

PATENT TYING, PRICE DISCRIMINATION, AND INNOVATION

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Patent law is the cornerstone of American innovation policy. The relationship between patents and innovation, however, is more complicated than the simple explanation that patents reward innovators. Patent holders sometimes engage in conduct that can reduce innovation. This article examines one type of such conduct: tying arrangements. Patentees sometimes employ tying arrangements as a metering device to effect price discrimination. While some commentators would justify patent tying as pro-innovation because it increases the rewards to the patentee, in this article I argue that metered tying can diminish incentives to innovate and, consequently, antitrust law should not recognize a price discrimination defense to patent tying.

Patent law encourages innovation by granting exclusionary rights to patent holders.¹ Patentees are able to prevent competitors from manufacturing and selling infringing products. Absent these exclusionary rights, rival firms could copy inventions and sell them at a lower price because they would not have to recoup the research money invested by the actual innovator.² A truly free market without patent protection would result in an underinvestment in research and less innovation.³ Armed with the ability to exclude infringing competitors

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¹ *Kewanee Oil Co. v. Bicron Corp.*, 416 U.S. 470, 480 (1974) (“The patent laws . . . offer[] a right of exclusion for a limited period as an incentive to inventors to risk the often enormous costs in terms of time, research, and development. The productive effort thereby fostered will have a positive effect on society through the introduction of new products and processes of manufacture into the economy . . .”).

² See Gideon Parchomovsky & Peter Siegelman, *Towards an Integrated Theory of Intellectual Property*, 88 VA. L. REV. 1455, 1467 (2002).

³ JAMES BESSEN & MICHAEL J. MEURER, *PATENT FAILURE* 216 (2008) (“In economic theory, patents can play a critical role by providing incentives for inventors to invest in R&D and other innovative effort. Markets alone do not necessarily provide a socially optimal level of incentives

from the market, however, the inventor with a valuable patent is able to charge a supracompetitive price in order to recoup its investment and earn a profit as a reward for its innovation.⁴ Thus, exclusionary rights provide the basis for the monetary incentive for inventors to innovate⁵ and to commercialize and license their ideas.⁶ All of this increases innovation because if inventors cannot recoup and profit from their investments in research and development, then innovators will shift their attention and assets elsewhere.

While these exclusionary rights increase innovation, they also impose inefficiency on the marketplace. Like any firm with sufficient market power, the patentee with a valuable patent maximizes its profits by increasing price while decreasing output. Consumers who would pay the competitive price for the patented product, but not the supracompetitive price charged by the patentee, are excluded from the market. This creates inefficiency in the form of deadweight loss. Sales that should occur in an efficient market—because the consumers value the good more than it costs to make it—do not occur. Rival firms cannot supply this unmet demand because doing so would constitute infringement. As a result, one residual effect of our patent system is inefficiency.

This deadweight loss is seen as a reasonable cost for the innovation that patent policy encourages. Because the deadweight loss is in the short term and the increased innovation is in the long term, scholars argue that the dynamic efficiency associated with the patent system outweighs the static inefficiency.⁷ Even if this inefficiency is acceptable on balance, reducing the amount of deadweight loss associated with the patent system is nonetheless desirable. The patent system addresses this, in part, by limiting patent scope and duration.⁸

Scholars have advanced many proposals to eliminate the deadweight loss attendant to the patent system. Some scholars advocate replacing the traditional patent regime with a reward system in which inventions enter the public domain immediately and successful inventors earn cash prizes for their cre-

(Arrow 1962), and so patents are seen as an important policy instrument to remedy this market failure.”)

⁴ See Christopher A. Cotropia, *Modernizing Patent Law's Inequitable Conduct Doctrine*, 24 BERKELEY TECH. L.J. 723, 761 (2009).

⁵ DAN L. BURK & MARK A. LEMLEY, *THE PATENT CRISIS AND HOW THE COURTS CAN SOLVE IT* 37 (2009) (“There is virtually unanimous agreement that the purpose of the patent system is to promote innovation by granting exclusive rights to encourage invention.”).

⁶ BESSEN & MEURER, *supra* note 3, at 76.

⁷ Michael Abramowicz, *Perfecting Patent Prizes*, 56 VAND. L. REV. 115, 129 (2003).

⁸ 1 HERBERT HOVENKAMP, MARK D. JANIS, MARK A. LEMLEY & CHRISTOPHER R. LESLIE, *IP AND ANTITRUST: AN ANALYSIS OF ANTITRUST PRINCIPLES APPLIED TO INTELLECTUAL PROPERTY* § 1.2, at 1–10 (2d ed. 2009).

ations.⁹ Patent prizes that leave the market forces in place are seen as a way to encourage invention while avoiding deadweight loss.¹⁰ Other proposals target particular subsets of patented products. For example, Doug Lichtman has argued that the government should subsidize purchases of patented pharmaceuticals for consumers who value the good more than its marginal cost but cannot pay the supracompetitive price charged by the patent holder.¹¹ Other scholars advocate greater enforcement of rules that those patented inventions whose research was federally funded be sold at reasonable prices.¹²

One approach to minimizing deadweight loss is price discrimination by patentees.¹³ Through price discrimination, the shrewd seller attempts to discern the individual reservation price—the highest price that a buyer is willing to pay—for each consumer. If the seller can successfully charge a different price to each customer—equal to that customer’s reservation price—the seller has engaged in perfect price discrimination. Because price discrimination allows the seller to charge a high price to high-value consumers and a low price to low-value consumers, a monopolist that price discriminates perfectly can expand output and produce the same quantity as a competitive market.¹⁴ Thus, if a patentee can perfectly price discriminate, this can eliminate the deadweight loss associated with the pricing of patented goods.¹⁵

⁹ F. Scott Kieff, *Property Rights and Property Rules for Commercializing Inventions*, 85 MINN. L. REV. 697, 705–06 (2001) (discussing Steven Shavell & Tanguy van Ypersele, *Rewards versus Intellectual Property Rights* (Nat’l Bureau of Econ. Research Working Paper No. 6956 (1999))); Michael Kremer, *Patent Buy-Outs: A Mechanism for Encouraging Innovation* (Nat’l Bureau of Econ. Res., Working Paper No. 6304 (1997)). Different scholars propose varying means of valuing inventions. *See id.* at 706–07.

¹⁰ *See* SUZANNE SCOTCHMER, INNOVATION AND INCENTIVES 39 (2004) (“The advantage of prizes over patents is that they can avoid the deadweight loss of proprietary pricing.”); Abramowicz, *supra* note 7, at 235 (“Proponents of patent prizes have sought to avoid the deadweight losses associated with intellectual property protection by recommending that a centralized governmental spending program replace a market-based incentive.”); *but see* Kieff, *supra* note 9 (arguing that a patent-prize system may provide insufficient incentive for inventors to commercialize their inventions).

¹¹ Douglas Gary Lichtman, *Pricing Prozac: Why the Government Should Subsidize the Purchase of Patented Pharmaceuticals*, 11 HARV. J.L. & TECH. 123, 124–25 (1997).

¹² *See generally* Peter S. Arno & Michael H. Davis, *Why Don’t We Enforce Existing Drug Price Controls? The Unrecognized and Unenforced Reasonable Pricing Requirements Imposed upon Patents Deriving in Whole or in Part from Federally Funded Research*, 75 TUL. L. REV. 631 (2001).

¹³ SCOTCHMER, *supra* note 10, at 37 (“Deadweight loss is the main defect of intellectual property as an incentive mechanism. However, there is an important caveat to this argument, namely, price discrimination. The deadweight loss imposed by a monopolist can be mitigated, and possibly eliminated, if the monopolist can discriminate on price.”).

¹⁴ J. Gregory Sidak, *Rethinking Antitrust Damages*, 33 STAN. L. REV. 329, 334 (1981); *see also* Alan O. Sykes, *TRIPS Pharmaceuticals, Developing Countries, and the Doha “Solution,”* 3 CHI. J. INT’L L. 47, 63 (2002).

¹⁵ Kieff, *supra* note 9, at 727.

Sellers can attempt price discrimination in a variety of ways. For example, instead of differentiating individual reservation prices, sellers may charge different prices to different categories of consumers.¹⁶ Some firms charge different prices in different countries or regions.¹⁷ Others may charge their government customers one price and private buyers another. Examples of price discrimination strategies involving copyrighted works include selling expensive hardcover versions of a book months before releasing a cheaper paperback version.

One way for patent holders to price discriminate is to use metered tying. A tying arrangement exists when a patentee refuses to sell its patented product—or license its patent—unless the buyer or licensee agrees to purchase a second product from the patentee. The patented product is the tying product and the second product (whose purchase is compelled) is the tied product. In a metered tying situation, the tied product is a complementary product that is consumed as the patented tying product is used. For example, suppose that a seller of patented copying machines has two potential customers, a law firm willing to pay \$2000 and a real estate office willing to pay \$1000. Metered tying is based on the premise that those consumers with higher reservation prices are likely to be the higher-intensity users.¹⁸ The seller charges a supracompetitive price for the tied product—the ink or paper used in the copier—and the subsequent purchases of the tied product measure the intensity of use of the tying product. Because the tied product is supracompetitively priced, high-volume users are effectively charged a higher price for the tying product.¹⁹

¹⁶ See Michael J. Meurer, *Vertical Restraints and Intellectual Property Law: Beyond Antitrust*, 87 MINN. L. REV. 1871, 1877 (2003) (“In markets protected by IP, sellers often segment their buyers based on line of business, location, field of technology, or whether the use is not-for-profit.”).

¹⁷ See Sykes, *supra* note 14, at 64 (discussing price discrimination by pharmaceutical companies).

¹⁸ Meurer, *supra* note 16, at 1889 (“Buyers who use a product more frequently are likely to have a higher valuation and be willing to pay more.”).

¹⁹ RICHARD A. POSNER, *ANTITRUST LAW* 199–200 (2d ed. 2001); M.L. Burstein, *A Theory of Full-Line Forcing*, 55 NW. U. L. REV. 62, 64–65 (1960) (“Thus, punch cards have been tied to computers, steel strapping to applying machines, cans to can-closing machinery, repair parts to automobiles, staples to stapling machines, toilet paper to dispensers, mimeograph supplies to mimeograph machines, rivets to riveting machines, etc. We see that the tied good in these cases serves very much as a counting or metering device; the tying arrangement results in streams of payments flowing from the users of the machine to its seller (or lessor) with the rates of flow being directly proportional to the intensity of use of the machine. Those using the machine more intensively are paying more; price discrimination is being achieved.”); Henry N. Butler, W.J. Lane & Owen R. Phillips, *The Futility of Antitrust Attacks on Tie-In Sales: An Economic and Legal Analysis*, 36 HASTINGS L.J. 173, 190 (1984); see also Robert S. Hansen & R. Blaine Roberts, *Metered Tying Arrangements, Allocative Efficiency and Price Discrimination*, 47 S. ECON. J. 73 (1980); Benjamin Klein & John Shepard Wiley Jr., *Competitive Price Discrimination as an Antitrust Justification for Intellectual Property Refusals to Deal*, 70 ANTITRUST L.J.

Metered tying, however, raises two potential legal problems. First, tying arrangements may constitute patent misuse. This provides a defense against infringement charges until the misuse is purged.²⁰ Second, tying may violate antitrust laws. This provides an affirmative cause of action against the patentee.

Antitrust's condemnation of tying arrangements arose in the context of patent tying. In *Henry v. A.B. Dick Co.*,²¹ the seller of a patented mimeograph imposed a contract term that its machine "may be used only with the stencil, paper, ink and other supplies made by A.B. Dick Co."²² The Court held that use of a competitor's ink constituted infringement of the patented machine, despite the fact that the ink was unpatented.²³ Two years later, Congress repudiated *A.B. Dick* with the enactment of Section 3 of the Clayton Act, which condemns tying arrangements whose effect "may be to substantially lessen competition or tend to create a monopoly in any line of commerce."²⁴ Soon thereafter, the Court in *Motion Picture Patents Co. v. Universal Film Mfg. Co.*²⁵ noted that, because of the congressional enactment, *A.B. Dick* "must be regarded as overruled."²⁶ The following year, the Court held that tying arrangements could also violate the Sherman Act.²⁷

Antitrust's rule against tying is based on leverage theory, which was first articulated by the Supreme Court in Chief Justice White's dissent in *A.B. Dick*.²⁸ Leverage theory argues that a monopolist in the tying product market will employ a tie-in to expand its monopoly power into the tied product market.²⁹ After the passage of the Clayton Act, leverage theory gained traction. The *Kodak* majority noted that "[t]he Court has held many times that power gained through some natural and legal advantage such as a patent, copyright,

599, 604–05 (2003) ("If buyers that use a machine more intensively generally have higher consumer surpluses on the package than buyers that use a machine less intensively, then an aftermarket pricing upcharge is a way to charge higher package prices to relatively high-value buyers while charging lower overall prices to relatively low-value buyers.").

²⁰ See *Minebea Co., Ltd. v. Papst*, 444 F. Supp. 2d 68, 209 (D.D.C. 2006) ("Patent misuse is an equitable defense against patent infringement; it renders the patent unenforceable until the misuse is cured and thus provides a temporary defense.").

²¹ 224 U.S. 1 (1912).

²² *Id.* at 25–26.

²³ *Id.*

²⁴ 15 U.S.C. § 14.

²⁵ 243 U.S. 502 (1917).

²⁶ *Id.* at 518.

²⁷ *United States v. United Shoe Mach. Co.*, 247 U.S. 32 (1918).

²⁸ White condemned the patentee's tying requirement as an "attempt to increase the scope of the monopoly granted by a patent . . . which tend[s] to increase monopoly and to burden the public in the exercise of their common rights." 224 U.S. at 70 (White, J., dissenting).

²⁹ Christopher R. Leslie, *Cutting Through Tying Theory with Occam's Razor: A Simple Explanation of Tying Arrangements*, 78 TUL. L. REV. 727, 732 (2004) [hereinafter *Tying Arrangements*].

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.”³⁰ Even if the original monopoly in the tying product market is legal, leverage theory argues that using that monopoly to restrain competition in the market for the tied product violates the antitrust laws.³¹

Scholars, particularly those associated with the Chicago School, responded that firms do not engage in tying in order to monopolize the tied product market. Rather, firms may impose tie-ins for other reasons, such as price discrimination. Scholars view many of the tying arrangements involving patented products discussed in the Supreme Court’s antitrust jurisprudence as examples of price discrimination through metering, including *A.B. Dick*,³² *Motion*

³⁰ *Eastman Kodak Co. v. Image Tech. Servs., Inc.*, 504 U.S. 451, 479 n.29 (1992) (quoting *Times-Picayune Publ’g Co. v. United States*, 345 U.S. 594, 611 (1953)); *see also* *Image Tech. Servs., Inc. v. Eastman Kodak Co.*, 125 F.3d 1195, 1216 (9th Cir. 1997) (“[A] monopolist who acquires a dominant position in one market through patents and copyrights may violate § 2 if the monopolist exploits that dominant position to enhance a monopoly in another market.”).

³¹ *Jefferson Parish Hosp. Dist. No. 2 v. Hyde*, 466 U.S. 2, 16 (1984) (“Any effort to enlarge the scope of the patent monopoly by using the market power it confers to restrain competition in the market for a second product will undermine competition on the merits in that second market. Thus, the sale or lease of a patented item on condition that the buyer make all his purchases of a separate tied product from the patentee is unlawful.”).

³² *Henry v. A.B. Dick Co.*, 224 U.S. 1 (1912); *see* Richard A. Posner, *Transaction Costs and Antitrust Concerns in the Licensing of Intellectual Property*, 4 J. MARSHALL REV. INTELL. PROP. L. 325, 330 (2005) (“Requiring licensees to buy the ink from Dick enabled Dick to vary the effective price the licensees paid for the machine according to the licensees’ elasticity of demand, as proxied by the amount of ink they consumed.”); HERBERT HOVENKAMP, *THE ANTI-TRUST ENTERPRISE: PRINCIPLES AND EXECUTION* 262 (2005) (“Many patent ties are in fact price discrimination devices, and when used for this purpose most are competitively benign. For example, by tying ink to its mimeograph machine A. B. Dick took advantage of the fact that high-intensity users valued the machine more highly than low-intensity users. A.B. Dick then put a substantial portion of its markup in the ink rather than the machine and was able to obtain differential returns from users based on the volume of ink they consumed.”).

Picture Patents,³³ *IBM*,³⁴ *Kodak*,³⁵ and *Illinois Tool Works*,³⁶ among others.³⁷ The Supreme Court has explicitly recognized the possibility of using tying arrangements to effect price discrimination.³⁸

Some commentators and judges have suggested that the price discrimination explanation for tying arrangements should provide a defense when patent holders are accused of violating antitrust laws by imposing a metering tie-in. Because tying arrangements represent a form of price discrimination, the argument goes, antitrust should not condemn patent tying. The thrust of this argument is that price discrimination by patentees facilitates innovation and efficiency.

³³ *Motion Picture Patents Co. v. Universal Film Mfg.*, 243 U.S. 502 (1917); see Meurer, *supra* note 16, at 1891 n.112 (“The same type of price discrimination was practiced in *Motion Picture Patents Co. v. Universal Film Mfg.*, 243 U.S. 502 (1917). Movie projectors were tied to film, and the patent owner derived most of its profit from the sale of film.”).

³⁴ *IBM Corp. v. United States*, 298 U.S. 131 (1936); see Meurer, *supra* note 16, at 1891 (describing *IBM* as a “classic illustration of contractual tying and price discrimination”); Dennis W. Carlton & Michael Waldman, *The Strategic Use of Tying to Preserve and Create Market Power in Evolving Industries*, 33 RAND J. ECON. 194, 195 (2002) (Price discrimination through metered tying “is the standard interpretation for why IBM required consumers of its machines to also purchase cards from IBM.”).

³⁵ *Eastman Kodak Co. v. Image Tech. Servs., Inc.*, 504 U.S. 451 (1992); see Klein & Wiley, *supra* note 19, at 601–02 (describing the “aftermarket metering used by Kodak” as one of “many [] examples of economic price discrimination”).

³⁶ *Illinois Tool Works Inc. v. Indep. Ink, Inc.*, 547 U.S. 28 (2006); see Joshua D. Wright, *Missed Opportunities in Independent Ink*, 2005–06 CATO SUP. CT. REV. 333, 335 (“*Independent Ink* involves a classic example of a metering tie.”).

³⁷ Warren S. Grimes & Lawrence A. Sullivan, *Illinois Tool Works, Inc. v. Independent Ink, Inc.: Requirements Tie-Ins and Intellectual Property*, 13 SW. J.L. & TRADE AMERICAS 335, 344 (2007) (noting that *Int’l Salt Co. v. United States*, 332 U.S. 392 (1947); *IBM Corp. v. United States*, 298 U.S. 131 (1936); *United Shoe Mach. Co. v. United States*, 258 U.S. 451 (1922); and *Motion Picture Patents Co. v. Universal Film Mfg. Co.*, 243 U.S. 502 (1917), may have involved potential metering). However, the Supreme Court recognized in *Illinois Tool Works* that *International Salt* probably did not represent an instance of metering: “[T]he requirements tie in that case did not involve any price discrimination between large volume and small volume purchasers or evidence of noncompetitive pricing. Instead, the leases at issue provided that if any competitor offered salt, the tied product, at a lower price, ‘the lessee should be free to buy in the open market, unless appellant would furnish the salt at an equal price.’” *Illinois Tool Works*, 547 U.S. at 44 (quoting *International Salt*, 332 U.S. at 396).

³⁸ *Jefferson Parish Hosp. Dist. No. 2 v. Hyde*, 466 U.S. 2, 19 n.30 (1984) (“In fact, in some situations the functional link between the two items may enable the seller to maximize its monopoly return on the tying item as a means of charging a higher rent or purchase price to a larger user of the tying item.”); *id.* at 36 n.4 (1984) (O’Connor, J., concurring in the judgment) (“Tying may also help the seller engage in price discrimination by ‘metering’ the buyer’s use of the tying product.”); *Hirsh v. Martindale-Hubbell, Inc.*, 674 F.2d 1343, 1349 (9th Cir. 1982) (“Where the quantity of sales of the tied product operates as a measure of the buyer’s intensity of use of the tying product, the seller may exact a premium from the more intensive users by charging supracompetitive prices for the tied product.”).

This article deals with the argument that price discrimination through patent tying encourages innovation.³⁹ In particular, it reviews the innovation arguments made in favor of patent tying; critiques these arguments by explaining how metered tying is not necessarily an appropriate mechanism for rewarding and funding research efforts; explains how patent tying can reduce the incentives for innovation in the tied product market; and discusses how antitrust law should treat patent tying in light of the impact that such tying may have on incentives to innovate.

I. PRICE DISCRIMINATION AS A DEFENSE TO PATENT TYING CLAIMS

The price discrimination theory of tying arrangements is both descriptive and prescriptive. Those who advance this theory argue that tie-ins are best understood as a mechanism to price discriminate, not to leverage market power across markets. The theory then shifts from explaining tie-ins to exonerating them. Because price discrimination is seen as efficient, and because tying cannot injure competition according to these theorists,⁴⁰ antitrust law should not condemn tie-ins.⁴¹ In the context of patent tying, these theorists make an additional innovation defense of tying. This Part presents that argument.

A. PATENT TYING AND INNOVATION

Advocates of patent tying argue that patentees should be able to tie because it facilitates price discrimination,⁴² which increases profits and returns to inventors and thus encourages innovation. Ward Bowman is generally credited with developing the argument that, to the extent that price discrimination increases the innovator's reward, patentees should be permitted to employ metered tying because it increases the incentive to innovate.⁴³ Under this view, patent tying is justified even if it restrains competition because "it may in-

³⁹ I address the efficiency arguments in a separate article. See Christopher R. Leslie, *Metered Tying, Price Discrimination and Efficiency* (forthcoming) [hereinafter *Metered Tying*] (critiquing the argument that metered tying necessarily expands output of the tying product).

⁴⁰ ROBERT BORK, *ANTITRUST PARADOX* 367 (1978).

⁴¹ While some commentators see price discrimination as a reason to exonerate tying arrangements, other scholars view price discrimination as a reason to condemn tying arrangements. See Grimes & Sullivan, *supra* note 37, at 342–54.

⁴² When I use the term "patent tying" in this article, I am referring to metered tying by a patentee, not one-to-one bundling.

⁴³ WARD BOWMAN, JR., *PATENT AND ANTITRUST LAW* 112 (1973); see Louis Kaplow, *The Patent-Antitrust Intersection: A Reappraisal*, 97 HARV. L. REV. 1813, 1874 (1984) (discussing Bowman's theory); Meurer, *supra* note 16, at 1875 (2003) (citing BOWMAN, *supra*, at 64); Grimes & Sullivan, *supra* note 37, at 351 ("Proponents of maximum exploitation of IP rights argue that the increased revenues achieved through tying a patented product to an unpatented product provide a desirable increased incentive for innovation.").

crease the licensor's reward and thereby enhance the incentive for innovation."⁴⁴

Picking up Bowman's mantle, Benjamin Klein and John Shepard Wiley, Jr. argue that "price discrimination, because it efficiently encourages increased investments in innovation, is efficiency-enhancing."⁴⁵ In addition to rewarding traditional investments in innovation, Joshua Wright argues that metered tying also provides incentives for "other competitive investments such as increasing product variety, expanding retail outlets, or research and development."⁴⁶ Sometimes accompanying these innovation arguments is a species of fairness argument that it is permissible for the patentee to extract this greater reward through metered tying because it reflects the social value of the invention.⁴⁷ If patentees cannot realize all of the social gains created by their inventions, the argument goes, then innovators may underinvest in research.⁴⁸ Indeed, some commentators have gone so far as to argue that price discrimination is necessary to create the proper level of rewards for inventors.⁴⁹

More recently, the arguments in *Illinois Tool Works* invoked the innovation-based defense of tying arrangements. Although the Supreme Court was deciding the limited issue of whether tying sellers should be presumed to possess market power when their tying product is patented, many of the arguments made against the presumption were actually calls for greater deference to patent tying more broadly, in the name of rewarding innovation. Some advocates tried to draw a link between the presumption and innovation. For example, the petitioner, Illinois Tool Works, argued that "[t]he presumption thus unjustifiably increases the costs of owning, disseminating and enforcing intellectual property through efficient contractual arrangements. These increased costs ultimately discourage firms from investing in the development

⁴⁴ JAY DRATLER, JR., LICENSING OF INTELLECTUAL PROPERTY § 7.06 (2005).

⁴⁵ Klein & Wiley, *supra* note 19, at 618; *see also* Meurer, *supra* note 16, at 1881 ("It is possible that patent law's greater solicitude for price discrimination is explained by the perception that the extra profit from price discrimination is especially valuable as an incentive to invent (specifically to invent pharmaceuticals, an industry that practices extensive price discrimination).").

⁴⁶ Wright, *supra* note 36, at 350.

⁴⁷ *See* Brian T. Grill, *The Treatment of Metering in Antitrust Law: The Supreme Court's Apparent Abolition of the Per Se Rule Against Metering in Illinois Tool Works, Inc. v. Independent Ink, Inc.*, 2006 WIS. L. REV. 1465, 1485 (2006) ("Thus, metering is desirable because it allows manufacturers to recover more of the social value of their inventions and leads to more invention and innovation, which in turn is likely to benefit consumers and society as a whole.").

⁴⁸ *Id.* at 1485.

⁴⁹ Klein & Wiley, *supra* note 19, at 617 (arguing that "innovation would not occur at all in competitive high-technology industries without price discrimination") (citing William J. Baumol & Daniel G. Swanson, *The New Economy and Ubiquitous Competitive Price Discrimination: Identifying Defensible Criteria of Market Power*, 70 ANTITRUST L.J. 661 (2003)).

of intellectual property in the first place.”⁵⁰ Amici, such as the ABA, agreed and claimed that “the market power presumption . . . unjustifiably reduces incentives to innovate.”⁵¹ Similarly, the Intellectual Property Law Association of Chicago asserted that “the antitrust presumption against patent owners who commercialize their inventions is effectively a penalty or disincentive to innovate or patent an innovation.”⁵²

Other amici went further and suggested that any antitrust restrictions on patent tying weaken innovation. For example, in its amicus brief, the New York Intellectual Property Law Association argued that Congress enacted Section 271(d)(5) of the Patent Code specifically to repudiate the Supreme Court anti-tying decisions, which, according to the NYIPLA, had “threaten[ed] the incentive to innovate” by making it harder for patentees to impose tie-ins.⁵³ Similarly, the United States as amicus defended patent tying because “[r]educing the patentee’s options for efficient exploitation of its patent rights may . . . adversely impact the incentives to innovate.”⁵⁴ These legal advocates suggested that because metered tying increases the rewards to innovators, patentees should be able to impose tying arrangements on buyers and licensees.

Metered tying by patentees does not merely reward past innovation, according to price discrimination theorists, it funds future innovation. The transfer of wealth from consumers to producers inherent in price discrimination is rationalized as allowing the producers to recoup more of the value that they have created in order to reinvest it into future research efforts. For example, Klein and Wiley argue that “price discrimination allows producers to recoup more

⁵⁰ Brief for the Petitioners, *Illinois Tool Works v. Independent Ink, Inc.*, 547 U.S. 28 (2006) (No. 04-1329), 2005 WL 1864122, at *33 (Aug. 4, 2005); *see id.* at 33–34 (“Given intellectual property’s increasingly important role in our economy, such a disincentive could cause substantial long-run harm to our economy—to innovators, manufacturers and consumers alike.”).

⁵¹ Brief of the American Bar Association as Amicus Curiae in Support of Petitioners, *Illinois Tool Works v. Independent Ink, Inc.*, 547 U.S. 28 (2006) (No. 04-1329), 2005 WL 1864121, at *3 (Aug. 4, 2005); *see also id.* at 8 (“Because such presumptions are arbitrary, ignoring real world facts, they have no proper basis from the point of view of either intellectual property or antitrust law, and they lower incentives created by intellectual property law to invest in new jobs and new industrial facilities based on technical advances.”); *see also* Brief for the United States as Amicus Curiae Supporting Petitioners, *Illinois Tool Works v. Independent Ink, Inc.*, 547 U.S. 28 (2006) (No. 04-1329), 2005 WL 1864093, at *28 (Aug. 4, 2005) (“a market power presumption that undermines perceived rewards may constitute a drag on innovation”).

⁵² Brief Amicus Curiae of the Intellectual Property Law Association of Chicago in Support of Petitioners, *Illinois Tool Works v. Independent Ink, Inc.*, 547 U.S. 28 (2006) (No. 04-1329), 2005 WL 1801032, at *11 (Aug. 4, 2005).

⁵³ Brief of New York Intellectual Property Law Association as Amicus Curiae in Support of Petitioners, *Illinois Tool Works v. Independent Ink, Inc.*, 547 U.S. 28 (2006) (No. 04-1329), 2005 WL 1865481, at *19 (Aug. 4, 2005).

⁵⁴ Brief for the United States as Amicus Curiae Supporting Petitioners, *Illinois Tool Works v. Independent Ink, Inc.*, 547 U.S. 28 (2006) (No. 04-1329), 2005 WL 1864093, at *29.

of the social value of their innovations and thereby leads to more innovation.”⁵⁵ Further, they argue that through this innovation incentive, price discrimination—which is conventionally thought to deplete consumer surplus—benefits consumers because “any increased profit from price discrimination is passed on to consumers in the form of additional investments along whatever dimensions give the firm the ability to price above marginal cost and price discriminate.”⁵⁶ They suggest that tying sellers will devote the additional funds they secure through price discrimination to research product improvements, as well as to other activities, such as broadening their range of products and their number of retail outlets.⁵⁷ To the extent that consumers benefit from the investment in research and the resulting new products, this line of argument proposes that the buying public is a beneficiary of metered tying by patentees.

In sum, this school of thought argues that metered tying is justified as an efficient mechanism to price discriminate, to reward and fund innovators, and, consequently, to encourage innovation.⁵⁸

B. PATENT TYING AS A LEGITIMATE USE OF PATENTS

Those who favor patent tying as a means of price discrimination argue that metered tying represents a legitimate use of the patent. There is no general prohibition against patentees engaging in price discrimination. For example, price discrimination does not constitute patent misuse.⁵⁹ But the question remains whether the patentee should have a right to use tying arrangements to effect price discrimination. Judge Posner famously answered in the affirmative when he opined:

[T]here is nothing wrong with trying to make as much money as you can from a patent. True, a tie-in can be a method of price discrimination. It enables the patent owner to vary the amount he charges for the use of the patent by the intensity of each user’s demand for the patent (e.g., the mimeograph), as measured by the user’s consumption of the tied product (e.g., the ink). But since . . . there is no principle that patent owners may not engage in price discrimination, it is unclear why one form of discrimination, the tie-in, alone is forbidden.⁶⁰

⁵⁵ Klein & Wiley, *supra* note 19, at 619.

⁵⁶ *Id.* at 616–17.

⁵⁷ *Id.*

⁵⁸ Grill, *supra* note 47, at 1485–86.

⁵⁹ See Kara Moorcroft, *Scofflaw Science: Avoiding the Anticommons Through Ignorance*, 7 TUL. J. TECH. & INTELL. PROP. 71, 83 (2005) (“a patent holder is not liable for patent misuse for engaging in price discrimination”) (citing *USM Corp. v. SPS Techs., Inc.*, 694 F.2d 505, 510–11 (7th Cir. 1982)).

⁶⁰ *USM Corp.*, 694 F.2d at 511 (Posner, J.) (citing *Heaton-Peninsular Button-Fastener Co. v. Eureka Specialty Co.*, 77 F. 288, 296 (6th Cir. 1896); GEORGE STIGLER, *THE THEORY OF PRICE* 210–11 (3d ed. 1966); BOWMAN, *supra* note 43, at 55, 116–19.

Posner's lament embraced the thinking of Chicago School standard-bearer Ward Bowman, whom Posner cited. To justify why antitrust law should not condemn patent tying, Bowman drew a distinction between patentee conduct that maximized profits and conduct that expanded any monopoly power associated with the patent.⁶¹ For Bowman, when evaluating the intersection of antitrust law and patent rights, "the most pertinent question involves whether patentee-licensee agreements are profit-maximizing or are monopoly-extending."⁶² Conduct in the former category represented a legitimate use of the patent while conduct in the latter could be proscribed. The question then becomes which side of this line tying arrangements fall on. The founding fathers of the Chicago School, Aaron Director and Edward Levi, believed that price discrimination "might be considered more an enjoyment of the original power than an extension of it."⁶³ To the extent that metered tying was simply a variant of price discrimination, the Chicago School theorists advocated antitrust deference toward tying arrangements.

The two arguments noted in Parts I.A. and I.B. reinforce each other to form a school of thought that advocates the legality of patent tying. First, to the extent that the patent system is designed to create incentives to innovate, patent tying should be legal because it rewards, funds, and facilitates research. Second, if tying is within the scope of patent rights, then antitrust law should defer to patent law. Part II challenges these arguments and their conclusion by critiquing the premises and analyzing the implications of the price discrimination defense to patent tying.

⁶¹ See Ward Bowman, *Tying Arrangements and the Leverage Problem*, 67 YALE L.J. 19, 19 (1957) ("A distinction can usefully be made between leverage as a revenue-maximizing device and leverage as a monopoly-creating device. The first involves the use of existing power. The second requires the addition of new power.").

Louis Kaplow has explained this distinction as an illustration of the tension between static and dynamic analysis in antitrust:

Profit-maximizing practices are meant to refer roughly to those actions that can have fairly direct and immediate effects, while monopoly extension refers to behavior designed to have implications on the magnitude of profits and welfare loss in the future. The prototypical example of a profit maximization device is a pricing decision by a firm with market power, a decision which can be implemented rather quickly. By contrast, practices designed to affect the market share and elasticity of market demand might be labelled monopoly extension devices. These practices do not increase short-run profits, and might even decrease them. The firm's motivation is to change the structural conditions it faces in the future in order that it may receive greater profits in the future. This perspective is not static, in the sense that it does not take the existing parameters as given; rather it is dynamic, in that it focuses upon how the parameters change over time.

Louis Kaplow, *Extension of Monopoly Power Through Leverage*, 85 COLUM. L. REV. 515, 524 (1985). Bowman's analysis focused more on the static efficiency associated with price discrimination.

⁶² BOWMAN, *supra* note 43, at 54.

⁶³ Aaron Director & Edward H. Levi, *Law and the Future: Trade Regulation*, 51 NW. U. L. REV. 281, 290 (1956).

II. CHALLENGING THE INNOVATION DEFENSE TO PATENT TYING

While conventional wisdom suggests that patent tying facilitates innovation, the case for metered tying may be overstated because it fails to consider the potential negative effects of patent tying. In particular, metered tying allows patentees to obtain supracompetitive profits not just for the patented products themselves but also for complementary products that are outside the scope of the patent. Increasing monopoly profits can lead to rent-seeking behavior, such as inefficiently duplicative expenditures in research and development that decrease social welfare.

A. REEXAMINING THE RELATIONSHIP BETWEEN PATENT TYING AND INNOVATION

According to the theory discussed in Part I, the relationship between patentee profits and innovation incentives is deceptively simple. The questions remain whether the additional profits associated with price discrimination are necessary to spur research and whether tying is an appropriate mechanism to achieve this price discrimination.

1. *The Patentee's Reward*

Advocates of patent tying argue that the practice is justified because it rewards innovators. But even without engaging in tying, patentees already receive a substantial reward: the ability to charge higher prices for the patented product. A patent confers the right to exclude competitors from making infringing products which, in the absence of non-infringing substitutes, permits the patentee to charge a supracompetitive price. It is per se legal for any monopolist to unilaterally increase the price of its product.⁶⁴ This is particularly true for monopolies acquired through patents because the prospect of monopoly pricing provides the incentive to invent and patent in the first place.⁶⁵

With its exclusionary rights in hand, the patentee is able to charge whatever the market will bear. Of course, most patents do not confer monopoly power either because of the availability of non-infringing substitutes or low consumer demand for the patented product. This, however, is arguably a virtue of the patent system because patentees are rewarded in measure with the value that they have created. As Alan Sykes has explained:

⁶⁴ *Pac. Bell Tel. Co. v. linkLine Commc'ns., Inc.*, 129 S. Ct. 1109, 1118 (2009) (“Simply possessing monopoly power and charging monopoly prices does not violate § 2 . . .”).

⁶⁵ *See SCM Corp. v. Xerox Corp.*, 645 F.2d 1195, 1204 (2d Cir. 1981) (“No court has ever held that the antitrust laws require a patent holder to forfeit the exclusionary power inherent in his patent the instant his patent monopoly affords him monopoly power over a relevant product market.”).

The magnitude of the rents to inventors under a patent system is reasonably correlated with the value of an invention—monopoly rents will be greater the lesser the extent to which close substitutes for the patented good exist, and the greater the degree to which consumers value it in excess of its cost.⁶⁶

Patentees may argue that they should be able to capture the full value of their invention by using metered tying to extract the entire consumer surplus associated with their invention. But, while price discrimination achieved directly by charging different prices for the patented product to different consumers may be permissible, metered tying allows the patentee to secure its rewards from an unpatented product.

A patent allows the patentee to exclude competitors in order to increase the price of the *patented* product. Depending on the nature of the non-infringing substitutes, the patentee may legally charge a monopoly price for the patented product, but that does not entail any corresponding right to charge supracompetitive prices for other products. In patent cases, the Supreme Court early on expressed its concern that a patentee could use a tie-in to “derive its profit, not from the invention on which the law gives it a monopoly, but from the unpatented supplies with which it is used is wholly without the scope of the patent monopoly.”⁶⁷ The Court has specifically rejected the argument that the supracompetitive price in the tied product market is justified by the reduced price in the patented tying product market. In the *Motion Picture Patents* case, the Court explained:

It is argued as a merit of this system of sale under a license notice that the public is benefitted by the sale of the machine at what is practically its cost, and by the fact that the owner of the patent makes its entire profit from the sale of the supplies with which it is operated. This fact, if it be a fact, instead of commending, is the clearest possible condemnation of the practice adopted, for it proves that under color of its patent, the owner intends to and does derive its profit, not from the invention on which the law gives it a monopoly, but from the unpatented supplies with which it is used, and which are wholly without the scope of the patent monopoly, thus in effect extending the power to the owner of the patent to fix the price to the public of the unpatented supplies as effectively as he may fix the price on the patented machine.⁶⁸

Having invented a desirable product, the patent holder is entitled to raise the price of this product while preventing its rivals from selling an infringing product. In sum, the patentee’s reward is the ability to raise prices for the

⁶⁶ Sykes, *supra* note 14, at 57.

⁶⁷ *Carbice Corp. of Am. v. Am. Patents Dev. Corp.*, 283 U.S. 27, 31–32 (1931) (quoting *Motion Picture Patents Co. v. Universal Film Mfg. Co.*, 243 U.S. 502, 517 (1917)).

⁶⁸ *Motion Picture Patents Co.*, 243 U.S. at 516–17; *see also* *United States v. Gen. Elec. Co.*, 272 U.S. 476, 493 (1926) (“The price at which a patented article sells is certainly a circumstance having a more direct relation and is more germane to the rights of the patentee than the unpatented material with which the patented article may be used.”).

patented product, not the power to extract higher prices from locked-in sales of other products.

2. *Calibrating the Optimal Reward*

Given that patents confer exclusionary rights that permit patentees to charge a supracompetitive price while blocking infringing sales, it is fair to ask why patentees should be afforded the supplemental right to impose tying requirements on licensees and buyers. Proponents of metered tying would respond that tying increases the profits of patentees and thus creates additional incentives to innovate. This raises a series of questions about the need for the additional inducement to innovate. For example, where is the evidence that the ability to exclude rivals and charge a supracompetitive price for the patented product is insufficient incentive to engage in the socially optimal level of research and development?

It is important to remember that we are talking about a particular subset of patentees—patentees with valuable patents that confer sufficient market power to impose tying requirements on their customers. Indeed, we are talking about a subset within this subset because not all holders of valuable patents impose tying requirements. In fact, most do not. For example, valuable patents that are not used with a complementary consumable product do not lend themselves to price discrimination through metered tying.

Consequently, the patent reward system does not depend on metered tying; indeed, metered tying constituted patent misuse for most of the 20th century, and yet the patent reward system seemed to function well to spur innovation. Where is the evidence that those patented products used to facilitate tying arrangements are the patents that need a greater return in order to recoup the initial investment in research and development?

One problem inherent in any patent system is the difficulty in calibrating the optimal reward. Proponents of relaxing antitrust scrutiny of patent tying must believe that the current reward absent tying is suboptimal. To prove this, one would need to show that firms that engage in metered tying innovate more than comparable firms that do not. Such evidence does not exist.

Ward Bowman published his price discrimination defense of tying over a half-century ago. Plenty of time has passed for the supporters of metered tying to develop and present evidence to prove Bowman's theory that metered tying creates incentives to innovate. Yet, as one commentator has noted, "Nothing suggests that all or most inventors rely on the ability to exact returns from a tied market when deciding to innovate. In its purest form, nothing in the incentive theory justification for patent law contemplates allowing inventors to

exploit the grants from a patent in a wholly separate, tied market.”⁶⁹ Given the great influence of Bowman’s work in this area, the absence of empirical evidence to prove the theory is striking.

A more permissive attitude toward patent tying “reflects good policy if the tie can be justified as an ex ante incentive to innovation which would not otherwise occur.”⁷⁰ In the absence of such proof, permitting patent tying “would reflect an ill-advised extension of property rights and restraint of competition that injure the public interest in promoting innovation.”⁷¹ In short, proponents of a price discrimination defense to patent tying must show that those patent holders that seek to impose a tying requirement would not achieve sufficient profits from merely charging the supracompetitive price for the patented product to make future investments in innovation worthwhile.

3. *The Risk of Overinvestment*

The innovation justification for metered tying is founded on the premise that the consumer surplus retained by consumers who pay the monopoly price represents a pool of money that—if shifted to patentees through price discrimination—could spur more innovation. Klein and Wiley argue:

The inability of investors to appropriate the full value of such innovations (because of incomplete property rights, free riding, and the inability of prices to capture the full surplus) then is likely to make the private value of the research investment smaller than the social value. This situation implies a general underinvestment in innovations.⁷²

Metered tying, however, may allow patentees to capture the full surplus. Under a system of perfect price discrimination, “because the monopolist will capture the full social benefit of the invention, the monopolist has the proper incentive to invest the appropriate amount in an innovation.”⁷³ This would suggest that the law should affirmatively facilitate price discrimination by patentees.

⁶⁹ Tyler J. Gee, *Illinois Tool Works v. Independent Ink: Inking Out Limits of the Patent Grant*, 41 U.S.F. L. REV. 261, 293–94 (2006). Gee qualifies his statement by suggesting that “it seems consistent with patent policy to allow the practice if tying is the only way to incentivize innovation in the tying product market.” *Id.* at 294. His caveat seems appropriate, but—as this section argues—there is no evidence that “the only way to incentivize innovation” is by allowing patentees to engage in metered tying.

⁷⁰ HEDVIG SCHMIDT, *COMPETITION LAW, INNOVATION AND ANTITRUST* 170 (2009) (emphasis added) (quoting Rudolph J.R. Peritz, *Competition Policy and Its Implications for Intellectual Property Rights in the United States*, in *THE INTERFACE BETWEEN INTELLECTUAL PROPERTY RIGHTS AND COMPETITION POLICY* 142 (Steve Anderman ed., 2007)) (discussing 35 U.S.C. § 271(d)(5)).

⁷¹ *Id.*

⁷² Klein & Wiley, *supra* note 19, at 618.

⁷³ Abramowicz, *supra* note 7, at 159 n.158.

The greater-investment case for metered tying assumes that, absent price discrimination, there would be insufficient incentives for innovation. This argument raises several related considerations. First, as discussed above, there is scant evidence that current incentives for innovation are deficient. Absent such evidence, there is little reason to encourage patent tying in the name of increasing the patent reward.

Second, economic theory tells us that increasing the gains from monopoly may increase inefficient rent-seeking behavior. Increasing the value of a monopoly causes firms to expend more resources to acquire that monopoly. For example, if a particular monopoly is expected to generate \$100,000 in monopoly profits, a rational firm may spend \$90,000 to attain monopoly power in that market. In contrast, if a particular monopoly is expected to generate \$1 million in monopoly profits, a firm may spend \$900,000 to attain monopoly power in that market. If this were the entire story, then the expenditure would be both rational and efficient. The inefficiency comes if multiple firms make the same rational calculation. Thus, given a monopoly position that is expected to generate \$1 million in profits, two firms might each individually make the same calculation to spend \$900,000 in pursuit of that monopoly. Whichever firm secures the monopoly, society is worse off because \$1.8 million has been spent to create \$1 million worth of social value. This is inefficient.⁷⁴

Third, in the context of patents, this unproductive rent-seeking behavior takes the form of inefficiently excessive research activity. Professor Arti Rai notes that “the greater the reward associated with patent rights, the greater the possibility of patent races that produce excessive or duplicative investment.”⁷⁵ Patent scholars have recognized that “the lure of market power may cause investment in inventive activity to exceed social surplus.”⁷⁶ As price discrimination increases the patentees’ reward, firms will spend more resources to acquire that market power.⁷⁷ Alan Sykes notes that as price discrimination increases patentee profits, “monopolists may invest resources in obtaining monopoly, thereby dissipating monopoly profits *ex ante* and causing further deadweight losses. With patents in particular, monopoly rents may be dissipated by excessive investment in the race to develop a new invention—a so-

⁷⁴ See Richard A. Posner, *The Social Costs of Monopoly and Regulation*, 83 J. POL. ECON. 807 (1975).

⁷⁵ 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, 199 (2001); see also SCOTCHMER, *supra* note 10, at 98 (“[S]trong intellectual property rights can lead to an inefficient duplication of R&D costs, as firms vie for possession of those rights.”).

⁷⁶ Kieff, *supra* note 9, at 705.

⁷⁷ See Sykes, *supra* note 14, at 63 n.43 (“A possible offsetting factor is that price discrimination makes monopoly more profitable, and thus more resources may be expended by companies in pursuit of a monopoly position.”).

called patent race.”⁷⁸ Einer Elhauge argues that “the patent race literature proves that firms will make socially excessive (and often duplicative) investments if they capture all [of] the total surplus created by their innovations.”⁷⁹ Inefficient patent races have a net negative effect on social welfare.⁸⁰

In short, allowing the patentee to price discriminate through tying could potentially cause inefficient overinvestment. This is bad from both a patent and an antitrust perspective.⁸¹ In a non-patent context, the Supreme Court has condemned metered tying precisely because it increases the gains from monopoly. In *Jefferson Parish*,⁸² the Supreme Court lamented that tying arrangements “can increase the social costs of market power by facilitating price discrimination, thereby increasing monopoly profits over what they would be absent the tie.”⁸³

Supporters of price discrimination reject the overinvestment hypothesis. For example, Klein and Wiley recognize the argument⁸⁴ but rebut its premise. They argue that the traditional story of inefficient monopoly rent-seeking involves conduct like lobbying, which generates no independent value for society. In contrast, they envision competition “for assets (such as intellectual property) that permit a firm to produce differentiated (but not necessarily monopoly) goods that give it the ability to price above marginal cost and to price discriminate.”⁸⁵ In their view, “[c]ompetition for these assets proceeds via investments that are socially productive, not socially useless.”⁸⁶

Furthermore, Klein and Wiley assert that because firms are likely to invest their profits from price discrimination in efforts to “create a greater variety of products, to improve their brand names, to multiply their retail outlets, or to

⁷⁸ *Id.* at 57 (citing JEAN TIROLE, *THE THEORY OF INDUSTRIAL ORGANIZATION* 394–99 (1988)).

⁷⁹ Einer Elhauge, *Tying, Bundled Discounts, and the Death of the Single Monopoly Profit Theory*, 123 HARV. L. REV. 397, 440 (2009).

⁸⁰ Jonathan B. Baker, *Competitive Price Discrimination: The Exercise of Market Power Without Anticompetitive Effects (Comment on Klein and Wiley)*, 70 ANTITRUST L.J. 643, 647 n.13 (2003) (“Policies increasing incentives to innovate are generally a good thing because the social return to innovation is widely believed to exceed the private return substantially. In unusual circumstances, however, welfare could be reduced when innovation incentives are enhanced. This might occur, for example, if innovation incentives were already excessive, as in a wasteful patent race.”).

⁸¹ Kaplow, *supra* note 43, at 1875 (“Beyond its effects on the ratio, price discrimination also raises the problem of disproportionately high rewards to patentees, which . . . can make for bad patent policy independent of how such discrimination fares under antitrust analysis.”).

⁸² *Jefferson Parish Hosp. Dist. No. 2 v. Hyde*, 466 U.S. 2 (1984).

⁸³ *Id.* at 14–15.

⁸⁴ Klein & Wiley, *supra* note 19, at 616 (“The logic is that firms vying for a valuable monopoly status will waste even more resources in their quest for a prize magnified by a new right to price discriminate.”).

⁸⁵ *Id.*

⁸⁶ *Id.*

undertake R&D for product improvement . . . competition for the ability to price discriminate is not necessarily wasteful at all but is very likely to be socially efficient.”⁸⁷ They assume that the profits associated with price discrimination will be invested in socially efficient ways. But they offer no empirical evidence. More importantly, although Klein and Wiley assume that the expenditures are individually socially efficient, they neglect to address the risk of duplicative activity that is collectively inefficient. This oversight is critical because this risk is the primary thrust of the overinvestment hypothesis. As Michael Abramowicz explains:

On one hand, the ability of a patent holder to appropriate only monopoly profits and not the full social benefit will decrease the amount of research activity. On the other hand, each competitor’s concern with the private rather than social marginal benefits and costs of its research endeavours will tend to lead to excessive research activity. Even if the two effects happen to offset one another, producing just the right amount of investment in social innovation, there remains a second problem with patent races—that research efforts may be duplicative. When many different inventors work independently toward the same goal, society’s resources may be inefficiently channeled.⁸⁸

Ultimately, this is an empirical question, and the answer undoubtedly varies by industry.⁸⁹ High-level generalizations cannot answer the question in the abstract. Consequently, my point is not to argue that metered tying will necessarily lead to inefficient patent races or other monopoly rent-seeking behavior. Rather, it is to argue that the net effect on innovation is indeterminate. This uncertainty undermines the innovation arguments in favor of patent tying.

B. QUESTIONING PATENT TYING AS A FUNDING MECHANISM FOR INNOVATION

One common defense of strong patent rights is that patent profits fund future innovation.⁹⁰ Some respected commentators have suggested that patentees

⁸⁷ *Id.* at 616–17.

⁸⁸ Abramowicz, *supra* note 7, at 185.

⁸⁹ See generally BURK & LEMLEY, *supra* note 5.

⁹⁰ Erin Donovan, *Beans, Beans, The Patented Fruit: The Growing International Conflict over the Ownership of Life*, 25 LOY. L.A. INT’L & COMP. L. REV. 117, 130 (2002) (“For instance, without patent protection, biotech companies will not have profit margins sufficient to fund new research.”); Richard S. Gruner, *Corporate Patents: Optimizing Organizational Responses to Innovation Opportunities and Invention Discoveries*, 10 MARQ. INTELL. PROP. L. REV. 1, 42 (2006) (“Value returned in connection with an initial patented advance can help to fund further innovative efforts.”); Diane Christine Renbarger, *Putting the Brakes on Drugs: The Impact of KSR v. Teleflex on Pharmaceutical Patenting Strategies*, 42 GA. L. REV. 905, 908 (2008) (“The pharmaceutical industry has stated that it depends largely on revenue from patented drugs to fund the expensive research and development involved in creating new drugs.”); Diana A. Villamil, *Redefining Utility in Determining the Patentability of DNA Sequences*, 5 J. MARSHALL REV. INTELL. PROP. L. 238, 267 (2006) (“Patent law offers researchers the ability to recover costly research

should be able to impose tying arrangements because they are innovators and the additional profits from metered tying will reward prior investments and fund future investments in research and development.⁹¹ Such reasoning is problematic for several reasons. First, this argument assumes reinvestment in innovation, but no empirical evidence proves that patentees who use metered tying invest more in subsequent research than patentees who simply charge the monopoly price for the patented product. It is important to remember that price discrimination does not directly cause innovation. It is a pricing strategy. We know that everything that improves the patentee's bottom line does not create a net increase in innovation. That is why patent law limits the scope and duration of patents.

Second, even if the patentee could prove that it invested its excess profits in innovative or other productive activity, that does not provide the basis for an antitrust defense. In general, antitrust law does not permit defendants to escape liability by arguing that their monopoly profits go to charity or to subsidize a beneficial business venture. Similarly, the fact that the tying seller is an innovative patent holder does not provide a defense for an otherwise illegal tying arrangement. Most corporations are innovative—even if they do not have innovations that are patented, or patentable, or used as tying products in tie-ins. A firm may innovate to secure the patent and then try to expand the reach or scope of its patent to increase profits with no pro-innovative effect.

Third, perhaps the most important criticism of the argument that patentees should be able to engage in metered tying because the excess profits fund future innovation is that such a defense has no limiting principle. Why shouldn't patentees be able to violate any law so long as the violation is profitable and some of the illegal proceeds will be invested in research and development? Patent owners could engage in a variety of anticompetitive behaviors that would increase their returns. For example, they could form price-fixing

expenses, make profits with which to fund further research, and attract investors to expand on this research."); Clark A.D. Wilson, *The TRIPS Agreement: Is It Beneficial to the Developing World, or Simply a Tool Used to Protect Pharmaceutical Profits for Developed World Manufacturers?*, 10 J. TECH. L. & POL'Y 243, 262 (2005) ("Because of the small number of highly successful products, the twenty year market exclusivity provided by patent protection is necessary to generate enough profit to fund further research and development."); Grant C. Yang, *The Continuing Debate of Software Patents and the Open Source Movement*, 13 TEX. INTELL. PROP. L.J. 171, 196 (2005) ("large companies are efficiently structured to capitalize on an invention and to use patents to fund research to promote innovation"); see also *Mentor Graphics Corp. v. Quickturn Design Systems, Inc.*, 999 F. Supp. 1388, 1394 (D. Or. 1997) (patentee can show irreparable harm if competitor takes sales because this will "limit[] its ability to fund vital research and development"); *Zenith Labs., Inc. v. Eli Lilly and Co.*, 460 F. Supp. 812, 826 (D. N.J. 1978) (ordering injunction against patentee's competitor because "the loss of profits resulting from the increased competition would result in a reduction of funds available for testing and research and development").

⁹¹ See, e.g., Wright, *supra* note 36, at 355 ("Price discrimination does not generally reduce consumer welfare when one appropriately accounts for all static and dynamic welfare effects.").

cartels with other patent owners. Suppose that two firms possess substitute patents on printheads and that no non-infringing printheads exist. In a competitive market, neither firm can charge the monopoly price because the other firm would undercut it. If the firms colluded, however, each could raise price, reduce output, and maximize their profits. Should they be able to conspire simply because they are patentees and their agreement increases the rewards flowing from their patents and the resources to invest in future research? Probably not.⁹² The Supreme Court has suggested that simply because conduct increases the profits to the patentee does not make that conduct legal under antitrust laws;⁹³ rather, a limiting principle is necessary.

In sum, mere possession of a patent does not grant patentees free rein to increase their profits in the name of creating incentives to innovate. If patents conferred such broad immunity from legal sanctions, then patentees could form price-fixing cartels and pay non-infringing competitors to exit the market. But patents provide no defense to either of these acts; both are per se illegal.

C. TYING AND PATENT SCOPE

Supporters of metered tying argue that because patentees are allowed to price discriminate, they should be able to use tying arrangements as a mechanism to do so.⁹⁴ A patent, however, does not confer any right to distort competition or interfere with consumer decisions in markets outside the scope of the patent. This is true as a matter of both patent law and antitrust law.

With respect to patent law, the Supreme Court addressed tying arrangements in *Motion Picture Patents Co. v. Universal Film Manufacturing Co.*⁹⁵ In that case, the patentee licensed its patented film projectors subject to the licensee agreeing to use it only to show the patentee's films. In evaluating the legality of this tying condition, the Court looked to "the Patent Act, whose relevant provision gave the patentee 'the exclusive right to make, use, and vend the invention or discovery,' but said nothing about an exclusive right in unpatented complementary products."⁹⁶ The Court held that patent laws did

⁹² HOVENKAMP, *supra* note 32, at 286.

⁹³ *United States v. Line Materials Co.*, 333 U.S. 287, 300 (1948) (noting that "[t]he original context of the words" in its 1926 *General Electric* opinion "makes clear that they carry no implication of approval of all a patentee's contracts which tend to increase earnings on patents").

⁹⁴ *See supra* Part I.

⁹⁵ 243 U.S. 502 (1917).

⁹⁶ HOVENKAMP, JANIS, LEMLEY & LESLIE, *supra* note 8, § 4.2, at 4–17; *Motion Picture Patents Co.*, 243 U.S. at 510 ("It has long been settled that the patentee receives nothing from the law which he did not have before, and that the only effect of his patent is to restrain others from manufacturing, using, or selling that which he has invented. The patent law simply protects him in the monopoly of that which he has invented and has described in the claims of his patent.").

not confer upon patentees the right to “prescribe by notice attached to a patented machine the conditions of its use and the supplies which must be used in the operation of it, under pain of infringement of the patent.”⁹⁷ The Court reasoned:

Such a restriction is invalid because such a film is obviously not any part of the invention of the patent in suit; because it is an attempt, without statutory warrant, to continue the patent monopoly in this particular character of film after it has expired, and because to enforce it would be to create a monopoly in the manufacture and use of moving picture films, wholly outside of the patent in suit and of the patent law as we have interpreted it.⁹⁸

Motion Picture Patents essentially established that tying can constitute patent misuse. Congress has since narrowed the reach of the opinion by amending the federal patent statute to provide that tying can be misuse only if the patentee has market power in the tying product market.⁹⁹ By limiting the scope of the patent misuse doctrine, however, Congress did not create an affirmative right for patentees to impose tying requirements on buyers or licensees in order to effect price discrimination.

As a matter of statutory antitrust law, having a patent is not a defense to a tying claim. Section 3 of the Clayton Act explicitly prohibits patentees from employing tying arrangements when the effect is to substantially lessen competition because the statute applies to tying products “whether patented or unpatented.”¹⁰⁰ The patent language in Section 3 is not an afterthought; indeed, the Senate version of the bill reached *only* those tie-ins involving a patented tying product.¹⁰¹ The Congressional focus on patent tying represented the legislators’ repudiation of the Supreme Court’s earlier decision in *A.B. Dick* to allow patentees to impose tying requirements.

⁹⁷ *Motion Picture Patents Co.*, 243 U.S. at 509.

⁹⁸ *Id.* at 518.

⁹⁹ 35 U.S.C. § 271(d)(5).

¹⁰⁰ 15 U.S.C. § 14.

¹⁰¹ One commentator explained:

The statutory language ultimately enacted into law as Section 3 of the Clayton Act differed from both the language of the House of Representatives’ bill and the provision originally adopted by the Senate. The distinction between the House bill and the Senate substitute as offered by Senator Walsh was that the House bill was intended to cover all types of articles (patented or unpatented) used as the tying product, whereas the Senate substitute was intended to apply only to patented articles. In conference, however, the Senate conferees amended the Senate-approved bill to its present form. In essence, the conferees adopted the provisions of the original House bill, eliminated the penal provision, and further adopted the Senate Judiciary Committee’s addition of the words ‘whether patented or unpatented.’

Byron A. Bilicki, *Standard Antitrust Analysis and the Doctrine of Patent Misuse: A Unification Under the Rule of Reason*, 46 U. PITT. L. REV. 209, 216–17 (1984).

Defenders of tying arrangements seem to suggest that patent holders have an affirmative right to engage in price discrimination and thus should be able to employ tying arrangements to implement this pricing strategy.¹⁰² The premise of this line of argument is questionable for several reasons. First, patents confer no affirmative rights. Patent owners have no statutory right to manufacture their inventions. For example, in the presence of blocking patents a patentee may be unable to practice its invention because it infringes another's patent. Instead, patents confer the right to *exclude* others from making or selling the protected invention. More specifically, patents give inventors a right to sue infringers for injunctive relief and damages. This is why Judge S. Jay Plager of the Federal Circuit has lamented that the patent grant is actually “‘little more than a right to litigate.’”¹⁰³

Second, even if patentees enjoyed an affirmative right to price discriminate, that does not translate into a right to use metered tying to effectuate such price discrimination.¹⁰⁴ Patents confer the right to exclude infringers, not the right to engage without interference in any particular pricing structure.¹⁰⁵ To the extent that a particular tying arrangement may constitute patent misuse or violate antitrust laws, patent law provides no defense for metered tying.

Finally, because patent rights are exercised through infringement litigation, the relationship between infringement and tying can be instructive. To determine whether patentees have a right to engage in metered tying, it might be useful to consider when a competitor's effort to thwart the tie-in constitutes infringement. In general, a patentee cannot sue rivals for selling complementary products used in conjunction with the patented product. But patent law makes a distinction between staple products—those that have uses unrelated to the patent product—and non-staple products that are specially designed for use with the patented product. A rival's sale of a non-staple product can constitute contributory infringement.¹⁰⁶ That gives latitude to patentees to impose ties. When the tied product is a non-staple, the patentee has the ability to impose a tie-in because, as Michael Meurer notes, “[t]ies that serve to deter contributory infringement fall into a safe harbor created in § 271(d) which

¹⁰² See *supra* Part I.

¹⁰³ Jeanne C. Fromer, *Claiming Intellectual Property*, 76 U. CHI. L. REV. 719, 774 (2009) (quoting Interview with Circuit Judge S. Jay Plager, 5 J. PROPRIETARY RTS. 2, 6 (Dec. 1993)).

¹⁰⁴ See *United States v. Loew's*, 371 U.S. 38, 46–47 (1962) (“The patentee is protected as to his invention, but may not use his patent rights to exact tribute for other articles.”); see also *Jefferson Parish Hosp. Dist. No. 2 v. Hyde*, 466 U.S. 2, 16 (1984) (“[T]he sale or lease of a patented item on condition that the buyer make all his purchases of a separate tied product from the patentee is unlawful.”).

¹⁰⁵ See, e.g., *Brulotte v. Thys Co.*, 379 U.S. 29 (1964); *Automatic Radio Mfg. Co. v. Hazeltine Research, Inc.*, 339 U.S. 827 (1950).

¹⁰⁶ See, e.g., *Dawson Chem. Co. v. Rohm & Haas Co.*, 448 U.S. 176 (1980).

assures that such a tie is not misuse."¹⁰⁷ When the tied product is a staple, however, the patentee cannot use patent law to prevent buyers and licensees from using other manufacturers' versions of the tied product. This suggests that much metered tying falls outside of the scope of the patent.

In sum, given that patent law does not confer any right to price discriminate, tying arrangements cannot be justified as a means of effectuating this so-called right.

III. THE EFFECTS OF METERED TYING ON INNOVATION IN THE TIED PRODUCT MARKET

While supporters of patent tying focus on innovation in the tying product market, the more significant innovation effects are likely to be found in the tied product market because this is the market that tying arrangements may distort. This Part argues that patentees have an incentive to suppress innovation in the tied product market. And, whether by design or happenstance, tying arrangements can have the effect of reducing this innovation.¹⁰⁸

A. THE PATENTEE'S ANTI-INNOVATION IMPULSE

The patentee may have a strong incentive to stifle innovation in the tied product market. This is an independent reason to be concerned about conduct that distorts competition in that market. It may seem that the tying seller would want to encourage innovation in the tied product market because improving a complementary product should increase demand for the patentee's product. If, however, the innovator in the tied product market becomes sufficiently successful, it could undermine the patentee's dominant position and profitability in the tying product market.

First, the tied product can evolve in a manner that reduces demand for the tying product (and in extreme cases renders the tying product unnecessary). Innovators in the tied product market are potential long-term rivals in the ty-

¹⁰⁷ Meurer, *supra* note 16, at 1895; *see also* Mobil Oil Corp. v. Amoco Chems. Corp., 779 F. Supp. 1429 (D. Del. 1991), *aff'd*, 980 F.2d 742 (Fed. Cir. 1992) (suggesting that when the patentee holds patents on both the tying and tied products, and neither "could be considered a staple item of commerce," tying does not constitute patent misuse).

¹⁰⁸ Some of the sources in this section that discuss how tying arrangements can reduce innovation in the tied product do not focus specifically on metered tying. Rather, these scholars analyze scenarios in which the tying seller is attempting to foreclose competition in the tied product market. In other words, they examine tying as a foreclosure device, not a metering device. Nevertheless, the tying arrangements discussed by these scholars, and their potentially negative effects, are relevant to the discussion of the effect of tying on innovation. If, by employing a tying arrangement, a tying seller locks up a sufficient amount of the tied product market to meaningfully reduce the rewards for improving the tied product, then the tying can have anti-innovation effects even if the tying seller's primary goal was foreclosure (rather than metering).

ing product market.¹⁰⁹ In some markets, the threat to long-term entry into the tying product market represents a greater menace to competition than the short-term foreclosure in the tied product market. As the *IP and Antitrust* treatise explains that “[t]he real concern of foreclosure is not leverage but rather longer run stagnation and lack of competitive vitality. For example, today’s producer of a tied product may be tomorrow’s producer of a tying product. What better way to deter that firm’s entry than to deny it access to the tied product market?”¹¹⁰ This, in essence, was the government’s theory in the *Microsoft* case.¹¹¹ Microsoft was concerned that browsers (and Java) could evolve in a manner that made software application writers and consumers less dependent on Microsoft’s operating system. Microsoft, according to the government, sought to stifle innovation in the markets for the tied product of browsers. In short, a tying seller may want to stop innovation in the tied product market before it threatens the tying seller in the tying product market.

Second, if an innovator were to achieve dominance in the tied product market, it could diminish the tying seller’s ability to charge a monopoly price for the tying product alone. When each of two firms has a monopoly, and their products are complementary, both cannot charge the profit-maximizing monopoly price that each would charge in the absence of a monopolist in a complementary product market. As a result, the patentee may not be able to charge the same supracompetitive price for the tying product. In an extreme reversal of positions, the seller of the tied product could theoretically attempt to enter the tying product market by means of its own tying arrangement—“I won’t sell you the ‘formerly tied product’ unless you buy the ‘formerly tying product’ from me.”

Under either of these scenarios, the original tying seller is in a worse position than if it had stifled innovation in the tied product market. To the extent that suppliers of the tied product represent long-term threats to a patentee’s dominant position in the tying product market, tying arrangements that reduce rivals’ expected returns in the tied product market reinforce market dominance in the tying product market.¹¹²

¹⁰⁹ See Robin Cooper Feldman, *Defensive Leveraging in Antitrust*, 87 GEO. L.J. 2079, 2091 (1999).

¹¹⁰ HOVENKAMP, JANIS, LEMLEY & LESLIE, *supra* note 8, § 21.3, at 21–24.

¹¹¹ *United States v. Microsoft Corp.*, 253 F.3d 34 (D.C. Cir. 2001).

¹¹² Carlton & Waldman, *supra* note 34, at 197 (“The conclusion is that tying primary and complementary goods can enable the initial monopolist to monopolize the newly emerging market by lowering the other producer’s return to entering that market.”).

B. THE ANTI-INNOVATION EFFECTS OF TYING

Tying arrangements can reduce competitors' incentives and abilities to innovate in the tied product market for several related reasons. This Part considers four ways in which patent tying could distort innovation.

1. *The Relationship Between Competition and Innovation*

Tying arrangements can reduce competition in the tied product market. Tying law is based on the theory that tie-ins can permit a monopolist to leverage its market power from one market into another.¹¹³ The Chicago School responded that such leveraging is not possible.¹¹⁴ While the Chicago School's philosophy on tying gained much traction in the 1980s,¹¹⁵ economists have since explained how tie-ins can foreclose enough of the tied product market to deter entry because new competitors may not be able to make enough sales to cover their fixed costs or to achieve the minimum efficient scale to compete profitably.¹¹⁶ In dynamic markets, "tying can be used to transfer monopoly power from the primary market to a newly emerging market."¹¹⁷ Carlton and Waldman argue that "the use of tying to preserve a monopoly position will be most important in industries characterized by substantial innovation where product lifetimes are short."¹¹⁸ Even so-called efficient metered tying can exclude competitors in the tied product market.¹¹⁹ Some tied product markets are not susceptible to complete foreclosure because the tied product is a staple that has many uses unrelated to the tying product.¹²⁰ A tying seller, however, may still want to reduce the number of sellers in the tied product market because this may make it easier for the tying seller to monitor its customers to ensure that they are not circumventing the tie-in.¹²¹

¹¹³ Leslie, *Tying Arrangements*, *supra* note 29, at 729.

¹¹⁴ See, e.g., Bork, *supra* note 40, at 366–67; *id.* at 372 ("[T]here is no viable theory of a means by which tying arrangements injure competition."); cf. Posner, *supra* note 19, at 201 (describing exclusion as "unlikely").

¹¹⁵ See, e.g., *Jefferson Parish Hosp. Dist. No. 2 v. Hyde*, 466 U.S. 2 (1984) (O'Connor, J., concurring in the judgment) (arguing for greater deference to tying arrangements); Leslie, *Tying Arrangements*, *supra* note 29, at 740–41 (noting Chicago School's influence on tying decisions, including Justice O'Connor's *Jefferson Parish* concurrence).

¹¹⁶ Barry Nalebuff, *Bundling as an Entry Barrier*, 119 Q.J. ECON. 159 (2004); Michael D. Whinston, *Tying, Foreclosure, and Exclusion*, 80 AM. ECON. REV. 837 (1990); see also Elhauge, *supra* note 79, at 413–14.

¹¹⁷ Carlton & Waldman, *supra* note 34, at 194.

¹¹⁸ *Id.* at 196.

¹¹⁹ Nalebuff, *supra* note 116, at 183.

¹²⁰ HOVENKAMP, JANIS, LEMLEY & LESLIE, *supra* note 8, § 21.3, at 21–26 ("In sum, when assessing tying foreclosure claims one must assess not only the defendant's market position in the tying market, but also the effective percentage of foreclosure in the tied market, and the latter market can be far larger than the former, particularly where tied goods are staple commodities.").

¹²¹ See Leslie, *Metered Tying*, *supra* note 39 (discussing the risk of customers evading a tying requirement).

If patent tying can, in fact, reduce competition in the tied product market, then the innovation-related effects of tying might be viewed through the lens of the Schumpeter-Arrow debate. Schumpeter argued that monopolists are more innovative than firms in competitive markets.¹²² In contrast, Arrow argued that competition spurs greater innovation.¹²³ For many, the dispute remains contested.¹²⁴ The answer may depend on many other variables.¹²⁵ Yet much theoretical¹²⁶ and empirical¹²⁷ evidence supports Arrow's position.

In a similar vein, when the competitors in the tied product market are smaller firms—as is often the case—the exclusionary effects of metered tying may have implications for innovation. In many (but not all) industries, smaller firms are the major engines of innovation.¹²⁸ For example, innovation flourished in software and Internet-related markets when dozens of small firms

¹²² See also John E. Lopatka & William H. Page, *Internet Regulation and Consumer Welfare: Innovation, Speculation, and Cable Bundling*, 52 HASTINGS L.J. 891, 916 (2001) (“Without doubt, a monopolist may innovate in ways that build upon its embedded business.”).

¹²³ BURK & LEMLEY, *supra* note 5, at 72 (“Kenneth Arrow has argued that competition, not monopoly, best spurs innovation because, to simplify greatly, companies in a competitive marketplace will innovate in order to avoid losing out to a competitor, while monopolists can afford to be lazy and will fear that new inventions will steal their own markets.”) (citing Kenneth J. Arrow, *Economic Welfare and the Allocation of Resources for Invention*, in THE RATE AND DIRECTION OF INVENTIVE ACTIVITY 609, 619–20 (Nat'l Bureau of Econ. Research ed., 1962), reprinted in 5 KENNETH J. ARROW, COLLECTED PAPERS OF KENNETH J. ARROW: PRODUCTION AND CAPITAL 104, 115–16 (1985)).

¹²⁴ See, e.g., Lopatka & Page, *supra* note 122, at 915 (“But no confident prediction can be made that an unconcentrated market will necessarily produce more innovation than a relatively concentrated one.”).

¹²⁵ SCOTCHMER, *supra* note 10, at 173 (“Whether competition promotes innovation better than, for example, a market with concentrated market power depends, among other things, on the nature of the innovative process and the innovative environment.”).

¹²⁶ BESSEN & MEURER, *supra* note 3, at 168 (“[L]arge, incumbent firms might be slow to develop innovations that threaten to ‘cannibalize’ existing markets. Industry entrants and outsiders do not worry about displacing their existing product line and thus have stronger incentives to develop technologies that replace older technologies. The theoretical literature that has developed this point is inconclusive, though, because in some cases incumbent firms will innovate first to ‘preempt’ innovation by potential entrants. Either way, the existence of potential entrants spurs innovation.”); Howard A. Shelanski, *Unilateral Refusals to Deal in Intellectual and Other Property*, 76 ANTITRUST L.J. 369 (2009).

¹²⁷ BESSEN & MEURER, *supra* note 3, at 13 (“[S]everal studies suggest that a moderate degree of competition might actually spur innovation.”); Brett M. Frischmann & Mark A. Lemley, *Spillovers*, 107 COLUM. L. REV. 257, 277 n.71 (2007) (collecting authorities); K. Pavitt, M. Robson & J. Townsend, *The Size Distribution of Innovating Firms in the U.K.: 1945–1983*, 35 J. INDUS. ECON. 297 (1987); see also Robert P. Merges & Richard R. Nelson, *On the Complex Economics of Patent Scope*, 90 COLUM. L. REV. 839, 877 (1990) (noting “empirical evidence that the granting of broad patents in many cases has stifled technical advance and that where technical advance has been rapid there almost always has been considerable rivalry”).

¹²⁸ Frischmann & Lemley, *supra* note 127, at 276 (“smaller companies are often more innovative than larger companies with significantly greater R&D budgets”); cf. BURK & LEMLEY, *supra* note 5, at 41 (“evidence suggesting that the relationship between firm size and significance of innovation is not universal, but is itself industry-specific”).

competed.¹²⁹ Professors Burk and Lemley note that the nature of innovation differs based on firm size, with smaller firms “disproportionately likely to engage in breakthrough innovations” and larger firms making incremental improvements.¹³⁰ To the extent that Arrow is correct, having fewer independent manufacturers of the tied product reduces the likelihood of innovation.¹³¹

2. *The Competitor’s Incentive to Innovate in the Tied Product Market*

In the face of patent tying, the tying seller’s competitors in the tied product market have a reduced incentive to innovate because they cannot make sales of an improved tied product to consumers who are contractually bound to purchase exclusively from the tying seller.¹³² For example, A.B. Dick’s competitors had little incentive to develop higher quality stencils because even if they succeeded in making a better product, mimeograph users subject to A.B. Dick’s tying requirement could not purchase and use the improved stencil.¹³³ In sum, the competitor in the tied product market has less incentive to innovate because even if its product is superior, consumers will not be able to purchase and use it.¹³⁴

This concern that a tying seller could use a tie-in to stifle innovation in a tied product market has animated government cases against Microsoft both in the United States and Europe. The U.S. Department of Justice pursued its antitrust case against Microsoft in part because of the anti-innovation effects of tying. Microsoft possessed monopoly power in the market for Intel-compatible PC operating systems, but feared that Internet browsers could evolve in a manner that would undermine its monopoly if software developers could

¹²⁹ *See id.* at 73; *see also id.* (noting “empirical evidence suggesting that competition is a better spur to innovation than monopoly even in the telecommunications industry”).

¹³⁰ *See id.* at 41 (“The evidence is disputed, and patterns are not entirely clear, but it does seem that small firms are more efficient innovators and that they are disproportionately responsible for the most important innovations.”).

¹³¹ The Schumpeter-Arrow debate, however, does not map neatly onto the tied product market because such innovation takes place in the shadow of the patented tying product. The tying arrangement may distort innovation incentives in a manner that is not accounted for in the broader discussion over which market structure maximizes innovation. *See infra* notes 150–165 and accompanying text.

¹³² This assumes that enough consumers do not want to breach their contract or that sellers of the tied product are unwilling to invest if recoupment is based on a sufficient number of consumers breaching their agreements with the tying seller.

¹³³ *See* Christopher R. Leslie, *Antitrust and Patent Law as Component Parts of Innovation Policy*, 34 J. CORP. L. 1259 (2009) (making a similar argument with biopsy gun needles).

¹³⁴ *Town Sound & Custom Tops, Inc. v. Chrysler Motors Corp.*, 959 F.2d 468, 475–76 (3d Cir. 1992) (“[A]nother fear has been that the second monopoly could impede innovation in the tied product market by reducing competitive pressure in that market.”); *Grappone, Inc. v. Subaru of New England, Inc.*, 858 F.2d 792, 796 (1st Cir. 1988) (“[I]nsofar as tying impedes ‘competition on the merits,’ discouraging the search for innovation or efficiency, it does so in the tied product markets.” (internal citation omitted)).

write applications based on browsers instead of operating systems. Software developers would no longer have to write their applications to run only on Microsoft's Windows operating system; if applications ran on browsers, consumers could buy any operating system and still run these applications.

Microsoft sought to prevent browser technology from progressing in that direction by imposing a tie-in whereby purchasers of Microsoft's operating system would have to use its browser, Internet Explorer, as well. The tie-in was initially contractual in nature but Microsoft later made it a technological tie-in by commingling the code for its operating system and browser. Microsoft's goal was not to monopolize the browser market in order to extract monopoly profits from browser sales, but rather to prevent innovation in the browser market that would destabilize Microsoft's valuable monopoly over operating systems. Microsoft succeeded in suppressing innovation in the browser market.¹³⁵

The European Commission expressed similar concerns about Microsoft's conduct, albeit with a different tied product. There, "the Commission feared that the tying of Windows Media Player (WMP) and Windows would foreclose competition and stifle innovation in the related media software encoding and management markets because WMP would become the preferred choice for complementary content and application providers."¹³⁶ In both instances,

¹³⁵ Herbert Hovenkamp, *Restraints on Innovation*, 29 CARDOZO L. REV. 247, 252 (2007) ("Microsoft was engaged in suppressing the innovations of others.").

Microsoft also thwarted innovation by stopping the threat of Sun Microsystem's Java technology, which would allow software developers to write their applications in a language that any operating system could read. Microsoft eliminated the Java threat not through tying—as it did with browsers—but by developing a non-compatible version of Java and then deceiving software developers into believing that the Microsoft version of Java would allow customers to run their programs on any operating system when in reality they would only run on Windows. The en banc D.C. Circuit held this violated Section 2. *United States v. Microsoft Corp.*, 253 F.3d 34 (D.C. Cir. 2001).

Economists Choi and Stefanadis have argued that Microsoft's anticompetitive conduct directed at the prior-dominant browser, Netscape's Navigator, and at Java combined to increase the anti-innovation effects of its tying arrangement. They explain:

By tying its operating system to its Internet Explorer, Microsoft makes entry in one component dependent upon success in the other: Netscape can gain access to consumers and earn a significant profit mainly if Java succeeds, and vice versa. Tying may thus make the prospects of investment in Netscape Navigator or Java more uncertain, reducing these rivals' incentive for innovation.

Jay Pil Choi & Christodoulos Stefanadis, *Tying, Investment, and the Dynamic Leverage Theory*, 32 RAND J. ECON. 52, 53–54 (2001) [hereinafter *Tying*]; see also Jay Pil Choi & Christodoulos Stefanadis, *Bundling, Entry Deterrence, and Specialist Innovators*, 79 J. BUS. 2575, 2577 (2006) [hereinafter *Bundling*] ("As both operating systems and Internet browsers are characterized by continuous innovation, bundling may allow Microsoft to reinforce its dominant position by preventing specialist competitors, such as Sun and Netscape, from coordinating dynamically and introducing product improvements into the two markets.").

¹³⁶ SCHMIDT, *supra* note 70, at 30.

competition law authorities recognized how a tying arrangement can affect the likelihood of innovation in the tied product market.

Tying by a patentee may make it harder for a firm that specializes in the tied product market to recoup its fixed costs and initial investment in research.¹³⁷ This argument should not prove controversial because it mirrors the justification that price discrimination advocates make for metered tying—innovators must earn sufficient return on investment to make innovation efforts profitable. Economists Choi and Stefanadis argue that this concern animated the European Commission's decision to block the 2001 proposed merger between General Electric and Honeywell, leading manufacturers of aircraft engines and avionics equipment, respectively. They report that the "European Commission was concerned that the merged company would bundle its products, thereby discouraging more specialized competitors, such as Pratt & Whitney and Rolls Royce, in engines, or Rockwell Collins, in avionics, from introducing product improvements into their markets."¹³⁸ Whether the EC's prediction would have proved accurate, we cannot know, but the reasoning is logical. For example, if General Electric were to use its dominant position in aircraft engines to coerce airplane manufacturers to purchase avionics from the merged company, other avionics companies would not be competing on a level playing field. The market for avionics equipment is sufficiently small that the predicted foreclosure of part of that market can distort research decisions. It makes less sense to invest in avionics technology research if one cannot sell the resulting equipment in a completely competitive market.¹³⁹ The result would be to reduce innovation in the tied product market—avionics in this case.

It may seem like many of the items selected to be a metering product—ink or punchcards, for instance—are uniform or standardized in a way that does not lend itself to innovation, like Internet browsers and avionics do.¹⁴⁰ But even pedestrian products experience innovation. In theory, for example, Inde-

¹³⁷ Choi & Stefanadis, *Bundling*, *supra* note 135, at 2576 ("[B]undling may prevent the dynamic coordination of specialist entrants. When specialist innovators need to earn immediate profits to justify their entry into the market—either because of the existence of financial constraints or the presence of immediate fixed costs that cannot be recouped by future profits—they are forced to stay out of the market because of bundling."); Carlton & Waldman, *supra* note 34, at 196 ("[T]ying can stop the alternative producer from ever entering the complementary market by eliminating the profits associated with the alternative producer selling complementary units in the first period, thereby making it impossible to cover the fixed costs of entry.").

¹³⁸ Choi & Stefanadis, *Bundling*, *supra* note 135, at 2577 (citations omitted).

¹³⁹ See *Times-Picayune Pub. Co. v. United States*, 345 U.S. 594, 605 (1953) ("By conditioning his sale of one commodity on the purchase of another, a seller coerces the abdication of buyers' independent judgment as to the 'tied' product's merits and insulates it from the competitive stresses of the open market.").

¹⁴⁰ Similarly, markets for staples are generally considered less susceptible to monopolization. See, e.g., HOVENKAMP, JANIS, LEMLEY & LESLIE, *supra* note 8, § 21.3 at 21–25 ("Foreclosure is

pendent Ink could have developed a superior ink.¹⁴¹ Trident's internal documents showed that competitive pressure existed to make ink that dried faster.¹⁴² Further, some of Trident's customers preferred rivals' ink because it was "blacker."¹⁴³ Even if Independent Ink did not improve the quality of the ink itself, it could have conceivably developed a way to make the same ink more efficiently. There is little possibility of such innovation if the rival firm is driven from the specialty ink market.

Even if tied products are often staples in which innovation does not routinely occur, metered tying can affect the likelihood of innovation when the tied product is a form of service. For example, the metering in *Kodak* depended in large part on the tying seller eliminating ISOs, which would interfere with its price discrimination plan.¹⁴⁴ While this strategy would make it harder for Kodak's customers to cheat by purchasing market-priced service from ISOs, it also kept ISOs out of a market in which they could be potential innovators. An ISO is probably unlikely to craft a new competing copier. But innovation may come in the form of developing more efficient means of servicing copiers. When multiple firms are exposed to the machines, it potentially increases the likelihood of innovation.

Finally, contrary to his conclusion, Bowman's observation that without tying, patentees will not capture the entire value associated with their innovations may counsel against allowing patent tying. Bowman asserted that if patentees do not collect the full value of their inventions, they will underinvest in research and development.¹⁴⁵ Professors Frischmann and Lemley explain why this is not the case. First, they note that "at some point, there are

rarely a concern when the tied product is a staple, because attaining foreclosure in such cases is virtually impossible, even if the patentee is a monopolist in the upstream market.").

¹⁴¹ After all, Trident argued that other inks were inferior and more likely to lead to clotting and printhead malfunction. Grimes & Sullivan, *supra* note 37, at 345 ("Trident argued that the tied sale of its ink insured that customers would not purchase inferior inks that could cause the printhead to malfunction. But Trident's own test showed that Independent Ink's product was chemically indistinguishable from its own.") (citing Brief for Respondent at 5–6, *Illinois Tool Works, Inc. v. Independent Ink, Inc.*, 547 U.S. 28 (2006) (No. 04-1329), 2005 WL 2427645). Trident's assertion was untrue, as at the time of the litigation, Independent Ink's product had the "same chemical composition" as Trident's tied product. Trident's claim of varying ink quality does suggest that innovations in ink were possible.

¹⁴² For example, Trident's own customers expressed a desire for "quicker drying ink." Exhibit 24, Joint Appendix, vol. III, *Illinois Tool Works Inc. v. Independent Ink, Inc.*, 547 U.S. 28 (2006) (No. 04-1329), 2005 WL 1865981.

¹⁴³ Exhibit 25, Joint Appendix, vol. III, *Illinois Tool Works Inc. v. Independent Ink, Inc.*, 547 U.S. 28 (2006) (No. 04-1329), 2005 WL 1865981.

¹⁴⁴ See Klein & Wiley, *supra* note 19, at 601–02 ("To make this price discrimination strategy work, however, it was essential that Xerox and Kodak block ISOs from obtaining replacement parts and supplying lower-priced service directly to high-intensity Kodak and Xerox customers.").

¹⁴⁵ BOWMAN, *supra* note 43, at 112.

decreasing returns (in terms of improved incentives) to allowing property owners to capture more of the value from their inventions.”¹⁴⁶

Second, they explain that this uncaptured value represents a spillover and that empirical evidence shows “that firms in high-technology industries (the most innovation-intensive ones) are likely to increase rather than decrease their R&D investment in the face of significant intra-industry spillovers.”¹⁴⁷ In the context of patent tying, many buyers are innovators themselves, who can invest their consumer surplus into research and development. For example, firms that use Trident’s printheads thrived in a wide range of businesses; their principal commonality was that they shipped their products in boxes that had used Trident’s printheads to print labels on them. The consumer surplus these various firms enjoyed by using Trident’s printheads could be invested in innovations completely unrelated to printheads or ink.

Third, the amount of the spillover is not a measure of underinvestment. So long as the reward actually received by the patentee is sufficient, it does not matter how much additional value is left on the table in the form of consumer surplus. Professors Frischmann and Lemley explain:

[I]nventors do not need to capture the full social value of their inventions in order to have sufficient incentive to create. Society needs merely to give them enough incentive to cover the fixed costs of creation that their imitators will not face. Any greater return is at best a mere wealth transfer and at worst wasteful—it doesn’t encourage any more innovation in the field, and it may actually interfere with downstream innovation and distort behavior in the market. Thus, while we need some *ex ante* incentive to innovate, we don’t need (and don’t particularly want) full internalization of the benefits of an invention. As long as we get enough incentive, the fact that other benefits aren’t captured by the innovator doesn’t impose any real cost on innovation, and may even contribute to innovation.¹⁴⁸

In short, the presence of consumer surplus does not represent a flaw in our patent system. It represents a benefit for society that may in turn generate more innovation.¹⁴⁹

3. *The Patentee’s Incentive to Innovate in the Tied Product Market*

When a patentee with monopoly power in the tying product market imposes a tying requirement, it has less incentive to improve the tied product because

¹⁴⁶ Frischmann & Lemley, *supra* note 127, at 258.

¹⁴⁷ *Id.* at 269 (citing Dietmar Harhoff, *R&D Spillovers, Technological Proximity, and Productivity Growth—Evidence from German Panel Data*, 52 SCHMALENBACH BUS. REV. 238, 258 (2000)).

¹⁴⁸ *Id.* at 276.

¹⁴⁹ *See id.* at 258 (“Spillovers do not always interfere with incentives to invest; in some cases, spillovers actually drive further innovation.”).

consumers must already purchase the tied product from it as a result of the tie-in. In non-tying contexts, the monopolist's incentive to innovate is to stay ahead of inventive rivals. With an effective tying arrangement in place, however, the tied product is insulated from such competitive pressures. The tying seller may have incentive to innovate in the tying product market, but not in the tied product market.

The tying seller has less incentive to improve the tied product because the marginal benefit of product improvement is diminished. Posner has argued that if the tying seller has a monopoly in the tying product, it has no incentive to acquire a second monopoly in the complementary market for the tied product.¹⁵⁰ If he is right, then the tying seller has no incentive to innovate in the tied product market because the tying seller can sell the tied product without innovating, and the seller does not gain anything by actually monopolizing the complementary market. Posner, however, overstated the case. A tying seller may have an incentive to monopolize the complementary market for the tied product if there are uses of the tied product separate from its use with the tying product.¹⁵¹ Professors Ordover and Willig explain:

Monopoly power over one component of a system . . . is not always sufficient for a dominant firm to extract all the monopoly profits obtainable in the systems market. In such instances, the dominant firm can increase its profit by inducing the exit of a rival and thereby extending its monopoly power to other systems components.¹⁵²

Thus, the tying seller still has a marginal incentive to acquire monopoly power in the tied product market. Posner's insight still has relevance, though, because the tying seller receives a smaller benefit for improving the tied product since it has already locked up a sizeable portion of the tied product market through the tie-in. In short, the tying seller may have little reason to expend resources on research and development when the incremental gain in market share associated with innovation is slight.

4. *Dual Market Entry, R&D Budgets, and Innovation*

Finally, a tying seller can use a tie-in to stifle competition and innovation in the tied product market by forcing rivals to enter two markets concurrently. In condemning tying arrangements, the Supreme Court has opined that "one of the evils proscribed by the antitrust laws is the creation of entry barriers to potential competitors by requiring them to enter two markets simultane-

¹⁵⁰ POSNER, *supra* note 19, at 198–99 (“[A] fatal . . . weakness of the leverage theory is its inability to explain why a firm with a monopoly of one product would want to monopolize a complementary product as well.”).

¹⁵¹ Whinston, *supra* note 116.

¹⁵² Janusz A. Ordover & Robert D. Willig, *An Economic Definition of Predation: Pricing and Product Innovation*, 91 *YALE L.J.* 8, 31 (1981).

ously.”¹⁵³ Because “entry into both markets is significantly more expensive than simple entry into the tied market,” tying renders markets less competitive.¹⁵⁴

By forcing a rival in the tied product market to enter the tying product market as well, a tie-in can reduce the likelihood of innovation in the tied product market for several related reasons. First, if an entrant in the tied product market must enter both the tying and tied products markets in order to reach minimum efficient scale, then the new contender may not be able to compete because it does not have the experience or resources to enter the tying product market.¹⁵⁵ Furthermore, because of its inexperience, its capital costs will be relatively higher than the tying seller’s costs, which represents an additional barrier to entry.¹⁵⁶

Second, if a competitor must successfully enter two markets in order to compete, then tying can force it to divide its research, development, and marketing budgets across two different products. Tying forces the spreading out of R&D resources; this essentially dilutes the amount of research that can be conducted in the tied product market.¹⁵⁷

Third, specialization is more likely to lead to innovation.¹⁵⁸ If tying induces tied product makers to disperse their research budgets across markets, it can warp competition in the tied product market. In particular, “by forcing every single entrant to spread out its R&D resources among components, bundling distorts specialization decisions and lowers the probability of successful entry.”¹⁵⁹ Economists note that “by distorting the specialization decisions of rivals, bundling inefficiently buttresses the incumbent’s position.”¹⁶⁰

Fourth, having to enter two markets lowers the expected profits from innovation in the tied product market. Investment in research often precedes inno-

¹⁵³ *Eastman Kodak Co. v. Image Tech. Servs., Inc.*, 504 U.S. 451, 485 (1992) (citing *Jefferson Parish Hosp. Dist. No. 2 v. Hyde*, 466 U.S. 2, 14 (1984); *Fortner Enters. v. United States Steel Corp.* (*Fortner I*), 394 U.S. 495, 509 (1969)).

¹⁵⁴ *Jefferson Parish*, 466 U.S. at 13 n.19 (quoting *Fortner I*, 394 U.S. at 512–14 (White, J., dissenting)); see also Leslie, *Tying Arrangements*, *supra* note 29, at 819 (discussing *United States v. United Shoe Machinery Corp.*).

¹⁵⁵ Oliver E. Williamson, *Assessing Vertical Market Restrictions: Antitrust Ramifications of the Transaction Cost Approach*, 127 U. PA. L. REV. 953 (1979).

¹⁵⁶ *Id.*

¹⁵⁷ See SCHMIDT, *supra* note 70, at 41–42 (noting the “argument that tying by a dominant company can suppress innovation on the tied product market, because foreclosure of the product market converts into foreclosure of the R&D market”).

¹⁵⁸ Choi & Stefanadis, *Bundling*, *supra* note 135, at 2588 (“Firms that focus on their core competencies . . . have a higher probability of exhibiting superior performance in their core sectors than diversified companies.”).

¹⁵⁹ *Id.* at 2589–90.

¹⁶⁰ *Id.* at 2576.

vation, the development of a new product, and successful entry into a product market.¹⁶¹ By reducing the incentives for rival firms in the tied product market to invest in research and development, metered tying can diminish the flow of new and better products into the marketplace.¹⁶² Creating uncertainty about the prospects of having and winning a fair fight in the tied product market reduces research and innovation in that market.¹⁶³ If a new firm intent on improving the tied product must enter two markets in order to have a successful presence, then this will reduce the return on the research investment,¹⁶⁴ which makes innovation less profitable and less likely.¹⁶⁵

One could posit that the above arguments against tying arrangements do not apply when the tying product is patented because the tying seller has acquired its market power legitimately and the patent excludes competitors in the tying product market, not the tie-in. There is some truth to this proposition. But the argument is weakened by the possibility of design around. The process of competitors designing around patents is part and parcel of the patent system.¹⁶⁶ Indeed, designing around existing patents is critical to maintaining innovation in a patent-laden free market economy. The Federal Circuit opined that “[o]ne of the benefits of a patent system is its so-called ‘negative incentive’ to ‘design around’ a competitor’s products, even when they are patented, thus bringing a steady flow of innovations to the marketplace.”¹⁶⁷ Tying, however, can reduce the likelihood of design-around. Although they do not discuss design-around explicitly, Choi and Stefanadis’s work—as well as Carlton and Waldman’s analysis—suggest that tying can reduce the incentives

¹⁶¹ Choi & Stefanadis, *Tying*, *supra* note 135, at 52 (“A potential entrant can enter the market if it succeeds in innovation and obtains a superior technology; the probability of success depends on the level of its R&D expenditures.”).

¹⁶² Jay Pil Choi, *Tying and Innovation: A Dynamic Analysis of Tying Arrangements*, 114 *ECON. J.* 83, 83 (2004) (“Tying arrangements prevent competitors from having a fair chance to reach consumers. This market foreclosure translates into reduced R&D incentives for the rival firms. Thus, it is possible that tying arrangements drive better products and services out of the market.”). Choi also suggests that tying can signal a commitment by the tying seller to make a “more aggressive R&D investment in the tied goods market,” which also “has the strategic effect of dulling the R&D incentives of rival firms.” *Id.* at 85.

¹⁶³ Choi & Stefanadis, *Bundling*, *supra* note 135, at 2579 (“By making the prospects of investment less certain, bundling discourages rivals from investing and innovating.”).

¹⁶⁴ Nalebuff, *supra* note 116, at 163 (“Choi and Stefanadis [2001] also rely on a commitment to bundle as a way to deter entry. In their model, A and B are only of any value when consumed together. Thus, an incumbent bundle completely forecloses a one-product entry. Innovation has a lower expected payoff as success in both the A and B good is required to gain access to the market.”).

¹⁶⁵ If there is enough demand for the tied product, independent of its use in conjunction with the tying product, then some firms may enter the former market alone. But fewer firms can do this.

¹⁶⁶ *WMS Gaming, Inc. v. Int’l Game Tech.*, 184 F.3d 1339, 1355 (Fed. Cir. 1999) (“patent law encourages competitors to design or invent around existing patents”).

¹⁶⁷ *State Indus., Inc. v. A.O. Smith Corp.*, 751 F.2d 1226, 1236 (Fed. Cir. 1985).

for rivals to research and design around a patent that serves as a basis for a tying arrangement. If the tying arrangement provides a barrier to entry into the tying product market,¹⁶⁸ then tying seller can reduce incentive of sellers to design around the patent.

C. SUMMARY

When patentees employ metered tying, both the tying seller and its competitors in the tied product market may have less incentive to innovate in the tied product market. The tying seller has less incentive because it can make sales of the tied product without innovating. The competitors in the tied product market have less incentive because the rewards from innovation are diminished.

Competing theories exist about the effects of patent tying on innovation. Each theory accurately describes some industries at some junctures. . But that does not mean that the theories are equally persuasive. The story of how patent tying facilitates innovation is a bit roundabout—the tying seller earns additional profits through price discrimination and may reinvest that money in future innovation. The competing theory of anti-innovation is more causal: the tie-in directly reduces—and perhaps eliminates—the competitors' incentive to improve the tied product. The ultimate question is which theory, if either, explains *more* markets. That is an empirical question that cannot be answered here. However, some economists have concluded that legal restrictions on tying can have a net positive effect on social welfare.¹⁶⁹

In short, metered tying creates greater rewards associated with the patented tying product but does so at the expense of reducing innovation rewards in the tied product market. The overall effect of metered tying may be a net decline in innovation.¹⁷⁰

¹⁶⁸ Carlton & Waldman, *supra* note 34, at 195 (“We assume that the two firms have equivalent primary products in the second period but the alternative producer has a superior complementary product in both periods. In our specification the monopolist has no incentive to tie if there is no threat of entry into the primary market in the second period, but does have such an incentive when such entry is possible.”).

¹⁶⁹ *Id.* at 203 (“when the monopolist has an incentive to tie, a prohibition on tying increases social welfare”).

¹⁷⁰ Choi & Stefanadis, *Tying*, *supra* note 135, at 52 (“We show that when an incumbent monopolist faces the threat of entry in all complementary components, tying may make the prospects of successful entry less certain, discouraging rivals from investing and innovating. Tie-in sales may reduce consumer and total economic welfare.”); *see also* Gee, *supra* note 69, at 295 (“The law should be cautious of ties that may cause a patent in the tying product market to trump another’s innovation in the tied product market.”).

IV. MOVING FORWARD

Some scholars have argued that patentees who impose tying requirements should get some measure of deference from antitrust courts in the name of innovation. Parts II and III question this argument. Yet, even if the innovation arguments in favor of patent tying are overstated, tying law is still overly restrictive. In this Part, I briefly discuss patent tie-ins in the context of antitrust law on tying more generally. I propose treating patent and non-patent tying equally, but under a true rule of reason standard instead of the current nominal *per se* rule, which in practice operates as a truncated rule of reason.

A. APPLY TYING LAW EQUALLY TO PATENT TIE-INS

The fact that some tying arrangements are imposed by patent-holding innovators does not mean that patent tying should receive greater deference under antitrust law. Patents are only sometimes relevant to antitrust law. Most notably, patents provide a defense to Section 2 liability in that acquiring and maintaining a monopoly through legally held patents does not constitute predatory exclusion. But this does not translate into a broad exemption from antitrust liability.¹⁷¹ The Supreme Court has long recognized that the mere possession of a patent provides no exemption from otherwise applicable antitrust laws.¹⁷²

Patentees can violate antitrust laws in a variety of ways. For example, antitrust law condemns agreements among patents to cartelize¹⁷³ or divide markets,¹⁷⁴ bars certain patent pools¹⁷⁵ or patent settlements,¹⁷⁶ and precludes patentees from bringing frivolous patent infringement lawsuits that create or reinforce monopoly power.¹⁷⁷ Most importantly for our purposes, patents do not provide a defense to tying, and Section 3 of the Clayton Act clearly states that patent tying can be illegal.¹⁷⁸ Not even the Federal Circuit's pro-patentee opinion in *Xerox* suggested that tying law did not apply to patent holders.¹⁷⁹

¹⁷¹ See *United States v. Singer Mfg. Co.*, 374 U.S. 174, 196–97 (1963) (“[T]he possession of a valid patent or patents does not give the patentee any exemption from the provisions of the Sherman Act beyond the limits of the patent monopoly.”).

¹⁷² See, e.g., *United States v. Line Materials Co.*, 333 U.S. 287, 308 (1948) (“It is equally well settled that the possession of a valid patent or patents does not give the patentee any exemption from the provisions of the Sherman Act beyond the limits of the patent monopoly.”).

¹⁷³ See, e.g., *United States v. United States Gypsum Co.*, 333 U.S. 364 (1948).

¹⁷⁴ See, e.g., *Hartford-Empire Co. v. United States*, 323 U.S. 386, *clarified by* 324 U.S. 570 (1945).

¹⁷⁵ See, e.g., *Matsushita Elec. Indus. Co. v. Cinram*, 299 F. Supp. 2d 370 (D. Del. 2004).

¹⁷⁶ See, e.g., *In re Cardizem CD Antitrust Litig.*, 332 F.3d 896 (6th Cir. 2003).

¹⁷⁷ See, e.g., *Handgards, Inc. v. Ethicon, Inc.*, 743 F.2d 1282 (9th Cir. 1984).

¹⁷⁸ 15 U.S.C. § 14.

¹⁷⁹ *In re Indep. Serv. Orgs. Antitrust Litig.*, 203 F.3d 1322, 1327 (Fed. Cir. 2000) (“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.”).

Antitrust law should treat patent tie-ins the same way it treats tying arrangements not involving patented products or processes. In their Antitrust Guidelines for the Licensing of Intellectual Property, the Antitrust Division and the Federal Trade Commission promised to “apply the same general antitrust principles to conduct involving intellectual property that they apply to conduct involving any other form of tangible or intangible property.”¹⁸⁰ Scholars, too, have argued that antitrust law should apply the same standards to intellectual and tangible property.¹⁸¹

If patentees were able to impose tying requirements when other sellers cannot, it could result in the former being over-rewarded. As Louis Kaplow has explained:

If patentees, but not others, are permitted to engage in discriminatory practices, price discrimination might enable patentees to recover even more than the total economic surplus generated by their invention without resorting to any disguised cartelization. A patentee would reap this benefit if its price discrimination enabled it to capture not only the surplus generated by its invention, but also the surplus that would have gone to consumers or other producers in the absence of the patentee’s invention.¹⁸²

Kaplow’s reasoning explains another potential effect of patent tying. If patentees were able to implement metered tying without restriction, they could conceivably extract all of the consumer surplus from the patented tying product market and the non-patented tied product market. While the former may be defensible as a matter of economic theory, the latter is not. If antitrust’s rule against tying is to apply equally to patentees and non-patentees, this leads to the important issue of what the test for liability should be.

B. FIX TYING LAW GENERALLY: REQUIRE ANTICOMPETITIVE EFFECTS

Some may object to treating patent tie-ins like other tie-ins because they view antitrust’s treatment of non-patent tying arrangements as too restrictive. But if antitrust’s tying prohibition is too sweeping, the answer is not to give patent holders special deference when they tie simply because they have patents. The better response is to correct tying law more broadly. Tying arrangements can have procompetitive, anticompetitive, or competitively benign effects. Antitrust law should condemn anticompetitive uses of tying arrangements, but it should not proscribe procompetitive and competitively neutral

¹⁸⁰ U.S. Dept. of Justice & Fed. Trade Comm’n, Antitrust Guidelines for the Licensing of Intellectual Property § 2.1 (1995) (“Intellectual property has important characteristics . . . that distinguish it from many other forms of property. These characteristics can be taken into account by standard antitrust analysis, however, and do not require the application of fundamentally different principles.” (footnote omitted)).

¹⁸¹ See, e.g., Shelanski, *supra* note 126.

¹⁸² Kaplow, *supra* note 43, at 1875.

tie-ins. One way to distinguish between anticompetitive and procompetitive or competitively neutral tying arrangements is to require tying plaintiffs to show that the challenged tie-in actually injures competition.

Federal courts characterize tying arrangements as “per se illegal.”¹⁸³ This label, however, is misleading. When an agreement falls into the per se category, this generally relieves the plaintiff of the burden of proving either that the defendant possesses market power or, more importantly, that the challenged agreement unreasonably restrains competition. Furthermore, the defendant is not permitted to present a defense of its restraint on trade—e.g., a legitimate business justification—or to argue that the particular agreement in the case at hand does not injure competition.

Antitrust condemnation of tie-ins lacks the hallmarks of true per se illegality. Before a court will find a tying arrangement per se illegal, the plaintiff must show that the defendant has market power over the tying product¹⁸⁴ and that a not insubstantial dollar volume of commerce in the tied product market is affected.¹⁸⁵ Also, courts have sometimes allowed the defendant an opportunity to argue that a legitimate business reason justifies its imposition of the tie-in.¹⁸⁶ And some circuit courts have formulated their per se standard for

¹⁸³ *Jefferson Parish Hosp. Dist. No. 2 v. Hyde*, 466 U.S. 2, 9 (1984) (“It is far too late in the history of our antitrust jurisprudence to question the proposition that certain tying arrangements pose an unacceptable risk of stifling competition and therefore are unreasonable ‘per se.’”); *In re Sulfuric Acid Antitrust Litig.*, No. 03-CV-04576, 2010 WL 3835869, at *26 (N.D. Ill. Sept. 24, 2010) (“Activities such as horizontal price fixing, market allocation, group boycotts, or tying arrangements are so inherently anticompetitive, they are considered illegal per se. Because these actions are conclusively presumed to be unreasonable, no inquiry into the harm actually caused is required.”) (citations omitted); *St. Francis Med. Ctr. v. C.R. Bard, Inc.*, 657 F. Supp. 2d 1069, 1094 (E.D. Mo. 2009) (“Examples of the per se standard include price fixing, tying arrangements, and group boycotts A plaintiff who has satisfied the per se standard need not prove any anticompetitive effects from the alleged restraint.”) (citations omitted).

¹⁸⁴ *See United States v. Loew’s, Inc.*, 371 U.S. 38, 47–48 (1962).

¹⁸⁵ *See Fortner Enters., Inc. v. United States Steel Corp.*, 394 U.S. 495, 501 (1969); *Station Enters., Inc. v. Ganz, Inc.*, No. 07-CV-14294, 2009 WL 2926572, at *6 (E.D. Mich. Sept. 10, 2009) (“[U]nder current per se analysis, the antitrust plaintiff must show the seller possesses substantial market power in the tying product market and that the arrangement affects a substantial volume of commerce in the tied market.”) (citing *Kodak*, 504 U.S. at 462, 478–79).

¹⁸⁶ *See, e.g., United States v. Jerrold Elecs. Corp.*, 187 F. Supp. 545, 555–60 (E.D. Pa. 1960), *aff’d per curiam*, 365 U.S. 567 (1961); *Mozart Co. v. Mercedes-Benz of N. Am., Inc.*, 833 F.2d 1342, 1348–49 (9th Cir. 1987) (“We have recognized that antitrust defendants may demonstrate a business justification for an otherwise per se illegal tying arrangement.”) (citing *Roberts v. Elaine Powers Figure Salons, Inc.*, 708 F.2d 1476, 1482 (9th Cir. 1983); *Metrix Warehouse, Inc. v. Daimler-Benz Aktiengesellschaft*, 828 F.2d 1033, 1040 (4th Cir. 1987) (discussing “business justification defense” to tying claims); *Roberts v. Elaine Powers Figure Salons, Inc.*, 708 F.2d 1476, 1482 (9th Cir. 1983) (“If a tying arrangement exists, the trier of fact shall determine whether [the defendant] has a business justification excusing it from liability.”); *Betaseed, Inc. v. U and I Inc.*, 681 F.2d 1203, 1225–28 (9th Cir. 1982); *Phonetele, Inc. v. AT&T Co.*, 664 F.2d 716, 738–39 (9th Cir. 1981); *Moore v. Jas. H. Matthews & Co.*, 550 F.2d 1207, 1217 (9th Cir. 1977)); *id.* at 1349 (recognizing business justification as an “affirmative defense” in tying cases); *Cincinnati Sub-Zero Prods., Inc. v. Augustine Med., Inc.*, 800 F. Supp. 1549, 1562 (S.D. Ohio

tying arrangements to require the plaintiff to prove that the challenged tie-in has actual anticompetitive effects.¹⁸⁷ This type of antitrust scrutiny is functionally equivalent to rule of reason analysis. The per se label for tying arrangements is, thus, inappropriate.

Nevertheless, many courts apply their per se rule against tying arrangements in a manner that “dispenses with proof of anticompetitive effects”¹⁸⁸ once the plaintiff establishes market power and that a substantial dollar amount of commerce is affected. This nominal application of the per se rule against tying is overbroad when it does not require proof of anticompetitive effects because many—perhaps most—tie-ins do not injure competition. The Chicago School is correct when it argues that tie-ins should not be treated as per se illegal. Tying does not “always or almost always tend to restrict competition and decrease output,”¹⁸⁹ which is the standard for per se illegality.¹⁹⁰

Courts should apply a rule of reason approach to all tie-ins, thus requiring tying plaintiffs to show an injury to competition. A tying plaintiff can satisfy this requirement by demonstrating anticompetitive effects in either the tying or tied product markets. Under a true rule of reason test, many challenged tying arrangements—whether used for price discrimination or not, and whether the tying product is patented or not—may avoid antitrust liability.¹⁹¹ But if they do not cause antitrust harm, that is the proper result.

1992) (“One method a defendant may employ to legitimize a per se illegal tying arrangement is to demonstrate a business justification for the tying arrangement.”), *abrogated on other grounds* by *Balance Dynamics Corp. v. Schmitt Indus., Inc.*, 204 F.3d 683 (6th Cir. 2000).

¹⁸⁷ See, e.g., *United Farmers Agents Ass’n v. Farmers Ins. Exch.*, 89 F.3d 233, 235 n.2 (5th Cir. 1996). Other courts require a finding that “anticompetitive forcing is likely” before condemning tie-ins as per se illegal. See, e.g., *Datel Holdings Ltd. v. Microsoft Corp.*, 712 F. Supp. 2d 974, 999 (N.D. Cal. 2010) (discussing *Jefferson Parish Hosp. Dist. No. 2 v. Hyde*, 466 U.S. 2, 15–16 (1984)).

¹⁸⁸ *Ganz, Inc.*, 2009 WL 2926572, at *6 (citing *PSI Repair Services, Inc. v. Honeywell, Inc.*, 104 F.3d 811, 815 n.2 (6th Cir.1997)); see also *In re Insurance Brokerage Antitrust Litig.*, 618 F.3d 300, 317 n.13 (3d Cir. 2010) (“[t]he ‘per se’ rule against tying goes only halfway [because] . . . if the defendant is found to have market power [in the tying product], the plaintiff is, in theory, relieved of proving actual harm to competition”) (quoting *Town Sound & Custom Tops, Inc. v. Chrysler Motors Corp.*, 959 F.2d 468, 477 (3d Cir.1992) (en banc)).

¹⁸⁹ *Northwest Wholesale Stationers, Inc. v. Pac. Stationery & Printing Co.*, 472 U.S. 284, 289–90 (1985) (quoting *Broadcast Music, Inc. v. CBS, Inc.*, 441 U.S. 1, 19–20 (1979)).

¹⁹⁰ The Chicago position, however, goes too far when it advocates per se legality for tie-ins. See, e.g., Bork, *supra* note 40, at 380–81; Frank Easterbrook, *Vertical Arrangements and the Rule of Reason*, 53 ANTITRUST L.J. 135, 143–45 (1984); See William H. Page, *The Chicago School and Evolution of Antitrust: Characterization, Antitrust Injury, and Evidentiary Sufficiency*, 75 VA. L. REV. 1221, 1223 (1989) (noting that Chicago scholars argue for per se legality of tie-ins).

¹⁹¹ HOVENKAMP, *supra* note 32, at 123 (“Most tying arrangements are efficient mechanisms for organizing distribution of one’s good or service in order to increase consumer satisfaction, prevent free riding, or meter the use of intellectual property rights.”).

Under a rule of reason approach, competitors excluded from the tied product market would be appropriate plaintiffs if they could show that the defendant's tying injured competition. The lost sales of rival sellers in the tied product market arguably constitute an antitrust injury.¹⁹² The presence of a patent over the tying product does not negate this. Chicago School adherents may argue that if tying gets the patentee more money, it is a transfer of wealth. We must ask, however, from whom the wealth is being transferred and whether such a transfer is appropriate. It may be that the transfer of wealth from consumers of the tied bundle to the patentee is justifiable because the consumers presumably benefit from the patented invention and from their consumption of the bundle. But part of the transfer comes from excluded sellers of the unpatented tied product, who are making fewer sales and perhaps being driven from that product market altogether. These sellers should not be subsidizing the patent holder because they are neither infringing the patent nor benefitting from it.¹⁹³

C. A PRICE DISCRIMINATION DEFENSE TO PATENT TYING?

This leaves the issue of what role the price discrimination explanation should play under a true rule of reason approach to tying claims. Commentators argue that “the fact or possibility of price discrimination does not itself provide grounds for condemning tie-ins.”¹⁹⁴ At the same time, however, the possibility of price discrimination should not immunize a tie-in that is objectionable because of its proven anticompetitive effect. To the extent that the rule of reason entails balancing, if there is an anticompetitive effect, what should it be balanced it against? Some would argue innovation. Patent tying advocates like Bowman suggest that the greater money to the patentee provided through price discrimination rewards innovation and encourages further innovation. But this defense proves too much—every illegal act done by a patentee is designed to increase its profits.¹⁹⁵ More importantly, in Part III, I provided many reasons to be suspicious of these innovation arguments in general.

Proponents of the Chicago School have argued that antitrust law should not condemn patent tying when it is used to facilitate price discrimination.¹⁹⁶ This

¹⁹² Grill, *supra* note 47, at 1483 (discussing arguments from *Illinois Tool Works* case).

¹⁹³ Perhaps sellers of complementary products would be gaining something if consumers of the patented product increased their purchases of complementary products from them, but the tying arrangement prevents this.

¹⁹⁴ 9 PHILLIP AREEDA & HERBERT HOVENKAMP, ANTITRUST LAW ¶1711c (2d ed. 2004).

¹⁹⁵ See *supra* notes 94–95 and accompanying text.

¹⁹⁶ Posner, *supra* note 32, at 330–31 (“Since the law permits price discrimination (with immaterial exceptions), there is no reason why it should forbid tie-ins and thus force sellers to resort to less efficient means of discrimination—if they were more efficient, a prohibition would be un-

position, however, fails to consider that tying can injure competition in the tied product market and inflict injury on rival sellers through sales lost on the basis of competition on the merits. The patentee has every right to maximize its return on the patented product so long as it does not engage in patent misuse or violate any non-patent laws, including antitrust laws. For example, owners of intellectual property can price discriminate. Software companies charge different prices to different customer classes.¹⁹⁷ This form of price discrimination does not distort competition in the markets for complementary goods.¹⁹⁸ The ability to price discriminate in some forms does not translate into an affirmative right to price discriminate in all forms, particularly in the form of metered tying that injures competition in the tied product market.

Instead, antitrust properly constrains how patentees can price discriminate. Patent owners already have a variety of ways to engage in price discrimination that do not distort competition in markets beyond the scope of the patent. Most simply, they can charge different prices to different buyers. This may not always be possible given the risk of arbitrage. To minimize this risk, “[i]n markets protected by IP, sellers often segment their buyers based on line of business, location, field of technology, or whether the use is not-for-profit. They implement this segmentation through contract terms that specify allowable uses. The usual goal of this marketing strategy is price discrimination.”¹⁹⁹ Patentees can also restrict the frequency of use,²⁰⁰ as the patentee did in *Mallinckrodt Inc. v. Medipart Inc.*²⁰¹ when it limited the buyers of its medical devices to a single use, presumably to prevent reconditioned devices from being sold in a secondary market.²⁰²

necessary—unless the tie-in has a sinister purpose, which is the exceptional, not the normal, case.”).

¹⁹⁷ See, e.g., *ProCD v. Zeidenberg*, 86 F.3d 1447, 1449 (7th Cir. 1996) (“ProCD decided to engage in price discrimination, selling its database to the general public for personal use at a low price (approximately \$150 for the set of five discs) while selling information to the trade for a higher price.”).

¹⁹⁸ Sellers of complementary goods may have to reduce their prices because as the price paid for one good goes up, the demand for complementary goods goes down. This is how normal markets function; it is not a suppression of competition.

¹⁹⁹ *Meurer*, *supra* note 16, at 1877 (“For example, DuPont imposed a field of use restriction and charged different prices for a patented synthetic fiber depending on the end use intended by the customers.”) (citing *Akzo v. United States Int’l Trade Comm’n*, 808 F.2d 1471, 1488 (Fed. Cir. 1986)).

²⁰⁰ *Id.* at 1890 (“IP law bolsters frequency of use restrictions by adding infringement claims and strong IP remedies to the breach of contract claims. Infringement claims are well grounded in patent law because the patent owner has broad control over use.”).

²⁰¹ 976 F.2d 700 (Fed. Cir. 1992).

²⁰² See *Meurer*, *supra* note 16, at 1899 (discussing *Mallinckrodt* and noting that the court found the single-use requirement to be a “valid contract term and enforced the restriction despite an objection that the restriction violated the exhaustion doctrine”).

Similarly, a patent owner can price discriminate while evading antitrust liability if the patentee directly meters usage instead of using a tie-in. Direct metering is permissible because the patentee is extracting the higher price for the patented product, not another product outside of the scope of the patent. If a patent owner cannot meter directly, then it may be out of luck because Congress explicitly condemned patent tying that substantially lessens competition. Alternatively, a patentee can peg its licensing fees to a licensee's output. Indeed, the patentee can receive payments for all output, including that which does not incorporate its patents.²⁰³ It is improper, however, for the patentee to force consumers to buy a product outside of the scope of the patent in a manner that injures competition. In short, while a patent owner is allowed to meter in order to effect price discrimination, it cannot distort competition in the market for the tied product as part of its metering scheme.

So long as the elements of a tying claim (including anticompetitive effects) are proven, then the fact that the patentee was using the tie-in as a metering device should be irrelevant. The patent holder has the right to exclude competitors and charge any price it chooses. We tolerate monopoly pricing in the patented product because the supracompetitive price is being paid by consumers who are directly benefiting from the patented product (which may not have been developed but for the prospect of monopoly pricing). The patent holder's reward, however, should come by excluding competitors from the market in which the patented product competes, not from complementary markets outside the scope of the tying seller's patent. Metering through tying inflicts a cost on firms that do not purchase or directly gain from the patented product.²⁰⁴ In a tied product market unconstrained by patents, it is simply anathema to free competition that a patent in another product market should serve as a barrier to entry in the tied product market. If the patent holder injures competition in a complementary market in a manner that antitrust law condemns, then the presence of the patent over the tying product provides no defense because the tied product market lies outside of the scope of the patent.

V. CONCLUSION

The relationship between consumer welfare and innovation may require some hard decisions to be made about what trade-offs should occur among competing virtues. With respect to patent tying used to effect price discrimination, if anticompetitive tie-ins that eliminate consumer surplus are defended based on innovation arguments, those defenses need to be vigorously vetted.

²⁰³ *Automatic Radio Mfg. Co. v. Hazeltine Research, Inc.*, 339 U.S. 827 (1950).

²⁰⁴ To the extent that the tying product is complementary to the tied product and, if desirable, should increase the demand for the tied product, then makers of the tied product do receive additional revenue from the popularity of the tying product. But this alone does not justify eliminating these firms from selling the tied product to customers subject to the tying requirement.

If the elimination of consumer surplus increases innovation, then we have to decide whether the trade-off is worth it. If, on the other hand, patent tying eliminates consumer surplus without improving innovation, then there is less reason to tolerate anticompetitive tie-ins.

Patent tying has been illegal for almost a century since the congressional enactment of the Clayton Act in 1914. Yet, where is the evidence of diminished innovation? Money spent on research increases every year, as does the number of patents issued. Firms innovate and patent their inventions despite antitrust's prohibition on tying.²⁰⁵ This would suggest that tying does not deter research. Innovation is a function of many variables. It is not clear whether the ability to use metered tying in a manner that injures competition in the tied product market is a meaningful driver for innovation. To the extent that metered tying facilitates innovation, it bears noting that a proper antitrust regime will only condemn those metered tie-ins that injure competition. This is a narrow subset of patent tying. There is no evidence that this particular subset of tie-ins is necessary to stimulate, encourage, and reward innovation in the marketplace. Yet there is reason to believe that patent tying will reduce innovation.²⁰⁶

At a minimum, given competing theories, supporters of metered tying should have to demonstrate the increases in innovation they claim.²⁰⁷ There should also be some effort to see how pro-tying theories apply across different industries to ensure that the overall effect is pro-innovation and that any examples are not atypical.²⁰⁸ Legal doctrine should not be transformed based on theory alone.²⁰⁹

²⁰⁵ See, e.g., SCOTCHMER, *supra* note 10, at 203 (“There was a 71 percent increase in patent grants from 1978 to 1995.”).

²⁰⁶ See *supra* Part III.

²⁰⁷ See Baker, *supra* note 80, at 648 (“the net effect of the refusals to deal on industry-wide incentives to innovate is not obvious”).

²⁰⁸ *Id.* at 647 (“The dynamic efficiency effects of allowing price discrimination also cannot be determined as a matter of theory, as the practice might enhance industry innovation incentives in some respects while reducing them in others.”).

²⁰⁹ See Christopher R. Leslie, *Rationality Analysis in Antitrust*, 158 U. PA. L. REV. 261 (2010).