PATENT POOLS: AN ECONOMIC ASSESSMENT OF CURRENT LAW AND POLICY

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I. INTRODUCTION

Patent pools are agreements among patent owners through which patent owners combine their patents, waiving their exclusive rights to the patent so that they or others can obtain rights to license the pooled patents.¹ While many patent pools involve an administrative entity that coordinates the joint licensing of the pooled patents, patent pools may simply involve cross-licensing between two firms.² Patent pools often contain “complementary patents” that cover technologies that must all be practiced to produce a product or achieve some other objective. However, patent pools may also contain “competing patents” that are substitutes.

Economists have explored potential efficiencies that may result from the formation of a patent pool. Building on Cournot’s early study of production processes that employ complementary inputs,³ economists have found that,

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¹. Josh Lerner & Jean Tirole, Efficient Patent Pools, 94 AM. ECON. REV. 691, 691 (2004) (“Patent pools have played an important role in industry since the 1856 sewing machine pool, although their number and importance considerably subsided in a hostile antitrust environment after World War II. Patent pools have been making a comeback in the last few years, and many believe that pools are bound to be as important or more important in the new economy as they were in traditional sectors.”).


³. Economists have long recognized that the cost of manufacturing a product (such as brass) that uses several inputs (such as copper and zinc) in fixed proportions will be higher when each of the inputs is controlled by a separate monopolist than when the same firm controls both complementary inputs or when both inputs are supplied in competitive markets.
when different firms own complementary patents that are all essential to the production of a new product or the use of a new technology, individual patent holders may have both the strategic incentive and ability to “hold up” firms that are trying to develop new products or technologies, deterring innovation. In this type of situation, patent pools are a way of clearing such blocking positions and restoring innovation incentives.

More specifically, if two patent holders need each others’ patents to manufacture new products, and they are the only two companies that are realistically capable of manufacturing these new products, then a cross license can be beneficial since it may promote the sharing of the technologies and the introduction of new products that might otherwise not be produced. Moreover, in this circumstance, a royalty-free cross license will be superior to unilateral licensing since it will facilitate multi-party entry at no increase in marginal costs.

Similarly, if other non-patent-holding firms are capable of manufacturing at least some of the new products, it may be optimal to establish a patent pool that gives these third parties access to the essential patents so that they can enter manufacturing. For example, if a third party is a more efficient manufacturer, but it does not own the essential patents, society may be better off if that third party manufacturer has access to the intellectual property that is essential to the production of the new product. Moreover, access to this technology may be provided at a lower incremental royalty rate through a patent pool that has established rates than would be the case if separate licenses had to be negotiated with each owner of the essential patents. As a result, marginal costs may be reduced by the formation of patent pools,
leading to the production of more output sold at lower prices. Indeed, without patent pools (or cross-licensing), products may not be produced at all and/or there may be a failure to invest in innovative efforts to improve products.9

The fact that patent pools can be efficiency-enhancing is recognized in the law and by policies employed by the antitrust agencies. The Supreme Court has long recognized that the pooling of blocking patents by competitors is “frequently necessary” to practice new technologies. In particular, in *Standard Oil Co. v. United States*, the Supreme Court found that a patent pool that settles conflicting claims (such as conflicts between the patents needed to produce additional gasoline from cracking residual oil) may be procompetitive, stating that “[a]n interchange of patent rights and a division of royalties . . . is frequently necessary if technical advancement is not to be blocked by threatened litigation.”10 In this seminal patent pooling case, the Court also recognized the benefits of having open access to the technology in patent pools, noting that “[i]f the available advantages [of the pooled patents] are open on reasonable terms to all manufacturers . . . such interchange may promote rather than restrain competition.”11

Similarly, the 1995 Federal Trade Commission/Department of Justice *Antitrust Guidelines on the Licensing of Intellectual Property* (“IP Guidelines”) recognize that the pooling of patents can lead to efficiencies “by integrating complementary technologies, reducing transaction costs, clearing blocking positions, and avoiding costly infringement litigation.”12 DOJ business review letters have recognized these efficiencies as well, pointing out that the “combination of complementary intellectual property rights, especially ones that block the application for which they are jointly licensed, can be an efficient and procompetitive method of disseminating those rights to would-be users.”13 These business review letters appear to

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9. *Id.*
10. 283 U.S. 163, 171 (1931); *see also* Broad. Music, Inc. v. CBS, 441 U.S. 1, 20-21 (1979) (making the joint pricing of pooled copyrights legal because of the ability to offer products that would otherwise be unavailable).
reflect the economic literature, which reports that patent pools are “more likely to be welfare-enhancing if patents are more complementary.”

While there are sound, efficiency-based reasons for patent pools, patent pools can also support anticompetitive behavior. A common antitrust concern is the possibility that patent pools will facilitate collusion (either among owners of competing intellectual property or among firms that manufacture products using the patented technology). A second concern is that a patent pool, particularly a patent pool that is associated with the establishment of an industry standard, may foreclose competition relative to an alternative patent pool that allows access to needed patents at lower, less discriminatory royalty rates. For example, a higher patent pool royalty rate that discriminates against non-pool members may be supported by a vertically integrated competitor that is a member of the patent pool to raise rivals’ costs, reducing competition in downstream markets and leading to higher prices in those markets. A third concern is that the owners of patents that are essential to the practicing of a particular standardized technology may use a patent pool to extend their market power by tying the use of non-essential patents that they also own to the licensing of the essential patents, leveraging the firms’ market power into areas that go beyond the rights attributable to the essential patents.

As is true of antitrust policy generally, the antitrust analysis of patent pools has evolved over time with new case precedent, new antitrust agency guidelines, and business review letters. While the relevant agency guidance has remained relatively stable for a decade, recent cases have clarified some open issues, but highlighted that other issues remain unresolved. Three recent cases deserve particular attention: (1) *Rambus Inc.*; (2) *Broadcom*

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Corporation v. Qualcomm Inc.; and (3) U.S. Philips Corporation v. International Trade Commission. Given this recent activity, there is good reason to provide an assessment of current patent pool policy and to identify the economic issues that are likely to be important in the ongoing evolution of this area of the law.

II. SOURCES OF A PATENT POOL’S MARKET POWER

Patent pools sometimes obtain market power by controlling patents that are essential to the practice of a particular technology. Pools may obtain this control over the key patents in several ways. Historically, the focus has been on situations where firms contribute competing patents to the pool or where a patent pool coordinates the licensing of complementary patents that are each essential to the practicing of a new technology. However, more recently, antitrust authorities have paid substantial attention to situations where some of the pooled patents become essential only after an industry standard that relies on these patents is adopted.

A. Pooling of Substitutable Patents

A patent pool can obtain market power by obtaining control over substitutable patents, much like a monopolistic merger between firms that offer competing products. By controlling technologies that are practical substitutes, the pool obtains the ability to increase licensing fees above competitive levels in a manner that would not be possible if there were competition among substitutable patent technologies. Moreover, when there are not close substitutes for downstream products that rely on the pooled technology, the patent pool may also be able to increase the price of manufactured products.

B. Pooling of Complements

A patent pool that only contains complementary patents may also have market power if the pool does not face competition from alternative sources

17. While this is not a “published opinion,” it is available at Civ. No. 05-3350, 2006 WL 2528545 (D.N.J. Aug. 31, 2006).
18. 424 F.3d 1179 (Fed. Cir. 2005), cert. denied, 126 S. Ct. 2899 (2006). While this case was not an antitrust case, it has been cited and discussed in subsequent antitrust cases. See, e.g., Globespanvirata, Inc. v. Texas Instruments, Inc., Civ. No. 03-2854, 2006 WL 543155, at *7-10 (D.N.J. Mar. 3, 2006).
of a substitutable technology. If there is another patent pool that offers a substitutable set of patents or if it is cost-effective for firms to assemble their own set of patents by contacting patent holders individually, the patent pool may not have significant market power. In particular, as the Second Circuit pointed out in *Buffalo Broadcasting Co. v. ASCAP*, “the opportunity to acquire a pool of rights does not restrain trade if an alternative opportunity to acquire individual rights is realistically available.”\(^{19}\) Given this, it is not surprising that many patent pools allow participants to negotiate independent licenses with patent holders outside of the pool as a way of signaling that there are competitive options.\(^{20}\) However, a factual inquiry is required to assess whether the individual rights are “realistically available.”\(^{21}\)

**C. Lock-In Through Standard-Setting**

The establishment of industry standards, which often takes years to complete,\(^{22}\) can give market power to individual patents that was not present before the standard-setting process began. The reason for this is that before a standard is adopted, the industry may have flexibility with respect to the exact technical characteristics of the standard, and thus may be able to adjust the standard so that it avoids relying on certain patents, perhaps by taking advantage of other patents that are substitutable at this early stage. As a result, during the standard development process, patents may be in competition with each other for inclusion in the standard. Patents that face this ex ante competition only become “essential” after a specific standard has

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21. The *Buffalo Broadcasting* court undertook such an inquiry. See 744 F.2d at 925-33.

22. The process of setting an industry standard can take months, if not years, of negotiation among industry participants. As part of this negotiation process, it is common for industry participants to identify patents that must be relied upon to produce products that meet the industry standard. Often there is an effort to set up a patent pool that contains all of the “essential” patents to practice the standard, since this will facilitate production of products that meet the standard. Indeed, as was pointed out above, the efficiencies of patent pools often result from their inclusion of the essential patents that are needed to practice a particular technology.
been adopted and there is a “lock-in” to the standard, as could occur after patent-using firms have invested in manufacturing assets that are designed to meet the particular standard.

Recognizing the market power that is created by post-standard-acceptance lock-in, some commentators have distinguished between the demand for patents that reflects “the inherent technical advantages of the invention” and the incremental demand for the patent that is “created by the adoption of the standard” that utilizes the patent.23 By distinguishing the shift in demand that is due to the standard-setting process from the demand that is due to the inherent characteristics of the patent, some commentators have argued that patent holders are only entitled to the returns associated with the “demand for the invention,” rather than the “demand for the standard.”24 Similarly, the FTC has distinguished between the “inherent value of the patent” and the “market power resulting from the standard.”25

Because inclusion in a standard can give patent holders substantial post-lock-in market power, standard-setting organizations often ask participants in the standard-setting process to reveal the patents that they own or for which they have filed that relate to the standard being developed. They may also ask participants to contribute their patents on a royalty-free basis to the patent pool that supports the standard or to promise to make their patents available on a reasonable and nondiscriminatory (“RAND”) basis.26

While these ex ante promises are designed to eliminate the exploitation of ex post market power, there have been complaints about their effectiveness. Specifically, firms have been accused of failing to reveal that they have patents that are essential to particular standards until after the standard is “locked in.” In addition, firms have been accused of breaking their promise to offer their patents on a RAND basis.

24. Id. This effort may be very difficult in practice because even an essential patent may have little value absent a standard that allows society to use that patent in a productive way.
26. For a discussion of how commitments to RAND royalties may be used to address this issue, see Daniel G. Swanson & William J. Baumol, Reasonable and Nondiscriminatory (RAND) Royalties, Standards Selection, and Control of Market Power, 73 ANTITRUST L.J. 1, 10-45 (2005).
1. Failure to Identify Essential Patents During Pre-Lock-in Period: *Rambus*

The FTC’s *Rambus* complaint involved allegations that Rambus misled a standard-setting organization (“SSO”) by failing to inform it about patents that Rambus held or was working on that were essential to producing products that satisfied the approved standard.\(^{27}\) More specifically, this case stems from the Joint Electron Device Engineering Council’s (“JEDEC”) effort to develop a standard specification for synchronous dynamic random access memory (“SDRAM”) chips, which are a type of semiconductor that is used to store data for brief periods of time.\(^{28}\) While Rambus participated in the development of the SDRAM standard from 1991 to around 1995, it did not reveal its work on relevant patents that issued between 1993 and 2000.\(^{29}\) After the patents issued, Rambus asserted its rights against the SDRAM manufacturers that relied on the standard. The FTC’s complaint argued that the SDRAM standard was developed under the expectation that firms, like Rambus, that participated in the development of the standard would reveal their patents and that Rambus’s failure to disclose its patents and subsequent attempt to exercise its patent rights was an antitrust violation.\(^{30}\)

In analyzing this case, the FTC found that standard-setting “can be highly beneficial to consumers. . . . But when a firm engages in exclusionary conduct that subverts the standard-setting process and leads to the acquisition of monopoly power, the procompetitive benefits of standard-setting cannot be fully realized.”\(^{31}\) In particular, the FTC recognized that disclosure “helps avoid the possibility of hold-up by enabling SSO participants to seek protection from excessive royalties ‘ex ante’—i.e., before choosing which technologies to incorporate into the standard”—when there are options (and thus the patented technology has a lower value).\(^{32}\)

\(^{27}\) See Opinion of the Commission, Rambus Inc., F.T.C. Docket No. 9302, at 12-13 (Aug. 2, 2006), available at http://www.ftc.gov/os/adpro/d9302/060802commissionopinion.pdf. An earlier FTC Order involved a similar allegation against Dell Computer Corporation. See Dell Computer Corp., 121 F.T.C. 616, 617-18, 624-25 (1996). In this matter, the FTC alleged that Dell threatened to enforce previously undisclosed patent rights against computer companies that adopted the VL-bus standard, which is a standard that underlay the transfer of data instructions between a 486 chip computer’s CPU and its peripherals. Id. at 617-18.


\(^{29}\) See id. at 3.

\(^{30}\) Id. at 3, 4-5.

\(^{31}\) Id. at 3.

\(^{32}\) Id. at 35.
Much of the debate in this case focused on what JEDEC required in the way of disclosures. However, the FTC also commented that even “[i]f an SSO chooses not to require such disclosures, SSO members still are not free to lie or to make affirmatively misleading representations.”\textsuperscript{33} Given this, current antitrust policy, at least at the FTC, appears to require participants in standard-setting organizations to be careful about revealing their patent rights.

2. Post-Lock-in Pricing: Broadcom

As pointed out above, patents that face competition from substitutable patents before a patent pool is formed (and the technology becomes standardized) may no longer face significant competition after a patent pool is formed and the associated technology becomes a well-accepted industry standard. Because lock-in is a significant issue, many standard-setting organizations often require participants in the standard-setting process to agree to license all patents essential to compliance with a standard at fair, “reasonable and non-discriminatory terms.”\textsuperscript{34} Courts have also required that pooled patents be licensed at a reasonable royalty.\textsuperscript{35}

While firms may commit to charging a RAND royalty, there is reason to be concerned about the meaningfulness of this commitment because, as Daniel G. Swanson and William J. Baumol point out, “[i]t is widely acknowledged that, in fact, there are no generally agreed tests to determine whether a particular license does or does not satisfy a RAND commitment.”\textsuperscript{36}

The possibility that a firm that has committed to charge RAND licensing fees may violate antitrust law by charging fees that are above RAND levels is raised in \textit{Broadcom Corp. v. Qualcomm Inc.}\textsuperscript{37} This case involved the

\textsuperscript{33} Id.


\textsuperscript{35} See, e.g., Hartford-Empire Co. v. United States, 323 U.S. 386, 406-07 (1945) (concluding that a patent pool between glass manufacturers violated the antitrust law). The Court mandated the licensing of the pooled patents at reasonable royalties. \textit{Id.} at 413-14.


technology and chipsets that operate cell phones employing third generation Wideband Code Division Multiple Access (“WCDMA”) technology that was implemented through the Universal Mobile Telephone System (“UMTS”) standard. The plaintiff (Broadcom) alleged (among other things) that Qualcomm violated the antitrust laws by inducing a standard-setting organization to adopt a standard that relies on Qualcomm patents by promising fair, reasonable and nondiscriminatory (“FRAND”) licenses and by subsequently refusing to live up to this commitment.

The district court found against Broadcom, arguing that “Qualcomm’s ‘power’ to control the licensing of its patents is derived from the rights it enjoys as a patent-holder. The adoption of an industry standard neither diminishes nor augments this exclusionary right.” The court appears to have concluded that there was no effect on competition in the marketplace because the adoption of the standard was what eliminated the competition, rather than any action taken by Qualcomm. However, this argument ignores the fact that “but for” the promise to charge FRAND royalties, a different standard that relied on different patents might have been adopted by the industry. It also ignores the possibility that a higher royalty charge may be part of a strategy by a vertically integrated competitor to raise rivals’ costs, reducing competition in downstream markets and leading to higher prices in those markets. Put slightly differently, the Broadcom decision ignores the ex ante competition in a technology market that led Qualcomm to commit to charging FRAND royalties, which would allow rivals to compete in the future. As a result, allowing Qualcomm to renege on this competitive licensing fee not only injures competitors that have to pay a higher royalty, but may injure competition. One explanation for the court’s reluctance to find for the plaintiff is that this would have required the court to grapple with the difficult economic issue of determining what the appropriate FRAND royalty should be, which is an area that the court did not want to get into.

38. Id.
39. Id. at *2-3.
40. Id. at *9; see also Townshend v. Rockwell Int’l Corp., Civ. No. 99-0400, 2000 WL 433505, at *12 (N.D. Cal. Mar. 28, 2000) (“The adoption of a industry standard . . . does not confer any power to exclude that exceeds the exclusionary power to which a patent holder is entitled.”). The Broadcom court also argued that the relevant “technology market . . . is devoid of competition by virtue of a standard.” 2006 WL 2528545, at *9.
42. “This [c]ourt shares the Supreme Court’s concern that reviewing and supervising the terms upon which Qualcomm licenses its patents, and offers to sell its UMTS chipsets may be beyond the effective control of the Court under the antitrust laws.” Id.; see Verizon Commc’ns Inc. v. Law Offices of Curtis V. Trinko, LLP, 540 U.S. 398, 415-16 (2004) (noting that the
Another explanation is that the court may have felt that the royalties that were charged did not diverge too much from FRAND levels.43

Government agencies have recognized the importance of pre-lock-in commitments to RAND royalties. For example, the DVD-6C and MPEG-2 Business Review Letters required that the pools grant licenses on a nondiscriminatory basis with the same terms and conditions to all would-be licensees.44 With respect to the DVD-6C pool, the DOJ reviewed the proposed royalty and concluded that it was “small relative to the total costs of manufacture” and thus unlikely to disadvantage rivals.45

III. POTENTIAL ANTICOMPETITIVE EFFECTS: REDUCTION IN COMPETITION AMONG POOL MEMBERS

Although patent pools are often procompetitive, there are also a number of ways that they can reduce competition. Patent pools can involve agreements that reduce competition directly or by altering the incentives of the pool members. The direct effects are fairly straightforward. First, a patent pool may involve agreements between firms that offer competing patents to refrain from competing in the license of their technologies. By jointly setting a monopolistic royalty rate or agreeing not to license their competing patents to others, the patent holders can limit competition that would have arisen in technology markets but for the collusive agreement. Second, the pool may restrain competition between firms that compete in downstream product markets. In particular, patent pools may provide a context in which competing manufacturers may reach and enforce a collusive agreement. Third, the patent pool may involve monopsonistic agreements among potential licensees to depress the price that is charged for the pooled intellectual property. In addition to these agreements that will directly affect

Sherman Act “does not give judges carte blanche to insist that a monopolist alter its way of doing business whenever some other approach might yield greater competition”).

43. The court commented that plaintiff’s complaint “does not provide information on the composition or dynamics of the market for UMTS chipsets to enable the Court to infer that Qualcomm’s conduct is anticompetitive.” Broadcom, 2006 WL 2528545, at *10. This suggests that the plaintiff may not have shown that the higher royalty rates that Qualcomm was seeking were so much above the FRAND level that they would prevent rivals, such as the plaintiff, from competing successfully. The court also highlights the fact that others have licensed Qualcomm’s license without complaint. Id.


prices, a patent pool may involve ancillary agreements that affect firm incentives to compete.

A. Agreements Among Competing Patent Holders to Raise License Fees

The concern that patent pools may support collusion among owners of substitutable patents is reflected in the early case law. For example, in *Hartford-Empire Co.*, the Supreme Court found that a patent pool that combined patents used in the production of glassware had violated antitrust law by reducing competition between different glassware technologies through restrictions on the types of glassware products that could be manufactured and, in some cases, through limitations on the amount that could be produced.46

These concerns are still present in antitrust law, as reflected in the IP Guidelines, modern consent decrees, and business review letters.

- *IP Guidelines*: “Cross-licensing and pooling arrangements can have anticompetitive effects in certain circumstances. For example, collective price or output restraints in pooling arrangements, such as the joint marketing of pooled intellectual property rights with collective price setting . . . may be deemed unlawful if they do not contribute to an efficiency-enhancing integration of economic activity among the participants.”47

- *Agency Decrees*: The FTC negotiated a consent decree that was premised on the allegation that the formation of a patent pool had stopped competition between two firms. Specifically, Summit and VISX had competing claims to the exclusive rights to technology for photorefractive keratectomy (“PRK”) vision correcting eye surgery that was the subject of litigation.48 They settled the litigation by forming a patent pool in which the parties shared the revenues derived from licensing fees to the combined technology. The FTC alleged that, but for the patent pool, the parties “could have and would have competed with one another in the sale or lease of PRK equipment by using their

respective patents, licensing them, or both." This matter was settled by consent agreements that required royalty free cross-licensing to support competition between the two firms.

- **Business Review Letters**: The DOJ’s MPEG-2 Business Review Letter gives significant weight to the fact that the MPEG-2 patent pool would only include essential patents and that an independent expert was responsible for evaluating the essentiality of particular patents and thus was a gate keeper for determining which patents would be included in the pool and which ones would be excluded as non-essential. This approach reflects the economics literature that has emphasized that patent pools are less likely to be anticompetitive if they only include complementary patents.

## B. Agreements Among Pool Members that Affect Downstream Product Prices

Patent pools may not only eliminate competition between substitutable patents, but they may be used by manufacturers of products that rely on these patents to conspire in downstream markets by allocating customers and fixing prices. Courts have recognized this for some time. In the seminal case on patent pools, *Standard Oil Co. v. United States*, the Supreme Court (while finding the patent pool that was at issue in the case to be procompetitive) recognized that patent pools could eliminate downstream competition. Subsequently, in *Hartford-Empire Co. v. United States*, the Supreme Court applied the standards that it set out in *Standard Oil*, finding that there was an illegal conspiracy to allocate customers. Numerous other cases have

49. Id.


52. See, e.g., Shapiro, *Navigating the Patent Thicket*, supra note 3, at 123, 127 (emphasizing the desirability of package licensing complementary patents, but not substitutable patents).


54. 323 U.S. 386, 406-07 (1945). In this case, which involved a patent pool that pooled more than 600 patents relating to glass manufacturing machinery, the members of the pool were accused of allocating different glass products among themselves and preventing pool
followed. For example, in United States v. New Wrinkle, Inc., the parties formed a patent pool that was found to be per se illegal because it allocated markets and fixed prices.\(^55\) Similarly, in United States v. Line Material Co., the Supreme Court looked at minimum price restrictions that were included in pooled patents, concluding that the formation of the pool involved illegal fixing of prices.\(^56\) In reaching this conclusion, the Court pointed out that “[w]here two or more patentees with competitive, non-infringing patents combine them and fix prices on all devices produced under any of the patents, competition is impeded to a greater degree than where a single patentee fixes prices for his licensees.”\(^57\)

Given this strong case precedent, it is not surprising that antitrust concern about downstream price fixing among patent pool members continues today. For example, the IP Guidelines cite New Wrinkle for the proposition that “pooling arrangements are mechanisms to accomplish naked price fixing or market division . . . subject to challenge under the per se rule.”\(^58\)

C. Collusion Among Licensees that Depresses Licensing Fees

While much of the concern about collusive behavior among members of patent pools has focused on the ability of patent holders to collusively raise the prices they charge for patent licenses or downstream products that rely on the pooled patents, there is also the possibility that the patent pool is used by potential patent licensees to coordinate their licensing of patents, “collusively reducing the price paid for intellectual property.”\(^59\) The threat of monopsonistic collusion has been recognized by the courts. For example, in Sony Electronics, Inc. v. Soundview Technologies, Inc., which involved a request to dismiss a § 1 claim against a boycott by potential licensees, a collusive effort to exercise monopsony power was recognized as being a violation of the antitrust laws.\(^60\)

\(^{56}\) 333 U.S. 287, 311 (1948).
\(^{57}\) Id. One analyst has indicated that the Supreme Court’s finding may be flawed because the patents at issue were not competitive, since there is some evidence that one patent blocked the other. See Andewelt, supra note 2, at 637.
\(^{58}\) IP GUIDELINES, supra note 12, § 5.5, at 28.
\(^{59}\) Swanson & Baumol, supra note 26, at 13.
As is true in other contexts, whether joint efforts by potential licensees to set license fees would be addressed under the per se or rule of reason standard depends on the extent to which the joint efforts are rooted in integration, risk-sharing, or other efficiencies. While some have concluded that “the integration and efficiencies needed to justify outright collective bargaining on royalties are in short supply,” recent statements by DOJ and FTC representatives suggest that there is a recognition that such discussions may be justified by a variety of considerations, such as the threat that post-lock-in market power will be exploited.

D. Ancillary Agreements that Reduce Incentives to Compete

The antitrust agencies pointed out in the IP Guidelines that there is the possibility that pooling agreements that require pool members to grant licenses to each other for current and future technology may undermine incentives to innovate. While this may involve an explicit conspiratorial agreement to slow the development of a new technology, it may also occur when one pool member can free ride on other pool members’ future innovative efforts. For example, some types of royalty-free licenses on future technological developments may have this adverse effect since improvements on the patented/licensed technology have to be licensed to others at no charge, allowing these others to “free ride” on the innovative effort and reducing incentives to innovate.

While cases that clarify the theory outlined in the IP Guidelines are not available, there are consent agreements that settled cases that involved these theories. Two are cited in support of the IP Guidelines’ concern that pooling arrangements may deter or discourage participants from engaging in research and development. However, the strength of the cases underlying these

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64. See IP GUIDELINES, supra note 12, § 5.5, at 29.

settlements is unclear. In particular, a private case that followed the theory outlined in one of these settlements, *United States v. Automobile Manufacturers Ass’n*, was dismissed because of a failure to show an unreasonable restraint of trade.  

IV. POTENTIAL ANTICOMPETITIVE EFFECTS: FORECLOSURE OF COMPETITION

As indicated above, a patent pool that contains patents that are “essential” to the production of a product can have substantial market power. Courts have been concerned that this market power may be used to foreclose downstream competition, either by denying competing manufacturers access to needed technology or by raising rivals’ costs.

Courts have been concerned that patent pools may be controlled by downstream competitors that have an incentive to restrict entry into these downstream markets.  

For example, in *United States v. Besser Manufacturing Co.*, the district court found an antitrust violation where “the patentees have joined hands with the . . . largest competitors in the industry and by terms of their agreement have virtually made it impossible for others to obtain rights under those patents.” Similarly, in *United States v. Krasnov*, the court condemned an exclusive patent pool in which the participants possessed market power.

While courts have tended to allow individual patent holders to decide whether or not to issue a license to their patents, courts have been suspicious of patent pools that do not license their patents to all comers, including situations where the parties contributing patents to the pool have veto power over who receives future licenses. In fact, some courts have

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67. “[T]he Supreme Court has condemned arrangements under which the dominant firm or firms in an industry have pooled patents from a number of inventors and then denied rivals access to the technology.” 12 PHILLIP E. AREEDA & HERBERT HOVENKAMP, ANTITRUST LAW: AN ANALYSIS OF ANTITRUST PRINCIPLES AND THEIR APPLICATION ¶ 2043b2 (2d ed. 2000).
70. *See, e.g.*, *In re Indep. Serv. Orgs. Antitrust Litig.*, 203 F.3d 1322, 1328 (Fed. Cir. 2000). *But see* Image Technical Servs., Inc. v. Eastman Kodak Co., 125 F.3d 1195, 1226-27 (9th Cir. 1997) (modifying an injunction to require Kodak to sell or license its parts to ISOs, buying cooperatives, or any interested parties, on reasonable and nondiscriminatory terms).
considered it per se unlawful to give veto rights to firms that contribute patents to the pool.\(^72\)

The *IP Guidelines* reveal a concern that control over a patent pool may foreclose competitors. Specifically, the Guidelines indicate that patent pools can be anticompetitive if “excluded firms cannot effectively compete in the relevant market for the good incorporating the licensed technologies and . . . the pool participants collectively possess market power in the relevant market.”\(^73\) The pools will be condemned if “the arrangement’s limitations on participation are [not] reasonably related to the efficient development and exploitation of the pooled technologies.”\(^74\)

When considering whether competitors have access to essential pooled patents, courts and the antitrust agencies do not simply look at whether patent pools refuse to offer licenses to the patents; they also look at whether the rates charged for the offered licenses are low enough to make licensing a realistic option. If the royalties do not appear to be excessive and if licensees are competing successfully, courts have typically found no problem with the pool.\(^75\)

V. POTENTIAL ANTICOMPETITIVE EFFECTS: FORECLOSURE OF RIVAL TECHNOLOGIES BY TYING ESSENTIAL AND NON-ESSENTIAL PATENTS

A. Tying: Background

Patent pools typically allow downstream manufacturers to license a bundle of patents. Because licensees buy a bundle of patents, some parties have attempted to characterize patent pools as tying arrangements in which the purchase of one patent is “tied” to the purchase of other patents. This type of tying theory was advanced recently in *U.S. Philips Corp. v. International Trade Commission.*\(^76\) In particular, the plaintiff alleged that the patent pool that Philips ran involved an illegal tie between patents that were “essential” to implementing a standard, and “nonessential” patents.

\(^72\). *See, e.g.*, Mason City Tent & Awning Co. v. Clapper, 144 F. Supp. 754, 767 (W.D. Mo. 1956).

\(^73\). *IP Guidelines*, *supra* note 12, § 5.5, at 28.

\(^74\). *Id.* § 5.5, at 28-29.


Economists have recognized that tying may have both procompetitive and anticompetitive effects. Procompetitive effects result because of efficiencies associated with the joint purchase of products. 77 In fact, in the context of a patent pool, the procompetitive effects of tying are likely to result from the efficiencies that economists have associated with the formation of patent pools. 78 Anticompetitive effects are likely to relate to the foreclosure of competitors and the leveraging of the firm’s market power in the “tying product market” into the “tied product market.” 79 In the case of patent pools, as is explained more fully below, it has been alleged that firms use their control over essential patents to force the purchase of nonessential patents, foreclosing rival technologies, which advantages the tied patents in the pool relative to substitutable patents that are excluded from the pool.

B. U.S. Philips Corp. v. International Trade Commission

Philips was a patent misuse case 80 that involved claims that a patent pool used illegal tying. 81 Specifically, the plaintiffs alleged the anticompetitive

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77. Economists have recognized that bundling or tying may be associated with the following types of efficiencies: (1) Improved performance and product reputation (e.g., when products are used together it can be important to make sure that all of the products are of a high quality); (2) reduced manufacturing and/or distribution costs (e.g., when products are manufactured or sold together, joint production and/or distribution can lower costs); (3) reduced customer costs or increased convenience (e.g., when products are used together, customers may find it less costly to purchase them together); (4) reduced litigation costs (e.g., when products that are used together are purchased from a single supplier, it is easier to assign legal responsibility should the products fail to perform as promised); (5) new product introduction (e.g., it may only be profitable to introduce a new product if the firm can earn the profits on the entire bundle of products).

78. See Part I for a discussion of these efficiencies.

79. There are also non-leveraging theories. However, these do not appear to apply to patent pools. These non-leveraging theories include: (1) the use of tying to control substitution of the tied product for the tying product; (2) the use of tying to facilitate price discrimination; (3) the use of tying to make entry more difficult; (4) the use of tying to evade regulatory constraints; and (5) the use of tying to facilitate collusion.

80. Patent misuse is an equitable defense to a patent infringement claim. There are three common alleged types of patent misuse:

(1) Extension of Monopoly Doctrine: extension of patent beyond rights guaranteed by the patent grant;

(2) Walker Process: patent was obtained through “knowing and willful fraud” on the Patent and Trademark Office;

(3) Sham Litigation: lawsuit that is brought to enforce patent is objectively baseless (e.g., the patent holder knew that its patent was invalid when it filed the lawsuit against another party).
tying of a number of patents that were required to practice recordable and rewritable compact disc ("CD") technology with other patents that were alleged to be nonessential. 82

In this case, an administrative law judge and the United States International Trade Commission ("ITC") found that Philips (which licensed patents for a pool that included patents owned by Philips, Sony, Ricoh, and Taiyo Yuden) had tied essential CD patents to nonessential CD patents. 83 Moreover, the ITC found that the package licensing agreements adversely affected competition in the market for nonessential technology. 84

The case was appealed to the Federal Circuit. The Federal Circuit disagreed with the ITC, concluding that there was not a per se or rule of reason violation for the following reasons:

Not a per se violation because: (1) the matter involved "patent-to-patent" tying, which unlike "patent-to-product" or "block-booking" tying, does not require customers to use the licensed patents to the exclusion of other patents and thus does not necessarily have a foreclosing effect; 85 (2) there was no evidence that the allegedly nonessential patents were in fact

Patent misuse law and antitrust law are closely connected. In fact, the Supreme Court recently recognized this connection. See III. Tool Works Inc. v. Indep. Ink, Inc., 126 S. Ct. 1281, 1289 (2006) ("The presumption that a patent confers market power migrated from patent law to antitrust law in International Salt Co. v. United States." (citation omitted)). The Court found this to be important because "[i]n 1988, Congress . . . amend[ed] the Patent Act to eliminate the market power presumption in patent misuse cases." Id. at 1284; see Act of Nov. 19, 1988, Pub. L. No. 100-703, § 201, 102 Stat. 4674, 4676 (codified at 35 U.S.C. § 271(d)(5) (2000)) (entitling a patent owner to relief for infringement even when the owner conditions the license of patent rights on the acquisition of a license to rights in another patent “unless, in view of the circumstances, the patent owner has market power in the relevant market for the patent or patented product on which the license or sale is conditioned”). The Court indicated that “[w]hile the 1988 amendment does not expressly refer to the antitrust laws, it certainly invites a reappraisal of the per se rule announced in International Salt.” Ill. Tool Works, 126 S. Ct. at 1290-91. As noted above, Philips has been cited in recent antitrust cases involving similar patent tying issues. See supra note 18.

81. This case involved patent misuse law’s extension of monopoly doctrine. Under this doctrine, it is illegal to use “patent leverage” to extend a monopoly to get a benefit not attributable to the patent’s teachings. See, e.g., Zenith Radio Corp. v. Hazeltine Research, Inc., 395 U.S. 100, 136 (1969).

82. While the discussion here will focus on the allegation that Philips engaged in mandatory and coercive package licensing, the case also alleged that Philips required grant back licenses and engaged in predatory patent litigation.


84. Id. at 1144.

85. Id. at 1187-89.
nonessential, since there was no evidence that customers would have preferred licensing substitute patents to the allegedly “nonessential” patents and because some of the alternative technologies were still being developed at the time the patent bundle was assembled and thus were not available;\(^86\) (3) there was no evidence that the price for the bundled patents was higher than it would have been if it had excluded the allegedly nonessential patents;\(^87\) and (4) there was an efficiency-based rationale for offering the bundle.\(^88\)

Not a rule of reason violation because there were no significant anticompetitive effects to offset the procompetitive benefits of the bundling that the court identified, despite a finding that Philips had market power.\(^89\)

The Federal Circuit’s findings suggest that patent pools that include some nonessential patents will not be analyzed under a per se standard\(^90\) and are unlikely to be found to be involved in illegal tying, especially when a single fee is charged for the bundle and there is no reason to believe that a lower fee would have been charged if the nonessential patents were excluded from the patent pool. However, this should not be taken to signal that other ties will necessarily receive such a strong endorsement.

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86. Id. at 1190.
87. Indeed, the court suggested that it would have been legal to charge the same royalty for the essential patents and to give the nonessential patents away for free. Id. at 1190-91.
88. The Federal Circuit pointed to the following as examples of the efficiencies it had in mind: (1) a reduction of transaction costs; (2) a reduction of potential patent disputes and associated legal costs; and (3) the ability to price the package of patents needed to practice the technology so that the customer was assured that the price of practicing the technology was clear and aligned with the benefits of that technology, rather than employing a more complicated pricing mechanism that required the determination of the marginal benefit of individual patents that have little or no independent value because other patents were also essential to practicing the technology. Id. at 1192-93.
89. Id. at 1198.
90. A recent district court decision concurs with this view, stating:

For the reasons provided in Philips, the Court finds that Defendants’ alleged tying arrangement does not constitute a per se violation of the Sherman Act. Tying a patent that is necessary for complying with a standard with related but nonessential patents does not constitute “a naked restraint of trade with no purpose except stifling of competition” that “always or almost always tend to restrict competition and decrease output . . . .”

VI. ONGOING POLICY ISSUES

The law and economics of patent pools make it clear that patent pools often provide an efficient institutional solution to problems that arise when firms have complementary intellectual property rights that are essential to the practicing of new technologies. While the coordination of patent licensing activities that is provided by patent pools often contributes to economic growth, the law and economics of patent pools makes it clear that there can be significant antitrust risks when actual or potential competitors coordinate the licensing of their intellectual property. In particular, patent pools can lead to inefficient outcomes when they are used by competitors to allocate markets or otherwise chill competition.

While there is much “black letter law” that clearly identifies the types of agreements that patent pools cannot implement without violating antitrust law, there is firm conduct that is difficult to analyze. Not surprisingly, the more complicated cases arise when patent pools involve a mix of procompetitive and anticompetitive attributes. Among the more difficult to analyze situations that antitrust practitioners may encounter are:

- **Pre-lock-in pricing discussions**: On the one hand, joint discussions about licensing fees among firms with potentially substitutable patents raise the specter that the patent pool will facilitate collusion and higher licensing fees. On the other hand, given the shift in relative negotiating positions that occurs once a patent is locked into a standard, industry members have a procompetitive incentive to negotiate RAND royalty agreements before standards are finalized and a patent is locked into the standard.

- **The exclusion of nonessential patents from patent pools**: On the one hand, the exclusion of nonessential patents from a patent pool will reduce the chance that the pool is being used to support collusion among owners of competing (substitutable) technologies, since the substitutable technologies are left to compete with each other outside of the patent pool. On the other hand, a joint decision to exclude patents from a patent pool may be viewed by some as a “boycott” of the excluded technology.

- **The inclusion of nonessential patents in patent pools**: On the one hand, the inclusion of nonessential patents in a patent pool may be viewed as an effort to leverage market power associated with
essential patents to advantage particular nonessential patents. In addition, as was mentioned above, the inclusion of nonessential patents in a patent pool raises the issue of whether the patent pool is supporting collusion among competing patents. On the other hand, efficiencies may result from the pooling of all the patents that are needed to practice a standard in a single pool. Moreover, the decision of what patents are essential may be unclear and may even evolve over time.

- **The revelation of proprietary information:** On the one hand, firm incentives to invest in the research and development needed to develop new technologies can be enhanced by allowing firms to keep their ongoing efforts confidential. On the other hand, allowing firms to hide the existence of relevant patents or patent filings may slow the development of new standards and the associated social benefits because firms proceed more cautiously when developing standards due to the fear that they will be ambushed by hidden patents.

A. Pricing Discussions

Patent pools (and standard-setting organizations that may facilitate or set up patent pools) have been concerned that discussions about pricing of intellectual property may be viewed as anticompetitive. As a result, they have often restricted discussions about royalties because there is a concern that such discussions will invite an antitrust challenge.91 For example, the Institute of Electrical and Electronics Engineers, Inc., provides the following guidance:

*So what can you discuss about patents at a standards-development meeting?*

You can cover the content of the patent letter of assurance form, you can discuss the technical merits of using the technology under patent, and you can discuss the way patent information is made available from the IEEE. You must not discuss subjects like the pricing for use of a patent, how a patent should be licensed, validity or interpretation of a patent claim, or any

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91. Peterson, supra note 34, at 9.
terms or conditions of use. These are not appropriate topics for discussion in a standards developing committee.92

Others have similar rules against discussions that attempt to define RAND prices in the standard-setting process.93

As FTC Chairman Majoras recently pointed out in a speech that urged a more lenient attitude toward ex ante royalty discussions:

While the antitrust concerns are understandable, they may have unduly prevented announcements of pricing intentions or royalty discussions that may, in fact, provide procompetitive benefits. First, a patent holder’s voluntary and unilateral disclosure of its maximum royalty rate, like most unilateral conduct, is highly unlikely to require antitrust scrutiny. Unilateral announcement of a price is, by definition, not a collective act subject to per se condemnation or even review under Section 1 of the Sherman Act, and it is hard to see how announcing one’s price before sale (without more) could amount to exclusionary conduct under Section 2.

Second, joint ex ante royalty discussions that are reasonably necessary to avoid hold up do not warrant per se condemnation. Rather, they merit the balancing undertaken in a rule of reason review. We would apply the rule of reason to joint ex ante royalty discussions because, quite simply, they can be a sensible way of preventing hold up, which can itself be anticompetitive. Put another way, transparency on price can increase competition among rival technologies striving for incorporation into the standard at issue.94

Chairman Majoras’s view parallels that expressed by R. Hewitt Pate, the DOJ’s Assistant Attorney General in the Antitrust Division, who commented that “[t]here is a possibility of anticompetitive effects from ex ante license

93. For example, the American National Standards Institute (“ANSI”) guidelines state: “It should be reiterated . . . that the determination of specific license terms and conditions, and the evaluation of whether such license terms and conditions are reasonable and demonstrably free of unfair discrimination, are not matters that are properly the subject of discussion or debate at a [standards] development meeting.” AM. NAT’L STANDARDS INST., GUIDELINES FOR IMPLEMENTATION OF THE ANSI PATENT POLICY: AN AID TO MORE EFFICIENT AND EFFECTIVE STANDARDS DEVELOPMENT IN FIELDS THAT MAY INVOLVE PATENTED TECHNOLOGY § III.B (1997), available at http://www.niso.org/committees/OpenURL/PATPOL.pdf.
94. Majoras, supra note 63, at 7 (footnote omitted).
fee negotiations, but it seems only reasonable to balance that concern against the inefficiencies of ex post negotiations and licensing hold up.95

The views expressed by the heads of the two antitrust agencies are reflected elsewhere. Courts have also outlined some circumstances where such discussions can take place.96 More recently, the FTC commented that “under certain circumstances, members of an SSO may even collectively negotiate these types of ex ante licenses, without necessarily running afoul of the antitrust laws.”97 In addition, academics have argued that early pricing discussions may have the procompetitive benefit of avoiding higher prices that would be set after specific patents are locked into an industry standard.98

As was pointed out above, one approach that is used to protect against post-lock-in price increases, while also minimizing antitrust risks that may arise if there are detailed ex ante pricing discussions between competitors, is to require patent pool participants to commit to charging RAND royalties at the time they contribute their patents to the patent pool. While this approach is sometimes used,99 it does not provide the price protection that may be obtained from more specific pre-lock-in commitments, since there may be disputes over the “reasonableness” and “nondiscriminatory” nature of royalties. One standard-setting organization, the VMEbus International Trade Association (“VITA”), recently tried to address this problem by approaching the DOJ to obtain a business review letter that would approve VITA’s policy that “requires that patent holders make early disclosures of patents and patent applications that may be essential to implementing VITA standards once they are adopted” and “requires that patent holders declare the maximum royalty rate and most restrictive non-price licensing terms they will require from those who must take a patent license in order to implement the eventual

95. Pate, supra note 36, at 9.
96. Earlier courts have indicated that such discussions about prices are most likely to avoid antitrust problems when they are open ex ante discussions, rather than secret ex post discussions. See, e.g., Sony Elecs., Inc. v. Soundview Techs., Inc., 157 F. Supp. 2d 180, 188 (D. Conn. 2001).
98. See, e.g., Patterson, supra note 23, at 1046.
99. See Peterson, supra note 34, at 6-7. RAND licenses may include terms besides the royalty rate. These ancillary terms must be reasonable as well. The term “RANDz” has been employed to capture situations when firms that contribute patents to a pool receive no compensation and where the licenses include other ancillary reasonable and nondiscriminatory terms.
VITA standard.” DOI’s press release that announced that VITA would be allowed to proceed as planned expressed the view that VITA’s licensing policy “‘should preserve, not restrict, competition among patent holders’” because it enables the organization “to choose between technologies based not only on technical terms, but also licensing terms.”

Efforts that encourage firms to make more than promises to charge RAND royalties appear to make sense since there can be significant disputes over whether specific royalties are “reasonable” and “nondiscriminatory.”

1. Reasonableness Requirement

When assessing the reasonableness of a royalty, one approach would be to evaluate the following hypothetical: If the firms that own existing

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101. Id. (quoting U.S. Assistant Attorney General Thomas O. Barnett).
102. Recently, some have argued that proposals that encourage some form of ex ante disclosure of prices “would likely cause more difficulties and unintended consequences than they could correct—even assuming the solution could be implemented in practice.” Damien Geradin & Anne Layne-Farrar, The Logic and Limits of Ex Ante Competition in a Standard-Setting Environment, 3 COMPETITION POL’Y INT’L 79, 106 (2007). This view appears to be based on the following propositions: (1) auctions may not be possible if there are not competing patents; (2) joint negotiations appear far too dangerous because they may cause more harm than good (perhaps due to downstream price fixing that results); and (3) the existing FRAND and voluntary ex ante licensing processes work relatively well. However, revelation of prices to potential purchasers in advance of purchase is at the heart of free-market economies, since knowing the purchase price is a key part of informed purchasing and efficient resource allocation. As a result, advocating that commitments to particular technologies be made without knowledge of purchase prices (as is implicitly being done when ex ante pricing discussions are not permitted) is contrary to the type of economic decision making that underlies free-market economics. Moreover, it is far from clear that one needs competing patents to set a price for a particular firm’s intellectual property, since firms that own monopoly patent rights can still identify the price that they will charge for their unique intellectual property, which will allow participants in the standard setting process to know in advance of any lock-in what prices will be paid and thus to make informed decisions as to whether it is worth proceeding. Finally, concerns about potential antitrust violations associated with ex ante pricing negotiations appear to be overstated, especially when one recognizes that prices for this (or similar) intellectual property must be set at some point and that price negotiations could be closely monitored by private antitrust counsel and the disparate members of the standard setting organization. As a result, given the obvious economic problems associated with post-standard lock-in of particular intellectual property, it is likely that ex ante pricing will be helpful in at least some contexts.
patents\textsuperscript{103} are competing, what rate would they charge for a license to their patents during the “ex ante” period before the patent pool (and any associated standard) is established?\textsuperscript{104} This hypothetical makes it clear that the appropriate time for valuing a patent is the “ex ante” period before it is locked in to a standardized technology. It also makes clear that royalty rates that are set collusively during this period are not reasonable.

The most direct way to implement this reasonableness standard is to hold ex ante auctions in which patent holders would submit competitive bids that indicate what they would charge for licenses to their patents if they were included in the patent pool that underlies a standard.\textsuperscript{105} As a result, if post-lock-in royalties align with pre-lock-in commitments that are approved by a standard-setting organization that actively involved unintegrated downstream customers who did not complain about the proposed royalties at the time they were approved by the standard-setting organization, plaintiffs are likely to have some difficulty in convincing courts that post-lock-in rates are not RAND rates.\textsuperscript{106}

Unfortunately, the organization of competitive auctions or other negotiations that lead patent holders to provide detailed RAND commitments that satisfy unintegrated customers are not always possible. In particular, because standard-setting organizations often are cooperative efforts, it is often difficult to weigh the differences in bid prices when there are also differences in the characteristics of substitutable technologies and different downstream customers have different preferences as to the characteristics of the pooled technology/standard. As a result, it is likely that courts will have to use less direct evidence when assessing the reasonableness of some royalties.

\textsuperscript{103} “Existing patents” should be defined to include both patents that have been approved and patents that are likely to be approved in the foreseeable future, and thus impose a competitive constraint on pricing of other patents.

\textsuperscript{104} This type of standard is implicit in the famous Georgia-Pacific factors for evaluating the reasonableness of royalties. These include looking at “[t]he amount that a licensor . . . and a licensee . . . would have agreed upon . . . if both had been reasonably and voluntarily trying to reach an agreement.” Georgia-Pacific Corp. v. U.S. Plywood Corp., 318 F. Supp. 1116, 1120 (S.D.N.Y. 1970), modified, 446 F.2d 295 (2d Cir. 1971). More specific discussions of auctions can be found in the academic literature. See, e.g., CARL SHAPIRO & HAL R. VARIAN, INFORMATION RULES: A STRATEGIC GUIDE TO THE NETWORK ECONOMY (1999); Swanson & Baumol, supra note 26, at 15-21.

\textsuperscript{105} See Swanson & Baumol, supra note 26, at 15-21.

\textsuperscript{106} In Townshend v. Rockwell International Corp., Civ. No. 99-0400, 2000 WL 433505, at *7, 11 (N.D. Cal. Mar. 28, 2000), the court relied on the fact that the IP holder was willing to license the plaintiff under terms and conditions that were submitted to the standard-setting organization before the standard was established.
Even when there has not been an auction, the consideration of what would have happened if there had been an auction (a “hypothetical auction approach”) provides some guidance as to the ranges in which RAND royalty rates are likely to lie. First, royalty rates that are produced by competitive auctions need not be the same for all patents in the pool. For example, patents that face competition are likely to receive lower royalty rates than patents for which there are no substitutes. Second, when a patent faces competition, it is likely that the firm would bid aggressively, perhaps offering access to its patent for close to its marginal costs. However, the exact price will depend on market characteristics such as the number of competitors and the substitutability of the technologies that they offer. Third, while a patent that does not face competition from potential substitutes may be licensed at a higher price, the price will be capped by a number of considerations, including competitive pressures that limit downstream price increases (e.g., substitution of other products or processes that don’t rely on the pooled patents for the product or process that relies on the pooled patents). Along these lines, some case law has found, for example, that a reasonable royalty cannot exceed the amount, “which a person desiring to manufacture and sell a patented article, as a business proposition, would be willing to pay as a royalty and yet be able to make and sell the patented article, in the market, at a reasonable profit.” In particular, if the royalty costs are low relative to other marginal production costs, it is likely that the royalty can be defended as a RAND royalty. However, when undertaking

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107. As Swanson & Baumol point out, marginal costs may not be zero since patent holders may face “a plethora of ongoing incremental costs.” Swanson & Baumol, supra note 26, at 22. These include negotiation costs, contracting costs, accounting costs, monitoring costs, auditing costs, training costs, technical support costs, and upgrading costs. Id.

108. When applying this analytical approach, the objective of economic efficiency would suggest that the profitability analysis be based on a “person” that is at least as efficient as the patent holder, assuming that the patent holder is vertically integrated into downstream production, because it does not make sense to reduce the royalty to allow an inefficient downstream manufacturer to make a profit at the expense of the patent holder.


110. For example, in its 1999 Business Review Letter that analyzed the DVD-6C pool, the DOJ based its decision to allow the pool to proceed in part on the conclusion that the agreed royalty was “small relative to the total costs of manufacture.” DVD-6C Business Review Letter, supra note 15, at 14. This type of analysis is complicated in dynamic markets since the “total costs of manufacture” can change over time, causing a royalty that is a small percentage of manufacturing costs at one point in time to become a much larger percentage at a later point in time.
this comparison of royalty costs to other marginal production costs, one must take into account learning that will reduce manufacturing costs over time, since this may affect the reasonableness of the royalty.

A variety of market-based factors may be useful in determining whether a particular royalty is reasonable. The well-known Georgia-Pacific factors that courts have embraced when determining reasonable royalties include indicia such as the royalties paid for similar technology,\textsuperscript{111} the revenues that are likely to be generated using the patents to produce downstream products,\textsuperscript{112} and the term of the license.\textsuperscript{113} However, the Georgia-Pacific factors can be viewed as rules of thumb that provide general guidance. Detailed analysis of the options open to the parties involved in the negotiation, and historical market transactions, are often required to provide concrete estimates.

Some have argued that standard-setting organizations that require participants to commit to charging RAND royalties may discourage firms with relevant intellectual property from participating in the standard-setting activities because it may reduce their potential royalty revenues.\textsuperscript{114} However, as others have pointed out, this depends on how RAND royalties are measured. If RAND royalties include sufficient payments to the licensor so that they can cover any direct incremental costs associated with the licensing of the intellectual property and the intellectual property owner’s ex ante incremental opportunity cost of licensing to others, then participation in the standard-setting effort is unlikely to be discouraged.\textsuperscript{115} While firms may adopt a strategy to remain outside of the standard-setting discussions in the hope that they will be able to charge royalty rates that reflect post-lock-in strategic advantages, public knowledge about patents and the possibility that the standard will be written in a way that does not rely on the firms’ intellectual property work against this strategy.

\begin{footnotes}
\item[111.] Georgia-Pacific Corp. v. U.S. Plywood Corp., 318 F. Supp. 1116, 1120 (S.D.N.Y. 1970), \textit{modified}, 446 F.2d 295 (2d Cir. 1971). Georgia-Pacific focuses on the rates received by the patent holder and paid by the potential licensee for the use of comparable patents, rather than third-party transactions. \textit{Id.} However, economists have suggested that looking at these third-party transactions may provide relevant information. \textit{See generally} Atanu Saha & Roy Weinstein, \textit{Beyond Georgia-Pacific: The Use of Industry Norms as a Starting Point for Calculating Reasonable Royalties}, http://www.micronomics.com/articles/intellectualproperty\_x.pdf.
\item[112.] \textit{Georgia-Pacific}, 318 F. Supp. at 1120.
\item[113.] \textit{Id.}
\item[115.] \textit{See} Swanson & Baumol, \textit{supra} note 26, at 47.
\end{footnotes}
2. Nondiscriminatory Requirement

The “nondiscriminatory” requirement of RAND pricing is meant to assure that the licensor does not charge materially different fees to similarly situated parties. Since RAND pricing allows different prices to be charged to parties that are in different situations, it is likely that there will be future cases that debate whether two parties are “similarly situated.” In particular, because some pools allow firms that contributed patents to the pool to receive royalty-free licenses to the pool even if others outside the pool must pay a royalty, it is probable that future cases will consider whether this type of arrangement involves discrimination.

Royalty-free cross licensing to pool members when others are charged for using the pooled technology raises some economic issues. In particular, this royalty structure may imply that the royalty rate that is paid by vertically integrated competitors that contributed patents to a patent pool is much lower than the rate paid by downstream competitors that did not contribute patents to the patent pool. This difference in incremental costs can have significant consequences for downstream competition because the higher costs can undermine the ability of competitors to compete in downstream markets.

B. Determination of Scope of Patent Pool

The decision as to what patents to include in a patent pool can be a difficult one. While DOJ business review letters suggest that antitrust authorities are less likely to be concerned that adverse horizontal effects will result from a patent pool if the pool only includes “essential patents,” the policy of limiting patent pools to essential patents is not without its costs. In particular, it may be that patent pools that require licensees to negotiate separately for complementary patents that are only “nonessential” because there are substitutable patents will find that the adoption of the associated technology is slower than it would otherwise be. One reason that this might be the case is that parties that would want to use the pooled technology may encounter higher costs than would have been the case if the patent pool had included at least one of the complementary “nonessential” patents in the

116. A secondary consideration is the possibility that royalty-free cross licensing can lead to inefficiencies because firms are imposing no charge for using property that may have incremental costs. Id. at 41-42.
117. The fact that asymmetrical royalties can affect competition in downstream markets has been recognized by others. See, e.g., id. at 28.
118. See supra note 15 and sources cited therein.
pool. For example, it may be that the pool could negotiate a deal that included the complementary, but not “essential,” patent in the pool at a royalty rate that was very low by threatening to turn to rival patent holders. Because the pool may be in a particularly good negotiating position relative to a firm that represents less potential licensing revenue, it may be able to negotiate a lower royalty. Moreover, negotiating a one-time contract with the patent pool eliminates the need for each pool customer to also negotiate separate agreements with suppliers of the complementary patents that were only determined to be nonessential because there were substitutes.\footnote{In its MPEG-2 Business Review Letter, the DOJ noted that the original licensing agreement allowed participants in the pool to grant licenses outside of the pool. MPEG-2 Business Review Letter, supra note 13, at 4. It was argued that this structure helped undermine collusion between firms that offer competing, nonessential patents since licensees theoretically could offer holders of “essential patents” slightly more than their share of the patent pool earnings and then play owners of competing patents off against each other to avoid a payment that is equal to slightly less than the share that goes to competitive patents. \textit{See id.} at 14. However, there is some doubt as to whether such a negotiating strategy would work, given the transaction costs and oligopolistic behavior that is likely to be encountered. Moreover, if some of the patents are controlled by downstream competitors, it is even less likely that they will support a strategy that lowers the costs of competitors.}

In a dynamic world, there is another problem with focusing on whether a patent pool contains only essential patents. It may be that patents that were essential at the time the patent pool was set up are no longer essential. Given this, a policy that focuses on whether patents in the pool are “essential” is a time sensitive analysis.

Allowing nonessential, complementary patents to be included in a patent pool may not be problematical for another reason. The firms that own the essential patents, which are the core patents in the patent pool, are unlikely to be willing to share the rents associated with these patents with firms that provide complementary, but nonessential, patents unless there are efficiency reasons for including these patents in the pool.\footnote{As was mentioned earlier, one possible concern is that the pool might be exercising monopsony power. \textit{See supra} Part III.C.} Put somewhat differently, if a patent pool is being constructed that has essential patents, the firms that own the blocking patents have a financial incentive to limit the patent pool to only essential patents if the inclusion of nonessential patents reduces the licensing profits that flow to the owners of the essential patents. However, if there are efficiencies associated with including these nonessential, complementary patents, the owners of the essential patents will have an incentive to include them in the pool.
The court’s decision in Philips appears to move antitrust policy in this direction. While the Philips decision was in part based on the view that the plaintiff did not demonstrate that any of the pooled patents were not essential patents, the court also made it clear that there could be significant efficiencies from pooling essential patents with other complementary patents. Moreover, it pointed out that there was unlikely to be an antitrust issue if the price that was paid for the pooled patents was no larger than one would have paid for the essential patents. This suggests that as long as the inclusion of nonessential patents in the pool has a minimal effect on the pool’s royalty charge, courts are unlikely to be troubled by an assertion that there is a tie between the essential patents and the nonessential patents (especially since customers can still buy rivals’ nonessential patents and use them along with the pooled patents, suggesting that there is unlikely to be foreclosure of rival technologies because of the inclusion of the nonessential patents in the pool).

While courts have clearly indicated that the decision to include nonessential patents in a patent pool should be analyzed under a rule of reason analysis and have suggested that they may look favorably on such pools, this does not mean that there is no economic basis for being concerned about the inclusion of nonessential patents in a pool. As was indicated above, the inclusion of a group of substitutable nonessential patents may facilitate collusion among the owners of these patents. In addition, it may be that the inclusion of one nonessential patent rather than another may give the owner of the included patent a strategic advantage over its competitors. As Swanson and Baumol point out:

Selection as a proprietary standard may affect relative beliefs about quality, leaving at least some (and perhaps many) market participants to view alternative technologies as less close substitutes for the designated technology. . . .

Selection also can affect market expectations about future commercial success . . . .

Finally, selection . . . can reduce ex post competitiveness in the relevant technology market because licensees (or prospective licensees) incur durable

121. See supra note 88 and accompanying text.
investments tailored to the selected standard that give rise to non-negligible switching costs.\textsuperscript{122}

Given these advantages, a careful rule of reason analysis is required to determine whether there are significant anticompetitive effects associated with the inclusion of nonessential patents in a patent pool.

C. Revelation of Relevant Patents

Given the FTC’s expressed concern about hidden patents,\textsuperscript{123} firms are on notice that the failure to reveal that they hold relevant patents when they are participating in standard-setting discussions may expose them to antitrust risks. However, the extent of these antitrust risks is still being worked out.

The Federal Circuit, when confronted by vague disclosure requirements, indicated that “[w]hen direct competitors participate in an open standards committee, their work necessitates a written patent policy with clear guidance on the committee’s intellectual property position. [The policy must define] what, when, how, and to whom the members must disclose . . . .”\textsuperscript{124} Standard-setting organizations appear to be aware of the importance of requiring participants to reveal their ownership of relevant patents.\textsuperscript{125} However, the approaches that are taken differ with respect to the “scope of knowledge triggering the disclosure” (e.g., participant’s personal knowledge versus search); the nature of information that is disclosed (e.g., disclose issued patents versus pending patent applications); and the point in time when disclosures are made (e.g., early in the process or shortly before balloting).\textsuperscript{126}

\textsuperscript{122} Swanson & Baumol, \textit{supra} note 26, at 8-9. For others who make some of these same points, see generally SHAPIRO & VARIAN, \textit{supra} note 104, at 103-71; Stanley M. Besen & Joseph Farrell, \textit{Choosing How to Compete: Strategies and Tactics in Standardization}, 8 J. Econ. Persp. 117 (1994).


\textsuperscript{124} Rambus Inc. v. Infineon Techs. AG, 318 F.3d 1081, 1102 (Fed. Cir.), \textit{cert. denied}, 540 U.S. 874 (2003).

\textsuperscript{125} Lemley, \textit{supra} note 34, at 1904-05, 1957.

\textsuperscript{126} Peterson, \textit{supra} note 34, at 6.
Because the courts and agencies have not provided clear guidance as to what level of disclosure is sufficient to satisfy antitrust law, there is a basis for concern that the delayed revelation of relevant patents may raise antitrust issues. This poses a problem for standard-setting efforts, especially during the early stages of the standard-setting process when the technology that underlies the standard is still in flux and when the participants in the process are likely to be engineers who may have limited knowledge about the firm’s patent portfolio.

While there would appear to be a strong social efficiency basis for requiring early disclosure—since it will facilitate the development of a low-cost standard—there are other considerations. In particular, when the revelation of information about a firm’s efforts to develop new technologies provides competitors with information that can seriously reduce the profits from undertaking research and development efforts, policies that require the revelation of information may chill the formation of the patent pool, R&D efforts, or both. Similarly, some economists have expressed concern about the extension of these disclosure requirements to include unpatented trade secrets, since this is costly to the parties that must reveal these secrets and may chill future investment by reducing the returns from such investment.127

Given the practical difficulties associated with providing very early revelation of all relevant patents and the reluctance of courts to require firms to reveal proprietary information, it is unlikely that courts will require firms to reveal all relevant patents during the earliest stages of the standard-making process. However, as the technical underpinnings of a standard become clearer and firms have become more involved in the process, it is probable that firms have more responsibility to identify relevant patents.

Future case law is likely to focus on providing guidance for defining the obligations that firms have to reveal information. At the present, cases like Rambus have involved the extreme situation where a firm is alleged to have been aware that it controls technology that is essential to the standard and failed to reveal this fact despite an alleged obligation to do so. While the FTC is concerned about this extreme situation, it is unclear that courts will fully embrace the FTC’s position. It is also unclear how far beyond this position the antitrust agencies and courts might go. While it is possible that antitrust law might require firms to undertake an affirmative firm-wide search for all relevant patents at an early stage in the standard-setting process and to reveal the results of this search, this appears unlikely. Given the institutional realities of the standard-setting process, courts may be reluctant

127. Swanson & Baumol, supra note 26, at 52.
to impose such a burden on participants during the earliest stages of the standard-making process unless a standard-setting organization has adopted a clear policy that requires such an effort.