* at 589 (citation omitted).

131. *C.R. Bard*, 157 F.3d at 1382.

132. *Medtronic MiniMed Inc.*, 371 F. Supp. 2d at 588.

products that a competitor will produce and sell upon expiration of the patent, at a lower price charged by the patent holder. The patent holder will often attempt to lawfully extend its monopoly to exclude these potential competitors by making slight, but patentable, design changes in the original product. A competitor claiming that the patent holder is changing its product to prevent the competitor from introducing a generic substitute is entitled to proceed with a complaint, according to *Abbott Laboratories v. Teva Pharmaceuticals*.¹³³

In *Abbott Laboratories v. Teva Pharmaceuticals*, a generic drug manufacturer alleged that the branded drug manufacturer intentionally made a series of insignificant changes to its drug as a way to keep the generic manufacturer from successfully obtaining Food and Drug Administration approval to sell the generic version and successfully market it to buyers.¹³⁴ The court analogized to other adjacent market cases to determine that if the allegations were true, the defendant had altered the functioning of the marketplace.¹³⁵ In doing, the patent holder reduced consumer choice for drugs by manipulating the laws governing sales and marketing of generic drugs, as part of a scheme to extend its monopoly into the future.¹³⁶ By repeatedly shifting the formula of its drug, the branded drug manufacturer allegedly prevented its generic drug competitors from publishing their competing drugs in the "Orange Book" where information about approved generic drugs is disseminated to the market.¹³⁷ Applying the rule of reason, the court permitted the generic competitors to proceed with their complaint, which enabled the court to conduct an inquiry into the costs and benefits of the defendant's conduct.¹³⁸

133. *Abbot Labs. v. Teva Pharm. USA, Inc.*, 432 F. Supp. 2d 408 (D. Del. 2006).

134. *See id.* at 414.

135. *See id.* at 420-22.

136. *See id.* at 424 ("By removing the old products from the market and changing the NDDF code, Defendants allegedly suppressed competition by blocking the introduction of generic fenofibrate.").

137. After approval of a drug by the Food and Drug Administration ("FDA"), information about the branded drug, including patent information, is published by the FDA in a publication entitled "Approved Drug Products with Therapeutic Equivalence Evaluations," which is generally called the "Orange Book," after the color of its cover. *Teva*, 432 F. Supp. 2d at 414. Under the Hatch-Waxman Act, 21 U.S.C. §§ 355, 360cc (2006) and 35 U.S.C. §§ 156, 271, 282, generic versions of previously approved branded drugs may be submitted for approval by the FDA as "bioequivalent" to the branded drug by submitting an Abbreviated New Drug Application ("ANDA") to the FDA. 21 U.S.C. § 355(j); *Teva*, 432 F. Supp. 2d at 414. When seeking FDA approval, the generic manufacturer must also certify and give notice that its drug will not infringe any patents listed for the branded drug in the Orange Book. *Id.* The branded drug manufacturer then has forty-five days in which to file an infringement suit. *Id.* at 415. If the generic manufacturer is successful in the infringement suit, a pharmacist can substitute the bioequivalent generic drug for any branded drug prescribed by a physician and listed in the Orange Book. *Id.*

138. *Id.* at 422.

Like the cases where a defendant of a durable good or software manipulates the interface or interconnection to extend its patent beyond the four corners of its original grant to block potential entrants to its market, the drug manufacturer allegedly changed the design of its branded drug in order to prevent generic manufacturers from establishing their fitness as substitutes for the branded drug. This alleged misuse of the patent and U.S. drug laws could not have been foreseen by a patent examiner. There is no economic principle that would grant company A under these circumstances any power in market B, since company A was already reaping the rewards of innovation conferred by the patent laws. The court appropriately examined the particular market and applied the antitrust laws to determine whether company A was unlawfully leveraging the patent monopoly in product A into market B.

CONCLUSION

This Article examined the intersection and potential conflict of patents and antitrust. Patents grant monopolies of limited duration that may result in the patent holder having monopoly or market power in one or more antitrust markets. We discussed cases where a patent holder uses such market or monopoly power in the market for a patented product to exclude competitors in an adjacent market and/or attempts to monopolize or monopolizes the adjacent market. We discussed the role that interfaces connecting the patent grant market with an adjacent market play in leveraging market power. Economic theory suggests that it is inappropriate to immunize a patent holder from antitrust liability when it attempts to extend its patent monopoly into adjacent markets, because it could decrease consumer surplus. Generally, courts have been reluctant to examine in detail a patent holder's innovations and design changes. However, applying antitrust law, courts have found that monopolists may be liable for unlawfully extending their monopolies into adjacent markets in the areas of computer peripherals and software applications; aftermarket for replacement parts, service and maintenance of durable goods; design changes to medical devices; and changes in drug formulas. Although the boundary between patents and antitrust is not clearly delineated, the courts are nonetheless reluctant to give antitrust immunity to patent holders when they leverage market power in adjacent markets.