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ANTITRUST AND THE MOVEMENT OF TECHNOLOGY

*Herbert Hovenkamp**

INTRODUCTION

Determining the proper role of antitrust in high-technology markets is daunting for a number of reasons. First, the antitrust statutes provide little help. They identify restraints of trade, monopolization, or practices that may lessen competition in only the most general terms.¹ The Sherman and Clayton Acts do not refer to high technology, innovation, or even intellectual property law except for a single reference to patented goods in Section 3 of the Clayton Act.² Neither do the statutes exclude them, however, and few people believe that antitrust should have no place in the formation of policy for high-technology markets.³

Second is the problem of interaction between antitrust and intellectual property law, particularly patent law, which has always presented difficult problems of boundary management. By and large, high-technology markets are also IP-intensive markets, although some of them, such as information technologies, are also markets where the patent system often lets us down.⁴ Indeed, today there are good reasons for thinking that antitrust is doing a better job within its domain than much of intellectual property law is doing in its.⁵

Antitrust's duty is not to increase rivalry for its own sake, but rather to encourage market behavior that will increase economic welfare. Problematically, the effects produced by innovation and those produced by competition in price and quantity often pull against each other. Antitrust is generally dedicated to incentivizing competitive output and pricing, which are mainly short-run concerns. By contrast, intellectual property policy awards above-cost returns in order to provide incentives to innovate, an essentially long-run concern.

Another important difference is that innovation is so badly behaved when compared to the relatively smooth transitions that traditional price theory finds for competitive processes under constant technology. Firms

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¹ See 15 U.S.C. §§ 1-2, 13-14 (2006).

² *Id.* § 14.

³ See *id.* §§ 1-2, 13-14.

⁴ See CHRISTINA BOHANNAN & HERBERT HOVENKAMP, CREATION WITHOUT RESTRAINT: PROMOTING LIBERTY AND RIVALRY IN INNOVATION 104, 106 (2012).

⁵ *Id.* at 33-35, 38-39.

build plants and capacity goes up, so prices go down. New firms enter or existing firms exit, and prices decline or increase accordingly. Indeed, the entire notion of equilibrium in neoclassical economics presupposes relatively smooth flowing responses from output to price, or vice versa.

In sharp contrast, innovation often produces very sudden and quite unpredictable results. It can completely kill an industry in a few years, as electronic calculators did to slide rules in the 1960s. In the process, it can bring an entirely new industry into existence in an equally short time.⁶ It can produce results far different than researchers expected, such as the blockbuster drug Viagra, which was the culmination of a research project seeking a treatment for angina, not for erectile dysfunction.⁷ Innovation can produce sudden and dramatic shifts in prices or output and almost instantly expand the range of consumer choices. As a result, predicting and managing competitive processes in highly innovative industries is much more difficult than in markets where technology is very largely constant and most movements affect only the output and price of a set of unchanging products.

Another challenge to antitrust in high-technology markets is that so much of innovation is nonrivalrous. On the supply side, one person's consumption of it does not deplete the amount that is left for others. This fact entails a significantly stronger role for collaboration in innovation, but it also produces other consequences. One is that restraints on output are more suspicious in IP collaborations than in more traditional production joint ventures.⁸ Another is that dominant firms or groups of firms often have incentives to engage in practices that restrain rather than promote innovation.⁹

Yet another feature that makes innovation complex is that strong IP rights can make output much "lumpier" than it is in traditional markets. In markets for manufactured products without significant IP protection, high price-cost margins induce new entry and the resulting increase in output brings prices down toward the competitive level. The new entry may be costly, but it will occur if anticipated payoffs justify the risk and expense. For example, if incumbent firms operate cement plants with public domain technology, new entrants can copy the structures of existing firms. While entry is costly, it will typically occur up to the point that anticipated post-entry prices drop to cost. Indeed, competitiveness in the neoclassical sense depends on the ability of new entrants to copy the production of incumbents. The model of perfect competition, which presupposes fungible products, also presupposes copying.

⁶ See *id.* at 240-41.

⁷ See MEIKA LOE, THE RISE OF VIAGRA: HOW THE LITTLE BLUE PILL CHANGED SEX IN AMERICA 41-42 (2004).

⁸ See discussion *infra* Part I.B.

⁹ See BOHANNAN & HOVENKAMP, *supra* note 4, at 238, 240, 244-47, 250.

Intellectual property rights often do not behave in such a continuous fashion. In the absence of IP protection, copying is often quick and cheap, leading to the virtually instantaneous movement of prices to short-run marginal cost, with insufficient return to justify the innovation investment. This is strongly true for such things as digital media, but it can also be true for many process patents. By contrast, when a strong IP right is recognized, copying may simply become unlawful, foreclosing competitive entry at any price. Of course, in the real world we rarely see such all-or-nothing results for two reasons. First, few IP rights are so strong that they foreclose every possible entry alternative. Instead, we typically see the emergence of product-differentiated markets. Second, licensing can facilitate entry, and today a great deal of technology is licensed to competitors. Universal cross licensing of the technology for making a fungible product could yield something very close to perfect competition, depending on license terms.¹⁰ By contrast, universal refusal to license would produce monopoly in a few extreme cases, but mainly it would produce differentiation and a fairly substantial amount of monopolistic competition among rivals.¹¹

Antitrust has relatively little to say about the ways in which technology is initially created, whether by patent, copyright, trade secret, or simply first-mover advantages. Even the patentee who defrauds the patent office in order to obtain its patent does not generally violate the antitrust laws simply by getting the patent. In general, patents are characterized by a great deal of government agency supervision during the patent-granting process, but almost no supervision once the patent has been granted.

An antitrust offense, if any, almost always lies in post-issuance collaborations or in the use of patents to restrict market entry.¹² That is, antitrust has a much bigger role to play in decisions about how intellectual property, once acquired, moves or fails to move from one firm to another. Both licensing and refusals to license have produced large amounts of antitrust doctrine. Historically, a great deal of this doctrine was implicitly based on models of price competition that did a very poor job of taking the complicating factors produced by innovation and intellectual property rights into account.¹³ Antitrust challenges to licensing among competitors have been concerned primarily with various forms of collusion or boycott. Practices concerning refusals to license are concerned mainly with anticompetitive

¹⁰ See discussion *infra* text accompanying notes 46-48.

¹¹ See discussion *infra* Part II.

¹² See, e.g., *Walker Process Equip., Inc. v. Food Mach. & Chem. Corp.*, 382 U.S. 172, 174, 177 (1965) (noting that infringement action based on fraudulently obtained patent could violate the antitrust laws). On the full range of *Walker Process* claims, see 3 PHILLIP E. AREEDA & HERBERT HOVENKAMP, *ANTITRUST LAW* ¶ 706 (3d ed. 2008).

¹³ See *ANTITRUST, INNOVATION, AND COMPETITIVENESS* vii, 7-11 (Thomas M. Jorde & David J. Teece eds., 1992).

exclusion. The balance of this Article addresses antitrust concerns in these two very broad areas.

Part I of this Article discusses collaborative development of technology and the idea of the IP commons. It continues by addressing output and access restrictions in the commons as well as the issue of pooling worthless patents. Part I concludes with a discussion of tying and foreclosure with respect to pooled patents. Part II discusses the no-duty-to-share principle in patent law and offers solutions meant to facilitate innovative competition.

I. COLLABORATIVE PRODUCTION AND THE INNOVATION COMMONS

Intellectual property rights create strong incentives for collaborative development. IP rights are nonrivalrous, which means that at the production end, one firm's use does not deplete the amount left over for others. This stands in sharp contrast to the collaborative production of rivalrous goods, such as oil and gas or fish, where the incentive to overuse is both strong and damaging to the supply of the right-producing asset. The principal hindrance to collaborative development of rivalrous goods is that collaboration tends to sever the link between investment and appropriation. To the extent that people's ability to take out is not related to the amount they put in, we will see overproduction. For example, unrestrained fishermen on a common pond will spend too many resources taking fish out and too few on restocking and management.¹⁴ For this reason, a relatively small amount of traditional production is organized as commons. Most firms own the means of production exclusively, and their ability to produce depends entirely on their own willingness to invest.¹⁵

Collaborative development and licensing of technology is encouraged by a number of interrelated phenomena. First, for many technologies, fixed costs are extremely high in relation to variable costs. Once technology is developed, it can be used an infinite number of times without depleting what is left over. That is to say, the same factors that make intellectual property nonrivalrous across two or more economic persons also provide significant returns to scale for research and development ("R&D"). As a result, technology sharing very significantly reduces costs. The high-risk nature of many innovation programs serves to magnify this effect, because firms that share the costs of innovation can more easily absorb the costs of failure. For example, if a single firm launches a \$100 million research effort to develop a new flat panel display screen, it must bear the entire loss if the venture fails to produce a marketable product. If five firms jointly launch or finance the same effort, however, each one will assume only one-fifth of the

¹⁴ See Harold Demsetz, *Toward a Theory of Property Rights*, 57 AM. ECON. REV. 347, 354 (1967).

¹⁵ See BOHANNAN & HOVENKAMP, *supra* note 4, at 327-31.

cost of failure. Further, if the venture succeeds in producing a patentable product, each firm can produce all it wants. How much each firm produces will depend on competitive market demand, or else on any output restriction that the firms might employ, either expressly in their license agreement or else through express or tacit collusion on the side. In sum, significant cost savings can accrue to collaborating firms, both if the venture fails and if it succeeds.

A second feature of technology that encourages collaborative development is the need for interoperability or common standards. A hallmark of a great deal of innovation is networking and interconnectivity. Products must be designed in such a way that they can interconnect with one another, or else they must be compatible with a common set of inputs. Compatibility usually does not happen by itself; it must be achieved. This can happen in a number of ways. For example, firms might independently develop incompatible products and then fight with one another for competitive acceptance. A prominent example from the nineteenth century was the dispute over railroad track gauges, which finally came to an end when the United States began chartering transcontinental railroads and insisted on a standard gauge.¹⁶ This was also true of the war over VHS and Betamax as videotape formats in the 1980s, and also of the more recent fight between Blu-ray and HD DVD.¹⁷ In each case, rival firms developed alternative formats and fought for consumer acceptance.¹⁸ Alternatively, firms might collaborate in advance on a single format, thus saving the cost of multiple development, although doing so would mean giving up some of the competitive trial and error by which markets identify preferred products.

A networked world need not be a world of monopolists. Multiple firms provide many large networks, firms that both compete with each other and offer complementary products. This is true of telecommunications, the Internet, electronic banking and credit card services, electricity, and natural gas.¹⁹ But networks can function only if the firms share common standards for products and systems, and typically these standards result from collaboration of firms that show up in the market as competitors. The collaborations promise considerable social gain, but they also raise the potential for competitive harm in either of two ways. First, the firms might fix output or price unreasonably, perhaps using exclusion devices as a facilitator. Second, they might channel or restrain innovation unreasonably. That is to

¹⁶ See HERBERT HOVENKAMP, *THE ANTITRUST ENTERPRISE: PRINCIPLE AND EXECUTION* 284 (2005).

¹⁷ BOHANNAN & HOVENKAMP, *supra* note 4, at 358.

¹⁸ See HOVENKAMP, *supra* note 16, at 279-80 (discussing the battle for market dominance between VHS and Sony, which produced Betamax video recorders and tapes).

¹⁹ See YOCHAI BENKLER, *THE WEALTH OF NETWORKS: HOW SOCIAL PRODUCTION TRANSFORMS MARKETS AND FREEDOM* 285-89 (2006). On telecommunications networks, see DANIEL F. SPULBER & CHRISTOPHER S. YOO, *NETWORKS IN TELECOMMUNICATIONS: ECONOMICS AND LAW* 15 (2009).

say, networks can create positive externalities that require some deference,²⁰ or market two-sidedness that can complicate analysis of pricing and output.²¹ But these are qualifications to the way that antitrust should be applied rather than indicators that antitrust is useless in networked markets.²²

Agreements facilitating collaborative innovation can also facilitate collaborative restraints on output or price. To be sure, there is no necessary link. Agreements for joint R&D or standard setting define a set of *inputs*, while price or quantity limitations or territorial or product market divisions are restraints on *output*. For example, the fact that a group of automobile manufacturers have developed an emission control system jointly does not entail that they must agree on how many units each participant will produce or what price it will charge. Unrestrained, each could produce as many cars with the new system as they wished, right up to the competitive level of output.

The task that antitrust policy confronts is to permit collaboration to achieve the cost savings and interoperability that collaborative innovation promises, while searching out and policing restrictions on output or price that are both competitively harmful and unnecessary to achieve these goals, or that restrain the legitimate innovations of rivals.

A. *Antitrust Policy on the IP Commons*

A commons is a resource that is used most effectively when it is shared. Traditional commons include such things as fishing, grazing, or water rights, or underground pools of oil or natural gas that have multiple surface owners.²³ Commons production is preferred either because significant scale economies accrue to joint development or else because the cost of sharing is lower than the cost of identifying and defending individual boundaries. Traditional commons are rivalrous, meaning that use by one person takes away from the amount that is left over for others—a common characteristic of individually held property rights. For example, if ten ranchers share grazing rights in a certain pasture, each additional cow takes away grass that would otherwise be available to someone else. As a result, the ranchers will almost certainly have to agree about how many cattle each rancher can graze on the commons. Overuse depletes the supply.

²⁰ See, e.g., George L. Priest, *Rethinking Antitrust Law in an Age of Network Industries* 2-3 (John M. Olin Ctr. for Studies in Law, Econ. & Pub. Policy, Research Paper No. 352, 2007), available at http://papers.ssrn.com/sol3/papers.cfm?abstract_id=1031166.

²¹ See, e.g., David S. Evans, *The Antitrust Economics of Multi-Sided Platform Markets*, 20 YALE J. ON REG. 325, 325-26 (2003).

²² See BOHANNAN & HOVENKAMP, *supra* note 4, at 299-319.

²³ See ELINOR OSTROM, *GOVERNING THE COMMONS: THE EVOLUTION OF INSTITUTIONS FOR COLLECTIVE ACTION* 61-67 (1990) (describing the tradition of common grazing grounds in Switzerland and Japan).

In contrast to traditional commons, intellectual property commons are almost always nonrivalrous on the supply side. If ten producers own the rights to make a product covered by a patent, each one can make as many units as it pleases without limiting the number that others can make.²⁴ If the ten producers are acting competitively and producing a commodity, they will increase production all the way to the competitive level. Considered ex post, that might seem to be a good thing, but considered ex ante it may not give the producers the correct incentive to develop the patented technology in the first place. That is, the costs of innovating the product are fixed and may not be reflected in a competitive post-innovation regime in which prices are driven to short-run costs.

Nevertheless, the fact remains that output restrictions perform a different function in nonrivalrous commons from the one that they perform in a rivalrous commons. In a rivalrous commons for, say, fishing rights, catch limits are necessary to prevent individual overfishing. Otherwise, each participant will have an incentive to take out as much as possible, leaving others to bear the expense of restocking and maintenance. As a result, there is nothing suspicious about a commons management rule that limits individual fishermen to, say, one hundred of a particular species per day.

But the patent pool has no close equivalent of overfishing on the supply side, because the supply is infinite. Rather, the problem is congestion externalities on the output side, or the possibility of overproduction in relation to fixed costs. Perhaps Justice Story realized this in *Brooks v. Byam*,²⁵ when he ordered a group of persons who collectively owned rights in a patent for friction matches to engage in joint production.²⁶ However, the sixteenth century common law decision he relied on, *Lord Mountjoy's Case*,²⁷ involved rivalrous goods.²⁸

Fundamentally, the rationale for innovation commons, such as patent pooling, is no different than the rationale for the pooling of rivalrous goods, such as fishing or grazing rights. The rationale is the same one that applies to the structure of firms generally. In his well-known 1937 article on *The Nature of the Firm*, Ronald Coase argued that the boundaries of a firm lie along the line where the cost of internal production is just equal to the cost of market procurement.²⁹ If it is cheaper to purchase something than to make that thing for oneself, the firm will buy.³⁰ If self-production is cheaper

²⁴ See HERBERT HOVENKAMP, *INNOVATION AND COMPETITION POLICY*, ch. 9, at 29 (2011), available at http://papers.ssrn.com/sol3/papers.cfm?abstract_id=1952091.

²⁵ 4 F. Cas. 261 (C.C.D. Mass. 1843) (No. 1,948).

²⁶ *Id.* at 271.

²⁷ (1582) 78 Eng. Rep. 11 (K.B.).

²⁸ HOVENKAMP, *supra* note 24, at 4.

²⁹ R.H. Coase, *The Nature of the Firm*, 4 *ECONOMICA* 386, 394-95 (1937); see also Herbert Hovenkamp, *Coase, Institutionalism, and the Origins of Law and Economics*, 88 *IND. L.J.* 499, 529 (2011).

³⁰ See Coase, *supra* note 29, at 394-95.

or produces better results, it will make.³¹ The sum of all of these decisions defines the boundaries of the firm and, coordinately, of the market in which the firm procures inputs from other firms. That is, a market is a group of firms that each face lower costs when trading inside than when going outside.³²

The decision to share a productive asset such as a fishery or a patent rests on the same principles. Individual ownership has costs—namely, the costs of identifying and enforcing individual boundaries. Collective ownership also has costs—namely, the costs of bringing investment and production incentives into alignment as they would be under individual ownership. If boundaries are unambiguous and relatively cheap to defend, as they are in most cases involving tangible property, the incentive effects of individual ownership make it more profitable in most cases. As boundaries become more difficult to locate or the costs of defending them increase, however, the costs of coordinating investment and production on a commons may make it an attractive alternative. Fishing on a public or commonly owned pool is an obvious example because fish are mobile and the cost of placing and maintaining effective underwater boundaries is extremely high. A more profitable solution is for the fishermen with access rights to develop a regime in which both the number of fish taken out and the amount invested in restocking and development emulate what a single firm would do. The commons manager can then develop individual catch and contribution rules that divide these entitlements and obligations among the participants.

Because these decisions are based on the costs of supplying a particular asset, outcomes will range widely from one market to another. Further, commons management within a market will be effective for some assets but not for others. For example, ownership and maintenance of fishing boats do not encounter the same boundary problems that pertain to the fish themselves. As a result, one would expect to see a form of industrial organization evolve in which fishermen entrepreneurs owned and maintained their boats individually but did their fishing in a common pool.

Owners of intellectual property rights organize them into commons for several reasons. First, the fact that IP rights are not common pool resources in the traditional sense but are nonrivalrous goods serves to make management as a commons easier. The manager need not be concerned about exhausting the supply.

Second, such rights are often subject to very low marginal cost and significant economies of scale. Once a new patented technology is developed it can be used an infinite number of times, which means that economies of scale in the technology itself may far exceed economies of scale in physical production or distribution. For example, if an R&D project result-

³¹ *Id.* at 394.

³² See Herbert Hovenkamp, *Coasean Markets*, 31 *EUR. J.L. & ECON.* 63, 64 (2011), available at <http://www.springerlink.com/content/65031035h363g164/fulltext.pdf>.

ing in patents for a certain technology cost \$10 million to develop, these costs amortized over 100,000 units would be \$100 per unit, but they would be only \$10 per unit if they could be amortized over 1,000,000 units. In that case, a group of competing firms that shared the technology via a pool or other licensing arrangement could produce at a far lower cost than if each firm had to develop its own technology individually.

One would expect to see more use of licensing, including pools, as production economies of scale are modest. In such cases, production economies of scale suggest the viability of small firms, while the sharing of technology serves to reduce input costs over the entire market. For example, a patent pool covering an automobile production system would have a small number of firms because economies of scale in auto production, which is rivalrous, generally dictate that the producers of the vehicles themselves be very large. In contrast, the patent pool covering MPEG-2 video technology includes some 1,400 firms making a wide variety of devices that produce, store, or display video in MPEG formats.³³ A blanket licensing agreement for music performance rights, such as Broadcast Music, Inc., includes more than 7 million songs representing some half-million artists.³⁴ This is because the economies at the licensing level favor a very comprehensive licensing library, while at the production level most bands or orchestras record fewer than a half-dozen songs per year.

Third, a common feature of technology is an increased need for interoperability. The need tends to be greatest in markets for information technologies such as telecommunications and Internet technology, as well as computer hardware and software. It is less pronounced in markets such as pharmaceuticals and chemicals.³⁵ As noted before, the fact that an industry is a network does not dictate monopoly, and competitive networks can be made to function quite effectively. For example, the economic performance of the telephone industry improved significantly when we realized that, while we needed universal protocols for interconnection and compatibility, the actual production of the various segments, such as instruments

³³ See *MPEG-2 Licenses*, MPEG LA, <http://www.mpegla.com/main/programs/M2/Pages/Licensees.aspx> (last visited July 14, 2012) (listing 1,424 licensees and affiliates in the MPEG-2 pool). The patents cover technologies for video and audio representation and compression for use on electronic storage media such as hard drives or flash cards.

³⁴ See *About BMI*, <http://www.bmi.com/about/entry/538061> (last visited July 11, 2012); see also *Broad. Music, Inc. v. Columbia Broad. Sys., Inc.*, 441 U.S. 1, 1 (1979).

³⁵ Setting aside genetic patents, where multiple complementary licenses may be necessary for research. See Kyle Jensen & Fiona Murray, *Intellectual Property Landscape of the Human Genome*, 310 *SCIENCE* 239, 239 (2005); see also Michael A. Heller & Rebecca S. Eisenberg, *Can Patents Deter Innovation? The Anticommons in Biomedical Research*, 280 *SCIENCE* 698, 699 (1998); Courtney C. Scala, *Making the Jump from Gene Pools to Patent Pools: How Patent Pools Can Facilitate the Development of Pharmacogenomics*, 41 *CONN. L. REV.* 1631, 1635 (2009).

and many distribution functions, could be organized competitively.³⁶ The real problem with the Telecommunications Act of 1996³⁷ is not that it failed to recognize the value of competition. Rather, its global interconnection obligations extend even to portions of the market that could otherwise be structured quite competitively without any need to share productive assets.³⁸ To the extent that the Act gives small firms a right to share assets that could readily be produced competitively, it hinders rather than furthers development.³⁹

Fourth, to the extent that separately owned intellectual property rights function as complements, sharing is often the best way to achieve efficient production. This fact is not very different in principle from the situation of any producer who procures complementary goods from other firms. For example, an automobile may have 5,000 complementary parts. A large automobile manufacturer such as Ford will manufacture some of these and purchase others depending on the relative payoff. The unification of complementary patents into a single product largely follows the same course. If a firm has its own best technology for some components, it will employ it. If its technology is inferior for other components or if it has no technology for them at all, it will license from others. The line of equipoise represents the difference between the cost of internal IP ownership and the cost of IP licensing from outside. For this reason, the attitude of the antitrust laws toward patent pooling is justifiably more tolerant when the shared patents are complements rather than substitutes.⁴⁰ This explains why an often given justification for certain patent pools is that they involve “blocking” patents, which are patents whose claims conflict with one another such that one cannot be practiced without infringing the other.⁴¹

Patent blocking relationships are complementary with respect to the particular claims that block, although the patents may be substitutes with respect to other claims. For example, the prolonged *Philips/Princo*⁴² litiga-

³⁶ See 3B AREEDA & HOVENKAMP, *supra* note 12, ¶¶ 785-87; see also SPULBER & YOO, *supra* note 19, at 233-48.

³⁷ Telecommunications Act of 1996, Pub. L. 104-104, 110 Stat. 56 (codified as amended in scattered sections of 47 U.S.C.).

³⁸ See 47 U.S.C. § 251(a) (2006) (originally enacted as Pub. L. 104-104, § 251, 110 Stat. 56, 62 (1996)).

³⁹ See *id.* § 251(b).

⁴⁰ Richard J. Gilbert, *Antitrust for Patent Pools: A Century of Policy Evolution*, 2004 STAN. TECH. L. REV. 3, ¶¶ 13-25 (2004).

⁴¹ See *U.S. Philips Corp. v. Int'l Trade Comm'n*, 424 F.3d 1179, 1192 (Fed. Cir. 2005) (asserting blocking as rationale for pooling); *Int'l Mfg. Co. v. Landon, Inc.*, 336 F.2d 723, 729 (9th Cir. 1964) (holding that it was permissible for firm to tie blocking patents); Mark A. Lemley, *The Economics of Improvement in Intellectual Property Law*, 75 TEX. L. REV. 989, 1009-10 (1997); Josh Lerner & Jean Tirole, *Efficient Patent Pools*, 94 AM. ECON. REV. 691, 691 (2004); Robert Merges, *Intellectual Property Rights and Bargaining Breakdown: The Case of Blocking Patents*, 62 TENN. L. REV. 75, 80 (1994).

⁴² *Princo Corp. v. Int'l Trade Comm'n*, 616 F.3d 1318 (Fed. Cir. 2010) (en banc), *cert. denied*, 131 S. Ct. 2480 (2011).

tion involved patents with blocking claims even though the technologies in the underlying patents were substitutes.⁴³ One technology covered an analog method of locating the writing point on a rewritable optical disc, while the other technology covered a digital method for doing the same thing.⁴⁴ Although a licensee would use one technology or the other, indicating that the patents were primarily substitutes rather than complements, at least one claim in the digital patent was thought to block the analog technology.⁴⁵

Pooling of complementary patents can also address double marginalization problems when licenses must otherwise be obtained from separate sources. Double marginalization occurs when separate firms selling complementary products each have some market power, are unable to pool their output, and each assesses a profit-maximizing output rate individually.⁴⁶ Under quite robust assumptions, the profit-maximizing output is higher if a single firm offers the complements together or the two firms can coordinate their output by licensing together.⁴⁷ The benefit accrues both to consumers in the form of lower prices, and to producers in the form of higher output. Eliminating double marginalization explains many instances of tying and also of the kind of joint licensing that can result from pooling arrangements.⁴⁸

⁴³ *Id.* at 1323, 1326.

⁴⁴ *Id.* at 1322.

⁴⁵ *Id.*, where the pooled patents provided alternative digital and analogue solutions to a problem, but at least one claim in the digital patent blocked the technology described by the analogue patent; *cf.* *Wright Co. v. Herring-Curtiss Co.*, 204 F. 597 (W.D.N.Y. 1913), *aff'd*, 211 F. 654 (2d Cir. 1914), where the Wright patent described “wing warp,” which stabilized and steered a plane by twisting flexible wings. The Curtiss technology used hinged ailerons at the trailing edge of rigid wings that could be made of metal. *Id.* at 606. The two technologies were substitutes in that a manufacturer would choose one or the other but not both. Nevertheless, the Curtiss technology was found to infringe the Wright patent under a broad reading of the doctrine of equivalents, thus rendering the patents blocking. *Id.* at 614; *see also* U.S. DEP’T OF JUSTICE & FED. TRADE COMM’N, ANTITRUST GUIDELINES FOR THE LICENSING OF INTELLECTUAL PROPERTY § 5.5 (1995), *available at* <http://www.justice.gov/atr/public/guidelines/0558.pdf> (providing an example and analysis of cross-licensing and blocking patents); 2 HERBERT HOVENKAMP ET AL., IP AND ANTITRUST: AN ANALYSIS OF ANTITRUST PRINCIPLES APPLIED TO INTELLECTUAL PROPERTY LAW §§ 34.2c, at 34-7 (Supp. 2011).

⁴⁶ W. KIP VISCUSI, JOSEPH E. HARRINGTON, JR. & JOHN M. VERNON, *ECONOMICS OF REGULATION AND ANTITRUST* 238-39 (4th ed. 2005).

⁴⁷ *See id.* at 238-41 (describing and analyzing a “classic” case of vertical integration); JEAN TIROLE, *THE THEORY OF INDUSTRIAL ORGANIZATION* 174-75 (1988) (describing double marginalization of complements).

⁴⁸ *See* Erik Hovenkamp & Herbert Hovenkamp, *Tying Arrangements and Antitrust Harm*, 52 ARIZ. L. REV. 925, 959 (2010) (explaining how tying can eliminate double marginalization); Mark A. Lemley & Carl Shapiro, *Patent Holdup and Royalty Stacking*, 85 TEX. L. REV. 1991, 2013-14 (2007) (describing the relationship between double marginalization and complementary patents). For the relevant mathematical analysis, *see* Erik Hovenkamp & Herbert Hovenkamp, *Tying Arrangements*, in OXFORD INTERNATIONAL HANDBOOK OF ANTITRUST ECONOMICS (forthcoming 2012), *available at* http://papers.ssrn.com/sol3/papers.cfm?abstract_id=1999063.

But in today's patent world these reasons for cross licensing or other pooling arrangements are hardly the whole story. Economies of scale, interconnectivity, and complementarity explain only a portion of the procompetitive rationale for pooling. A great deal of pooling in many markets, particularly those for information and electronic technologies, is a function of boundary defects in the patent system. Many patents cover only trivial advances over prior art, thus chopping property rights into tiny pieces. Claims are often drafted in overly broad ways, often designed to obfuscate rather than clarify the rights they create.⁴⁹ The problem is particularly serious in electronic and information technologies. When the costs of identifying and defending individual boundaries are high in relation to the costs of sharing, firms will develop communal systems for organizing their production.

The problem of many patents is ambiguous and involves potentially overlapping coverage, making patent boundaries very costly to defend.⁵⁰ Many patent pools were formed only after years of costly patent infringement litigation, which the pool finally settled.⁵¹ Litigation is nothing other than the cost of identifying and defending boundaries, and when these costs become too high in relation to the costs of joint administration, then pooling begins to make more economic sense. Given the ubiquity of patent boundary problems in certain market areas, this rationale for pooling applies when patents are substitutes as well as when they are complements. It also applies in markets in which interconnectivity and compatibility needs are not particularly high.

⁴⁹ See generally BOHANNAN & HOVENKAMP, *supra* note 4, at chs. 4, 5 & 12.

⁵⁰ The Supreme Court recently observed the problem in *Mayo Collaborative Servs. v. Prometheus Labs., Inc.*, 132 S. Ct. 1289, 1302 (2012) (“One problem with [process] patents is that the more abstractly their claims are stated, the more difficult it is to determine precisely what they cover. They risk being applied to a wide range of situations that were not anticipated by the patentee.” (alteration in original) (quoting BOHANNAN & HOVENKAMP, *supra* note 4, at 112)).

⁵¹ See, e.g., *United States v. Glaxo Grp., Ltd.*, 410 U.S. 52, 54 (1973) (patent pool to resolve litigation between firms owning alternative technologies); *United States v. Singer Mfg. Co.*, 374 U.S. 174, 177-78 (1963) (settlement agreement involved pooling plus exclusion); *United States v. New Wrinkle, Inc.*, 342 U.S. 371, 373-74 (1952) (cross licensing with price restrictions); *Hartford-Empire Co. v. United States*, 323 U.S. 386, 394-95, *clarified by* 324 U.S. 570 (1945) (horizontal customer restrictions); *United States v. Masonite Corp.*, 316 U.S. 265, 268-69, 271 (1942) (cross licensing with price restrictions); *Noll v. O.M. Scott & Sons Co.*, 467 F.2d 295, 297 (6th Cir. 1972) (per curiam) (conveyance of disputed patent to trustee to licensee out); *Duplan Corp. v. Deering Milliken, Inc.*, 444 F. Supp. 648, 675 (D.S.C. 1977), *aff'd in relevant part*, 594 F.2d 979 (4th Cir. 1979); *United States v. Huck Mfg. Co.*, 227 F. Supp. 791, 797-98 (E.D. Mich. 1964), *aff'd by an equally divided court*, 382 U.S. 197 (1965) (settlement included cross licensing with price restrictions); see also 12 PHILLIP E. AREEDA & HERBERT HOVENKAMP, *ANTITRUST LAW* ¶ 2046 (3d ed. 2012); Carl Shapiro, *Navigating the Patent Thicket: Cross Licenses, Patent Pools, and Standard Setting*, in NAT'L BUREAU OF ECON. RESEARCH, 1 INNOVATION POLICY AND THE ECONOMY 119, 142-44 (Adam B. Jaffe et al. eds., 2001).

B. *Output and Access Restrictions*

Some pools are nothing more than fronts for collusion. Others may have justifications but simultaneously create opportunities for unreasonable output restrictions. Most of the patent pooling arrangements that have been condemned under the antitrust laws involved explicit restraints on price or output that may or may not have been necessary to the proper functioning of the pool.⁵² Further, most of these restraints operated in the product market rather than the market for the patent rights themselves, including such things as resale price maintenance, territorial or product market divisions, or price fixing of product output.⁵³

Commons for rivalrous goods such as grazing rights or fisheries could not survive without limiting output. The classical “tragedy” of the commons is that when participants do not bear the full cost of their use, they will use too much because excessive use without maintenance reduces their own short-run costs.⁵⁴ Even the common law recognized this and created rules that required joint operation in cases where a resource was shared but no stated limit was placed on each person’s rights.⁵⁵ In pools for rivalrous goods, restrictions are essential limitations on the overuse of commons capacity and not intended to cartelize markets. This is evidenced by the fact that the vast majority of rivalrous commons are very small in relation to the market in which their production is sold, meaning that output collusion is not a likely explanation for the output restriction. Even a very large commons for grazing on a common pasture or taking fish out of a common pond would produce only a miniscule share of the market for these particular commodities, which are typically sold in a much larger market than is encompassed by the pool.⁵⁶ As a result, there should not be any presumption

⁵² See *infra* note 53.

⁵³ *E.g.*, *New Wrinkle*, 342 U.S. at 378 (patent pooling agreements not to compete violate antitrust laws); *United States v. Line Material Co.*, 333 U.S. 287, 312-15 (1948) (price fixing illegal where two patentees cross license each other’s patents); *Hartford-Empire*, 323 U.S. at 413-18 (a cartel may be forced to license pooled patents to competitors for a reasonable royalty); *Princo Corp. v. Int’l Trade Comm’n*, 616 F.3d 1318, 1331 (Fed. Cir. 2010) (en banc), *cert. denied*, 131 S. Ct. 2480 (2011) (horizontal agreement between pool licensors did not violate antitrust laws); *Valley Drug Co. v. Geneva Pharm., Inc.*, 344 F.3d 1294, 1304 (11th Cir. 2003) (noncompete agreement between name-brand and generic drug manufacturers was not per se illegal); see 12 AREEDA & HOVENKAMP, *supra* note 51, at ¶¶ 2041-44.

⁵⁴ See Garrett Hardin, *Tragedy of the Commons*, 162 SCIENCE 1243, 1244 (1968). For more technical treatment, see Ilya Segal & Michael D. Whinston, *Property Rights*, in HANDBOOK OF ORGANIZATIONAL ECONOMICS (Robert Gibbons & John Roberts eds., 2012).

⁵⁵ See BOHANNAN & HOVENKAMP, *supra* note 4, at 326-29.

⁵⁶ One cannot rule out the possibility of monopsony power in small local markets. For example, fishermen might join together to lease fishing rights in a local lake, creating a bilateral monopoly or giving them the power to suppress the price. See Seth Korman, *International Management of a High Seas Fishery: Political and Property-Rights Solutions and the Atlantic Bluefin*, 51 VA. J. INT’L L. 697,

that an output restriction asserted by those managing a commons for a rivalrous good is anticompetitive.

Nonrivalrous goods such as patents are different, however. On the supply side, each producer can use a shared patent as much as it pleases without limiting the amount available for others to use. Further, a great many patent pools, including many that the Supreme Court has considered, appeared to include firms that collectively represented a significant portion of the output market.⁵⁷ As a result, production increases by one firm can impose costs on other members of the pool; however, these are the costs that we ordinarily associate with competition. That is, if you and I are fellow members in a patent pool, your output increase may force me to charge a lower price for my product. In an unrestrained pool for a fungible product, firms behaving competitively would increase their output to the competitive level. The principal value of output limitations in pools for nonrivalrous goods such as patents is that they enable firms to earn higher returns on their output.

Of course, if a single firm owned all of the patents in question, it would be able to reduce output to a level that reflects whatever market power it has. At the other extreme, royalty-free cross licensing without any restrictions could yield the competitive rate of output. So how should antitrust policy decide the appropriate level of restraint in a case such as, say, *Bement v. National Harrow Co.*,⁵⁸ in which cross-licensing patentees of agricultural harrows fixed the minimum price at which the harrows were to be sold?⁵⁹

Antitrust's rule of reason should be applied to legitimately ancillary restraints, which may include market divisions, concerted refusals to deal, and sometimes even price restraints. Our premise in using the rule of reason, however, is to seek out restraints that tend to *increase* output by reducing costs or improving product quality.⁶⁰ The purpose of the rule of reason

731-33 (2011) (suggesting such a monopsony in the market for Atlantic Bluefin fishing rights); Fred O. Boadu, Bruce M. McCarl & Dhazn Gillig, *An Empirical Investigation of Institutional Change in Groundwater Management in Texas: The Edwards Aquifer Case*, 47 NAT. RESOURCES J. 117, 120-22 (2007) (similar; water rights).

⁵⁷ Litigated pools which appear to have had dominant or at least significant market shares include *United States v. Singer Mfg. Co.*, 374 U.S. 174, 176 (1963) (sole remaining domestic producer of zigzag sewing machines for household use); *New Wrinkle*, 342 U.S. at 373-74; *Line Material*, 333 U.S. at 290 (40.77% of all cutouts manufactured and sold by defendant were produced under the patents at issue); *United States v. Nat'l Lead Co.*, 332 U.S. 319, 339 (1947); *Standard Sanitary Mfg. Co. v. United States*, 226 U.S. 20, 35 (1912); *Bement v. Nat'l Harrow Co.*, 186 U.S. 70, 88 (1902); *Keeler v. Standard Folding Bed Co.*, 157 U.S. 659, 660 (1895); *In re Gypsum Antitrust Cases*, 565 F.2d 1123, 1124 (9th Cir. 1977); *United States v. Hartford-Empire Co.*, 46 F. Supp. 541, 550 (N.D. Ohio 1942), *modified by* 323 U.S. 386 (1945).

⁵⁸ 186 U.S. 70 (1902).

⁵⁹ *Id.* at 72.

⁶⁰ *E.g.*, *Broad. Music, Inc. v. Columbia Broad. Sys., Inc.*, 441 U.S. 1, 7-8 (1979); *Princo Corp. v. Int'l Trade Comm'n*, 616 F.3d 1318, 1336 (Fed. Cir. 2010); *Golden Bridge Tech., Inc. v. Motorola, Inc.*,

is not to identify the “correct” amount of monopoly return that the members in a patent pool should be earning.

In any event, product differentiation in the output market will typically be sufficient to eliminate the problem of returns that are driven to short-run marginal cost. This is particularly likely to be true if the pooled technology is a relatively minor component in the overall value of the output product. For example, numerous digital camera manufacturers, including large ones such as Kodak, Panasonic, and Canon, are in the MPEG LA licensee pool for video compression technology.⁶¹ But these firms make highly distinguishable cameras with different features, performance capabilities, and pricing that ranges from below \$100 to several thousand dollars. As a result, each firm in the pool is very likely able to charge prices higher than short-run marginal cost.⁶² Further, the MPEG royalty runs from approximately \$2 per unit, or typically not more than 1 percent of the product’s retail price.⁶³ Cross-licensing pools for undifferentiated products sold under highly competitive conditions are rare or perhaps nonexistent.⁶⁴

In both its *Bement* and 1926 *United States v. General Electric Co.*⁶⁵ decisions, the Supreme Court indicated that the members of a patent pool should be entitled to set the product price.⁶⁶ The apparent rationale was that the protections given by the patent laws are intended to meter the correct amount of innovation, and an explicit cartel selects the same output and price as a single firm.⁶⁷ As a result, a group of patentees and licensees

547 F.3d 266, 271 (5th Cir. 2008); see also PHILLIP E. AREEDA & HERBERT HOVENKAMP, ANTITRUST LAW ¶ 2043 (Supp. 2012).

⁶¹ See *MPEG-2 Licensees*, supra note 33.

⁶² Both monopolistically competitive markets, which are characterized by low entry barriers, and oligopolistic product-differentiated markets can have equilibria that accommodate significant fixed costs. See Michael Spence, *Product Selection, Fixed Costs, and Monopolistic Competition*, 43 REV. ECON. STUD. 217, 234 (1976). In general, higher fixed costs are associated with a greater degree of differentiation and a smaller number of firms that the market is able to support. See Avinash K. Dixit, *Some Reflections on Theories and Applications of Monopolistic Competition*, in THE MONOPOLISTIC COMPETITION REVOLUTION IN PERSPECTIVE 123, 129-30 (Steven Brakman & Ben J. Heijdra eds., 2004); JEFFREY M. PERLOFF, MICROECONOMICS: THEORY AND APPLICATIONS WITH CALCULUS 485-86 (2008). In the pure Chamberlin model, easy entry price is at average total cost, which includes fixed as well as variable costs. For a graphic illustration, see Craig Marcott, *Cost and Revenue for Monopoly and Monopolistic Competition*, WOLFRAM DEMONSTRATIONS PROJECT, <http://demonstrations.wolfram.com/CostAndRevenueForMonopolyAndMonopolisticCompetition> (last visited July 14, 2012).

⁶³ See *MPEG-2 License Agreement Summary*, MPEG LA, <http://www.mpegla.com/main/programs/M2/Pages/Agreement.aspx> (last visited July 14, 2012) (permitting individual licensees to negotiate other terms).

⁶⁴ A possible exception is patent pools for products that are essentially commodities, such as memory chips.

⁶⁵ 272 U.S. 476 (1926).

⁶⁶ *Id.* at 488; *Bement v. Nat’l Harrow Co.*, 186 U.S. 70, 72 (1902).

⁶⁷ *Gen. Elec.*, 272 U.S. at 490 (“When the patentee licenses another to make and vend, and retains the right to continue to make and vend on his own account, the price at which his licensee will sell will necessarily affect the price at which he can sell his own patented goods. It would seem entirely reasona-

should be able to set the monopoly price or output level. For example, if a monopolist of a patented widget would set output at 1,000 units, yielding a price of \$10 each, then it should be able to license a group of firms and insist that each one charge \$10 or that aggregate output be 1,000 units.⁶⁸ If several firms own patents and engage in cross licensing, the same outcome should apply.

The fallacy in this reasoning is that it confuses *patent* value with the value of collusion in the product market. The fact is that we do not know what the monopoly price and output would be. Permitting the firms to collude on product price effectively predicates the value of the entire cartel markup to the patents, when in fact the value of patents on product prices can range from very substantial to virtually nil. This is particularly true when patents are either relatively minor or of dubious value.⁶⁹ For example, I might own a perfectly valid patent for a relatively minor improvement in

ble that he should say to the licensee, 'Yes, you may make and sell articles under my patent, but not so as to destroy the profit that I wish to obtain by making them and selling them myself.' He does not thereby sell outright to the licensee the articles the latter may make and sell, or vest absolute ownership in them. He restricts the property and interest the licensee has in the goods he makes and proposes to sell.").

⁶⁸ See *Bement*, 186 U.S. at 91-93 ("On looking through these licenses we have been unable to find any conditions contained therein rendering the agreement void because of a violation of that act. There had been, as the referee finds, a large amount of litigation between the many parties claiming to own various patents covering these implements. Suits for infringements and for injunction had been frequent, and it was desirable to prevent them in the future. This execution of these contracts did in fact settle a large amount of litigation regarding the validity of many patents as found by the referee. This was a legitimate and desirable result in itself. The provision in regard to the price at which the licensee would sell the article manufactured under the license was also an appropriate and reasonable condition. It tended to keep up the price of the implements manufactured and sold, but that was only recognizing the nature of the property dealt in, and providing for its value so far as possible. This the parties were legally entitled to do. The owner of a patented article can, of course, charge such price as he may choose, and the owner of a patent may assign it or sell the right to manufacture and sell the article patented upon the condition that the assignee shall charge a certain amount for such article."); *Gen. Elec.*, 272 U.S. at 490 ("The patentee may make and grant a license to another to make and use the patented articles, but withhold his right to sell them. . . . If the patentee goes further, and licenses the selling of the articles, may he limit the selling by limiting the method of sale and the price? We think he may do so, provided the conditions of sale are normally and reasonably adapted to secure pecuniary reward for the patentee's monopoly. One of the valuable elements of the exclusive right of a patentee is to acquire profit by the price at which the article is sold. The higher the price, the greater the profit, unless it is prohibitory. When the patentee licenses another to make and vend, and retains the right to continue to make and vend on his own account, the price at which his licensee will sell will necessarily affect the price at which he can sell his own patented goods. It would seem entirely reasonable that he should say to the licensee, 'Yes, you may make and sell articles under my patent, but not so as to destroy the profit that I wish to obtain by making them and selling them myself.' He does not thereby sell outright to the licensee the articles the latter may make and sell, or vest absolute ownership in them. He restricts the property and interest the licensee has in the goods he makes and proposes to sell.").

⁶⁹ See, e.g., *Garretson v. Clark*, 111 U.S. 120, 121-22 (1884) (refusing to allow the entire value of the mop as damages in a case involving patent infringement of a relatively minor patent for a device that clamped the mop to the handle).

an office stapler's ability to reduce jamming. You might own a relatively minor but valid patent that enables the stapler to be loaded more easily. Each patent might in a competitive stapler market add \$0.25 to the value of a stapler. But if we collectively controlled the entire market we might fix the price of the staplers at \$3 above the competitive price. Or, to say this somewhat differently, price fixing and output allocation agreements in patent pools effectively permit the firms to attribute the entire value of the cartel markup on the finished product to the patents in question. The *Bement* decision effectively did that.⁷⁰ A market division agreement could do the same thing to the extent that it gave each firm a protected area (in geographic or product space) in which it had market power.

Naked restraints such as price fixing in the product market tend to move the price from the pre-restraint level toward the monopoly level, quite aside from the value of any patent licenses that might be involved. A patent confers such power only rarely. For that reason, the principle established in *Bement* and *General Electric* seems wrong even aside from questions about patent validity. Indeed, if all harrow manufacturers were involved in the pool, the price fix would yield the same price and output whether or not the patents had any value. The price would be lower only to the extent that patent invalidity known to outsiders increased the threat of entry.

C. *Pooling Worthless Patents*

The discussion to this point assumes that pooling involves valid patents with positive value. Patents of dubious validity increase the likelihood that a pool is being used as a screen for collusion. But there is another explanation for pools that applies quite aside from questions of validity. This explanation largely cuts across both substitutes and complements and can apply to markets that do not exhibit a significant need for cross-product connectivity or compatibility. Often patents are pooled because the problem of identifying and defending their boundaries is so significant that the patents are worthless or—as Professors James Bessen and Michael Meurer suggest—may even have negative value, even though they are perfectly valid as patents under existing patent doctrine.⁷¹

Suppose that a patent thicket in a certain market results in widespread infringement litigation, a common occurrence in the history of patent pools. The patents are minor and/or difficult to interpret, creating significant boundary problems that result in costly claim construction proceedings. In many areas, but particularly in information technologies, the costs of obtaining and later defending or enforcing these patents may be greater than

⁷⁰ *Bement*, 186 U.S. at 93-95.

⁷¹ JAMES BESSEN & MICHAEL J. MEURER, PATENT FAILURE: HOW JUDGES, BUREAUCRATS, AND LAWYERS PUT INNOVATORS AT RISK 141 (2008).

the value that the patents add to the products in question.⁷² Indeed, licensees have been heard to complain that it is difficult and costly for them even to determine which patents in a pool are necessary to their production.⁷³ Often these pools contain thousands of patents, only a few of which may be “essential” for a licensee’s product.⁷⁴ The patents themselves are, of course, public records; the principal problem lies in identifying the relevant ones and interpreting them.⁷⁵ In such situations, royalty-free cross licensing can

⁷² *Id.* at 140-42.

⁷³ *E.g.*, *Nero AG v. MPEG LA, L.L.C.*, No. 10-CV-3672-MRP-RZ, 2010 WL 4366448, at *2 (C.D. Cal. Sept. 14, 2010) (noting plaintiff’s allegation that it “would be prohibitively time-consuming and expensive” for it to determine which of 800 patents in a pool were essential to its technology).

⁷⁴ *See* *Apple, Inc. v. Motorola Mobility, Inc.*, No. 11-CV-178-BBC, 2011 WL 7324582, at *11 (W.D. Wis. June 7, 2011) (containing allegation that Motorola failed to disclose patents that it stated were essential to smartphone technology); *Nero AG v. MPEG LA, L.L.C.*, No. 10-CV-3672-MRP-RZ, 2010 WL 4878835, at *2 (C.D. Cal. Nov. 24, 2010) (rejecting licensee’s antitrust complaint that MPEG added “hundreds” of nonessential patents and noting that MPEG charged prospective licensees \$8,500 per patent to determine which patents were essential to the licensee’s technology); *cf.* *Barnes & Noble, Inc. v. LSI Corp.*, No. C-11-2709-EMC, 2012 WL 359713, at *10 (N.D. Cal. Feb. 2, 2012) (finding as a preliminary matter that there was a duty to disclose patents created by membership in standard setting organization); *Apple, Inc. v. Samsung Elecs. Co.*, No. 11-CV-01846-LHK, 2011 WL 4948567, at *4-6 (N.D. Cal. Oct. 18, 2011) (rejecting for pleading defects an antitrust claim that firm failed to disclose essential patents to standard setting organization and failed to abide by reasonable license terms); *Vizio, Inc. v. Funai Elec. Co.*, No. CV-09-0174-AHM, 2010 WL 7762624, at *4-7 (C.D. Cal. Feb. 3, 2010) (dismissing part and sustaining part of antitrust claim against firm that allegedly reneged on commitment to license essential patents on fair and reasonable terms). On the meaning of “essential” patents, see *Koninklijke Philips Elecs. N.V. v. Cinram Int’l Inc.*, 603 F. Supp. 2d 735, 737 (S.D.N.Y. 2009).

⁷⁵ *See, e.g.*, *Texas Instruments, Inc. v. Hyundai Elecs. Indus.*, 49 F. Supp. 2d 893, 901 (E.D. Tex. 1999) (“The product in question would have to be examined in detail and compared to the elements of the claims of the patent in question. Depending on the type of product, this product examination could take several months and costs tens of thousands of dollars—all to evaluate a single product against a single patent. For parties with large semiconductor patent portfolios like Texas Instruments and Hyundai, what is the solution? Enter the patent portfolio cross-license agreement. The portfolio license is widely used in the semiconductor industry because it is almost impossible on a patent-by-patent, country-by-country, product-by-product basis to determine whether someone is using a company’s patents in a given country and provide protection for patents not yet issued. First, under a patent-specific license agreement, the parties have an extremely difficult time tracking the sales that should be included in the royalty base. This difficulty arises from the fact that the holder of a patent is entitled to receive royalties for items sold both directly and indirectly into the country where the patent exists. Parties to license agreements track indirect sales in order to receive full and fair value for their patents. If parties look only at direct sales, they are not receiving fair value for their patents. Tracking sales that come into a specific country is exceedingly difficult, for the party trying to track indirect sales has to know not only where the other party is selling its products, but also the identity of the purchasers in order to determine the likelihood that those products would come into a country where the other party has patents. Second, worldwide license rights are necessary in the semiconductor market because the semiconductor market is a worldwide market. Companies in the semiconductor market do not have the luxury of selling only in one country. Third, for parties with large patent portfolios like Texas Instruments and Hyundai, it is impossible to examine the entire portfolio on a patent-by-patent, country-by-country basis for all possible products. Finally, it is impossible to determine whether a specific product is ‘covered by’ a patent without litigation. By using this expansive cross-license agreement mechanism—the portfolio license—

profit the participants by bringing the value of patents *up to zero*. Under the agreement, each firm can produce freely without worrying about an infringement suit from other pool members. That is, the pool effectively backs its participants out of a patent system that is harmful to them, at least with respect to rights among themselves.

The value of the patent system will still be impaired, however, to the extent that the pool needs to defend itself against patentees who are not members of the pool, and in particular nonpracticing entities. Conversely, patents held by pool members may still have some value against nonmembers of the pool, particularly those nonmembers that do not own patents. They will have to defend their own technology from the pool's infringement suits. As a result, they will have an incentive either to join the pool or to acquire their own patents of negative value, for no other reason than to provide an offset and induce the pool members to bring them into the pool as well. Thus, firms develop "defensive" patenting strategies of acquiring patent portfolios, not to practice or license out, but rather as bargaining chips in the event of infringement suits.⁷⁶

The social costs of this collection of practices are substantial. First are the significant costs of operating an economically useless system for acquiring the patent rights in the first place. The cost is not only the negative value of the patents, but also the considerable administrative costs of creating and litigating them. Then are the significant costs of creating and operating a pool that is designed, to the extent feasible, to reverse the consequences of overpatenting. In short, often firms can profit by "contracting out" of the patent system, so to speak, by entering into cross-licensing agreements that reduce or even eliminate the opportunities under which they will assert patent infringement claims against one another.⁷⁷

Fundamentally, these are not so much antitrust problems as they are problems of regulatory design. Large numbers of negative value patents reflect a serious problem in the patent system, but participants in such industries must take the system as they find it. Fixing the patent system is not antitrust's purpose or legitimate enterprise.

A related problem concerns single firms that fail to give other members of a pool adequate and timely notice of patent rights. This often occurs in the context of standard setting in IP-intensive areas. The courts have not been particularly helpful because they get the notice problem precisely backwards. As a general proposition, the cost of giving notice is much smaller than the cost of searching through a large number of records. For

mammoth companies in the semiconductor industry like Texas Instruments and Hyundai avoid the costly and inefficient endeavor of a patent-by-patent licensing scheme.").

⁷⁶ See FED. TRADE COMM'N, TO PROMOTE INNOVATION: THE PROPER BALANCE OF COMPETITION AND PATENT LAW AND POLICY 6-7, 33-36, 52-55 (2003), available at <http://www.ftc.gov/os/2003/10/innovationrpt.pdf>.

⁷⁷ See BOHANNAN & HOVENKAMP, *supra* note 4, at 341-44.

this reason, the real property system requires landowners to record their interests in such a manner that landowners whose rights are affected will be able to find them. Further, as a general proposition, the less tangible the interest, the more subsequent developers need to rely on the record. Nevertheless, the D.C. and Federal Circuits have held that a patentee did not violate a disclosure duty because a standard-setting organization in which the patentee was participating failed to assess disclosure of patents as a requirement of membership.⁷⁸ The correct rule should be that a patentee *always* has a duty to disclose its patents relevant to standard setting in which the patentee is involved, and the penalty for not doing so is loss of enforcement rights vis-à-vis the members of that organization for any actions taken prior to the time adequate notice is given.⁷⁹ To return to the real property analogy, if a group of landowners were contemplating a common development, we would not rely on the group's "notice policy" in order to determine whether one member could later assert a preexisting nondevelopment covenant against the others. It could do so only if the covenant were properly recorded in a manner such that a reasonable title search would have found it or if the other members had actual notice. The reasons for applying such a rule in patent law are much, much greater than they are in real property.

D. *Tying and Foreclosure*

Package licenses can present opportunities for anticompetitive foreclosure, which, in the case of pooled patents, may also facilitate collusion. Strictly speaking, a "pool" is a set of patentees who cross license—that is, who license their respective patents to one another. By contrast, a "package license" is an arrangement in which multiple patents are grouped into a single package for licensing purposes, and typically the licensor(s) either refuses to license the patents individually or else will do so only at a higher royalty rate. As an antitrust matter, this gives package licenses some of the same attributes as tying arrangements. For example, the Patent Misuse Reform Act combines the two by speaking of a patent owner who "condition[s] the license of any rights to the patent or the sale of the patented product on the acquisition of a license to rights in another patent or purchase of a separate product."⁸⁰ That is to say, both ties of patent and product or ties of one patent to another patent are treated the same way. The statute

⁷⁸ *Rambus Inc. v. FTC*, 522 F.3d 456, 467-69 (D.C. Cir. 2008); *Rambus Inc. v. Infineon Techs. AG*, 318 F.3d 1081, 1096-98 (Fed. Cir. 2003); *accord Barnes & Noble*, 2012 WL 359713, at *10; *Samsung Elecs.*, 2011 WL 4948567, at *5.

⁷⁹ See Herbert Hovenkamp, *Response, Notice and Patent Remedies*, 88 TEX. L. REV. SEE ALSO 221, 230-33 (2011).

⁸⁰ 35 U.S.C. § 271(d)(5) (2006).

goes on to state that such conditioning does not violate the Patent Act unless the seller “has market power in the relevant market for the patent or patented product on which the license or sale is conditioned.”⁸¹ Many large established patent pools also engage in package licensing to outsiders. For example, the MPEG-2 patent pool has about thirty owner-cross licensors, who in turn license to about 1,500 manufacturing licensees of the MPEG package.⁸²

In package licensing, anticompetitive foreclosure can occur because licensees of a pool can use any patent within the pool at a marginal cost of zero. For example, once a licensee obtains rights to a package of patents *A, B, C . . . n*, the *C* patent has already been bought and paid for. A rival might have a patent covering an alternative technology, *C'*, which it would like to sell to this licensee and the licensee may prefer it. However, it is hard to compete with a price of zero. As a result, including *C* in the pool can have the effective result of excluding technology *C'*.⁸³ This could operate as either a price restraint to the extent that it removes *C'* from competition, or else as a restraint on innovation to the extent that it excludes a superior technology from the market.

This problem is fundamentally different, however, from the problem of the licensee who claims that a particular patent is merely unnecessary to its production.⁸⁴ The latter problem is simply a complaint that the licensee would like to have a smaller package than the one that is offered. But the transaction costs of identifying the precise coverage of numerous patents, as well as the costs of individually tailoring packages to cover the needs of diverse licensees are considerable, to say nothing of monitoring costs to determine that the licensees are in fact using only the patents that they licensed.⁸⁵ As a result, the claim that a package contains a merely “unwanted” patent is meaningless as far as competition policy is concerned.

Antitrust claims to the effect that packages contain unwanted patents should be limited to situations in which the licensee can point to a specific technological alternative that is foreclosed by the package in question. Recognizing an antitrust right for tying of a patent that is merely “unwanted”

⁸¹ *Id.*

⁸² See *MPEG-2 Licensors*, MPEG LA, <http://www.mpegla.com/main/programs/M2/Pages/Licensors.aspx> (last visited July 14, 2012); *MPEG-2 Licensees*, *supra* note 33.

⁸³ Of course, it will not exclude *C'* if the incremental value that the licensee places on *C'* over *C* exceeds the price of *C'*.

⁸⁴ See, e.g., *U.S. Philips Corp. v. Int'l Trade Comm'n*, 424 F.3d 1179, 1187-90 (Fed. Cir. 2005) (permitting package licensing agreement including both essential and nonessential patents because it did not bar the licensee from using alternative technologies); *Nero AG v. MPEG LA, L.L.C.*, No. 10-CV-3672-MRP-RZ, 2010 WL 4878835, at *2 (C.D. Cal. Nov. 24, 2010) (rejecting claim that MPEG pool violated antitrust laws because it included unnecessary patents).

⁸⁵ *Cf. Broad. Music, Inc. v. Moor-Law, Inc.*, 527 F. Supp. 758, 762-63, 767-68 (D. Del. 1981) (rejecting tying challenge by bar that wished to license only country and western songs from blanket licensing arrangement); see also *BOHANNAN & HOVENKAMP*, *supra* note 4, at 345-47.

reverts to the discredited “leverage” theory, which posits that a firm can obtain additional monopoly profits by tying goods that the purchaser would otherwise not want or that would be available at the competitive price.⁸⁶ Increasingly, antitrust tying law recognizes the objections to leverage doctrine by denying relief to those claiming merely that a tied product is unwanted, without identifying actual foreclosure of rivals.⁸⁷

Further, while identification of a foreclosed rival technology is a necessary condition of competitive harm, it is not a sufficient condition. For example, the inclusion of patent *C* in the previous example would be justified, notwithstanding the availability of a rival’s patent *C'*, if patent *C* in fact blocked some other patent(s) in the licensor’s pool. In that case, the licensee would have to get a license to the *C* patent in any event. Of course, the fact that a blocking patent must be licensed does not entail that it must be practiced. The licensee would still be free in that case to license the *C'* patent separately at whatever fee it can negotiate.

II. EXCLUSION AND REFUSAL TO LICENSE IN HIGH-TECHNOLOGY MARKETS

Under U.S. antitrust law, no firm, not even a monopolist, has a general duty to share inputs or product output with rivals.⁸⁸ The Supreme Court stated this proposition very forcefully in *Verizon Communications Inc. v. Law Offices of Curtis V. Trinko, LLP*,⁸⁹ which leaves very little room for a dealing duty imposed by the antitrust laws.⁹⁰ The Court also recognized one exception two decades earlier in *Aspen Skiing Co. v. Aspen Highlands Skiing Corp.*:⁹¹ once a firm has voluntarily begun a cooperative venture with a rival, it may have a duty not to terminate such a venture without good reason.⁹² The extent to which this duty survives *Trinko* remains to be seen.⁹³ In

⁸⁶ Richard S. Markovits, *Tie-Ins, Reciprocity, and the Leverage Theory Part II: Tie-Ins, Leverage, and the American Antitrust Laws*, 80 YALE L.J. 195, 197-98 (1970).

⁸⁷ See *Brantley v. NBC Universal, Inc.*, 675 F.3d 1192, 1199-1200 (9th Cir. 2012); 9 PHILLIP E. AREEDA & HERBERT HOVENKAMP, ANTITRUST LAW ¶ 1724 (3d ed. 2010).

⁸⁸ *United States v. Colgate & Co.*, 250 U.S. 300, 307 (1919).

⁸⁹ 540 U.S. 398 (2004).

⁹⁰ *Id.* at 410; accord *Pac. Bell Tel. Co. v. Linkline Commc’ns, Inc.*, 555 U.S. 438, 452 (2009). In patents, see *Intergraph Corp. v. Intel Corp.*, 195 F.3d 1346, 1359 (Fed. Cir. 1999).

⁹¹ 472 U.S. 585 (1985).

⁹² *Id.* at 610-11; see also *Trinko*, 540 U.S. at 408-09 (explaining the *Aspen* holding).

⁹³ Cf. Case T-201/04, *Microsoft Corp. v. Comm’n*, 2007 E.C.R. II-3601, ¶ 36, available at <http://curia.europa.eu/juris/document/document.jsf?docid=62940&doclang=EN&mode=&part=1> (finding that Microsoft had an obligation under European Union competition law to share server protocols with rivals because it had previously offered such support voluntarily, but limited it after entering the server market itself).

any event, to say that a monopolist's unilateral refusal to deal with a rival is per se lawful may be an overstatement, but only a modest one.

The same rules largely apply to intellectual property rights. As a general proposition, the owner of a patent or copyright has no duty to license it to a rival or anyone else. Section 271(d) of the Patent Act provides that a refusal to license is not "misuse" or "illegal extension" of a patent.⁹⁴ The latter phrase can be read to suggest that a refusal to license cannot be an antitrust violation either, and in *Illinois Tool Works Inc. v. Independent Ink, Inc.*,⁹⁵ the Supreme Court appeared to read it that way in the context of tying arrangements.⁹⁶ Copyright law does not have a similar provision, but the case law strongly disfavors the use of antitrust law to recognize dealing obligations that the Copyright Act itself does not create.⁹⁷

One difference between refusals to share ordinary productive assets and refusals to share IP rights is that ordinary productive assets can typically be replicated by others. For example, if I own a pipeline or factory and refuse to share it, rivals can generally build their own alternative pipelines or factories and the market will be more competitive. Indeed, one of the reasons we sometimes think of the essential facility doctrine in antitrust as anticompetitive is that it permits rivals to piggyback on the dominant firm's productive assets when the market would actually be more competitive if rivals were given the incentive to develop competing assets on their own.⁹⁸

But intellectual property rights can be different. Most particularly, a patent gives a right to the technology that it covers and makes it unlawful for rivals to duplicate that technology, even if they do so on their own. Indeed, the exclusion is absolute even if rivals make all of the investment in development themselves because they do not know about the dominant

⁹⁴ 35 U.S.C. § 271(d) (2006).

⁹⁵ 547 U.S. 28 (2006).

⁹⁶ *Id.* at 45-46 ("Congress, the antitrust enforcement agencies, and most economists have all reached the conclusion that a patent does not necessarily confer market power upon the patentee. Today, we reach the same conclusion, and therefore hold that, in all cases involving a tying arrangement, the plaintiff must prove that the defendant has market power in the tying product.")

⁹⁷ See, e.g., *Orson, Inc. v. Miramax Film Corp.*, 189 F.3d 377, 385 (3d Cir. 1999) (en banc); *Facebook, Inc. v. Power Ventures, Inc.*, No. C 08-05780 JW, 2010 WL 3291750, at *12-14 (N.D. Cal. July 20, 2010); see also *TV Commc'ns Network, Inc. v. Turner Network Television, Inc.*, 964 F.2d 1022, 1026-27 (10th Cir. 1992) (declining to recognize a cable television network as an "essential facility" as part of a conspiracy to monopolize claim); *Drinkwine v. Federated Publ'ns, Inc.*, 780 F.2d 735, 739-40 (9th Cir. 1985) (copyrighted work not an "essential facility" that must be shared); cf. *Campbell v. Acuff-Rose Music, Inc.*, 510 U.S. 569, 578 n.10 (1994) (suggesting that in some cases the desire to protect creative derivative works may serve to deny a copyright holder injunctive relief); Michael A. Carrier, *Refusals to License Intellectual Property After Trinko*, 55 DEPAUL L. REV. 1191, 1191-92 (2006) (discussing various tests courts have used to analyze monopolists' refusals to license intellectual property).

⁹⁸ See 3B AREEDA & HOVENKAMP, *supra* note 12, ¶ 771b, at 195; see also HERBERT HOVENKAMP, *FEDERAL ANTITRUST POLICY: THE LAW OF COMPETITION AND ITS PRACTICE* § 7.7d2, at 340 (4th ed. 2011).

firm's patents. So if I own a patented process for manufacturing widgets, the consequence of my refusal to share is not simply that rivals are forced to develop the process on their own. They may be disabled from developing the process at all, even if they have no knowledge about how my process works. Patent infringement does not require copying or even subjective knowledge of another's technology, and only a miniscule number of patent infringement suits even find that copying occurred.⁹⁹ Copyright law also prohibits firms from replicating a copyrighted work, although it does require copying.¹⁰⁰

The lack of a copying requirement in patent law can be quite harmful if patents are routinely granted on minor or obvious inventions that would have been produced by numerous rivals under ordinary competitive processes.¹⁰¹ The combination of trivial patents and a no-duty-to-license rule can result in the creation of monopoly in situations that do nothing to incentivize innovation and where competition could otherwise have been expected to emerge.

But patent law goes even further. The rule that a patentee has no duty to license obtains even if the dominant firm is not practicing the patent that the outsider needs.¹⁰² In 1908, the Supreme Court established this principle in *Continental Paper Bag Co. v. Eastern Paper Bag Co.*,¹⁰³ which held that a dominant firm could prevent a rival's use of alternative technology even if (1) the dominant firm was not using the patent that covered this technology, but was using other technology; (2) the dominant firm had acquired the patent in question from another firm precisely for the purpose of denying access to rivals; and (3) the infringement occurred only under a broad claim construction under the patent doctrine of equivalents.¹⁰⁴ In this particular case the infringement defendant's technology was, in fact, quite distinct

⁹⁹ See Christopher A. Cotropia & Mark A. Lemley, *Copying in Patent Law*, 87 N.C. L. REV. 1421, 1422, 1452 (2009) (proof of copying not common in patent infringement cases, except pharmaceuticals); see also Mark A. Lemley, *Should Patent Infringement Require Proof of Copying?*, 105 MICH. L. REV. 1525, 1526 (2007) (stating that patent suits in the information technology industries are not brought as a result of a copied technology); Samson Vermont, *Independent Invention as a Defense to Patent Infringement*, 105 MICH. L. REV. 475, 496 (2006) (stating that many patent suits are brought against independent inventors).

¹⁰⁰ *Feist Publ'ns., Inc. v. Rural Tel. Serv. Co.*, 499 U.S. 340, 361 (1991) (one element of infringement is "copying of constituent elements of the work that are original").

¹⁰¹ See BOHANNAN & HOVENKAMP, *supra* note 4, at 100-05. Identifying truly independent inventors may be difficult, however. See John M. Golden, *Principles for Patent Remedies*, 88 TEX. L. REV. 505, 586-90 (2010); see also Mark P. Gergen, John M. Golden & Henry E. Smith, *The Supreme Court's Accidental Revolution? The Test for Permanent Injunctions*, 112 COLUM. L. REV. 203, 240-41, 247 (2012) (observing how failure to give timely notice or failure to respond to adequate notice once given can affect entitlement to a remedy).

¹⁰² *Cont'l Paper Bag Co. v. E. Paper Bag Co.*, 210 U.S. 405, 429 (1908).

¹⁰³ 210 U.S. 405 (1908).

¹⁰⁴ BOHANNAN & HOVENKAMP, *supra* note 4, at 295-96.

from that described in the unused patent held by the dominant firm, but the Court permitted a very broad claim construction that found infringement.¹⁰⁵

Without undermining the general no-duty-to-share principle, patent and antitrust law could be tweaked a good deal so as to facilitate innovation competition. First is the issue of acquired versus internally developed patents. *Paper Bag* effectively permitted a dominant firm to buy up alternative technologies and shut them down, denying access to rivals even though the acquired patent was not being used by anyone.¹⁰⁶ One might be tempted to say that if the acquired patent really were superior to the dominant firm's technology, then the dominant firm would use it; if it is inferior, little harm is done. But this approach ignores the significance of path dependence and uncertainty in the process of technological development. An incumbent firm may not switch even to a superior technology if the costs of extraction from existing technology are substantial, and in markets that are subject to monopolization this is commonly the case. New firms, by contrast, have no investment commitment. This explains why so many market-shifting innovations come from nondominant firms.¹⁰⁷ Dominant firms have less incentive to shift technologies because they typically have a significant investment in existing technology. Further, monopoly is most likely to occur in markets where the costs of switching technologies are high.¹⁰⁸ All of these factors tend to make alternative technologies more valuable to a monopolist trying to protect its investment than to prospective entrants. In sum, a dominant firm stays ahead of the game *either* by appropriating advancing technology for itself, or else by making sure that no one else gets it. While the former is not of antitrust concern, the latter can be.

The appropriate policy solution in this case is to permit dominant firms to acquire only nonexclusive licenses to patents that function as substitutes or complements to the technology in which the dominant firm has its power. A nonexclusive license gives the dominant firm what it really needs, which is the right to keep its own technology up to date, but not the right to deny access to rivals. To be sure, this rule comes with a price: it makes

¹⁰⁵ For the facts, see *id.* at 295-99.

¹⁰⁶ See *id.* at 295.

¹⁰⁷ For historical examples, see RICHARD R. JOHN, *NETWORK NATION: INVENTING AMERICAN TELECOMMUNICATIONS* (2010); TIM WU, *THE MASTER SWITCH: THE RISE AND FALL OF INFORMATION EMPIRES* (2010).

¹⁰⁸ See Kenneth J. Arrow, *Economic Welfare and the Allocation of Resources for Invention*, in NAT'L BUREAU OF ECON. RESEARCH, *THE RATE AND DIRECTION OF INVENTIVE ACTIVITY: ECONOMIC AND SOCIAL FACTORS* 609, 620-21 (1962). For good analyses of the debate, see Wesley M. Cohen, *Fifty Years of Empirical Studies of Innovative Activity and Performance*, in NAT'L BUREAU OF ECON. RESEARCH, *1 HANDBOOK OF THE ECONOMICS OF INNOVATION* 129, 140-49 (Bronwyn H. Hall & Nathan Rosenberg eds., 2010); Richard Gilbert, *Looking for Mr. Schumpeter: Where Are We in the Competition-Innovation Debate?*, in *6 INNOVATION POLICY AND THE ECONOMY* 159, 159 (Adam B. Jaffe et al. eds., 2006); Jonathan B. Baker, *Beyond Schumpeter vs. Arrow: How Antitrust Fosters Innovation*, 74 *ANTITRUST L.J.* 575, 575-76 (2007).

technology developed by outsiders less valuable in cases where the technology is likely to be sold into a competitive rather than a monopolized market. However, nothing in the Patent Act authorizes the creation or perpetuation of market monopolies.¹⁰⁹

Another approach, which is much less satisfactory, is to follow what many courts have done in the wake of the Supreme Court's decision in *eBay Inc. v. MercExchange, L.L.C.*¹¹⁰ and hold that nonpracticing entities are entitled only to damages rather than an injunction.¹¹¹ The problem is that under current law the remedy might be limited to damages for past infringement, but there is no guarantee that the infringer will be entitled to ongoing production upon payment of a judicially administered license fee.¹¹² Indeed, ongoing infringement may put the infringer in the position of willful infringer yielding enhanced damages.¹¹³

To summarize, a broad rule of no-duty-to-license makes sense in a regime in which patents are strong and nonobvious, clearly communicate their coverage to others, and are actually practiced by their owners. To the extent that the state of patent law is deficient in these areas, however, the no dealing rule can serve both to perpetuate monopoly and to restrain rather than further innovation. In that case, antitrust can fill a gap by limiting the exclusionary power of acquired patents, quite consistently with the language of the Patent Act.

CONCLUSION

Antitrust law was once vulnerable to the charge that it protected smaller competitors at the expense of competition, that it was insufficiently concerned with the welfare of consumers, and that it imposed high social costs by requiring inefficient market structures or distribution processes.¹¹⁴ Then came a twenty-five-year counterrevolution that served to realign the values of antitrust law with those of economic competition generally.¹¹⁵ To be sure, antitrust remains an imperfect enterprise, but it is far more defensible on economic grounds today than it was in the 1970s and earlier. Intellectual property law today is in a position similar to that occupied by antitrust several decades ago.¹¹⁶ The law is far too captured by interest groups that rep-

¹⁰⁹ For development of this proposition, see BOHANNAN & HOVENKAMP, *supra* note 4, at 293-96.

¹¹⁰ 547 U.S. 388 (2006).

¹¹¹ *Id.* at 392-93.

¹¹² See 35 U.S.C. § 271(d) (2006) (stating that a patent owner is not required to license the patent).

¹¹³ See *id.* §§ 284, 285; *In re Seagate Tech., LLC*, 497 F.3d 1360, 1368 (Fed. Cir. 2007) (en banc) (noting possibility of enhanced damages for willful infringement).

¹¹⁴ *E.g.*, ROBERT H. BORK, *THE ANTITRUST PARADOX: A POLICY AT WAR WITH ITSELF* 4, 7 (Free Press 1993) (1978).

¹¹⁵ BOHANNAN & HOVENKAMP, *supra* note 4, at 37-39.

¹¹⁶ See *id.* ch. 3.

resent producers rather than consumers, and that profit from excessive regulation in the name of IP protection.¹¹⁷ While antitrust policy cannot cure defects in the patent and copyright systems—a job that lies exclusively with Congress and with courts interpreting the intellectual property statutes—it can do a great deal to further competition in areas where the IP laws are silent. This is particularly likely to be true with respect to the dissemination, as opposed to the initial creation, of intellectual property rights.

¹¹⁷ *See id.* at 4.