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PATENT EXPLOITATION AND MODERN ANTITRUST LAW: A SPECIAL CASE FOR MERGER ANALYSIS

Barry E. Adler*

INTRODUCTION

The licensing of patents and the marketing of patented products run afoul, at times, of the antitrust laws. Exploitation of a patent has characteristics similar to the exploitation of monopoly power. The courts have established a rather odd set of rules to limit patent exploitation. The United States Supreme Court, in particular, has applied various, sometimes contradictory, rationales in its rulings. Part I of this article describes some of the Supreme Court case law in this area and offers an alternative economic analysis of patent exploitation. It concludes that the Court, in general, has treated the marketing of patented products and processes too harshly, and, as a result, has lost sight of the purposes of antitrust law in this area.

In 1979, the Supreme Court held in Broadcast Music, Inc. v. CBS,1 that the marketing of blanket licenses for the performance of copyrighted music was not a violation of the antitrust laws. Part II of this article describes how Broadcast Music, though not a patent case, should alter the way the antitrust laws limit patent exploitation. The Court’s rationale in Broadcast Music requires courts to take a hard look at a patentee’s conduct before allowing the antitrust laws to bite. A patentee’s marketing activities, although analogous to monopolistic exploitation, are important production-enhancing elements in the fragile process of creating intellectual property; a process that Congress has specifically sanctioned. Building on the current Justice Department Merger Guidelines, Part III proposes a framework for this “hard look.”

I. PATENTS UNDER THE ANTITRUST LAWS

A. Background

A patent is a property interest in information. Our founding fathers recognized the need for such an interest when they vested in Congress the

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The author thanks Frank Easterbrook and William Landes for their help.

power "to promote the Progress of Science and useful Arts, by securing for limited Times to Authors and Inventors the exclusive Right to their respective Writings and Discoveries."\(^2\) Congress has exercised this power by providing that "whoever invents or discovers any new and useful process, machine, manufacture, or composition of matter, or any new and useful improvement thereof, may obtain a patent therefor . . . ."\(^3\) A patent grants "to the patentee, his heirs or assigns, for the term of seventeen years . . . the right to exclude others from making, using or selling the invention . . . ."\(^4\)

Patents are necessary to provide incentives to inventors. Innovation is expensive. Moreover, many creative endeavors end without positive result. No one knows with any degree of certainty that a desired invention can actually be created; nor does one know for sure that an invention will be useful even if one succeeds in creating it. Thus, few will pursue innovation absent the knowledge that a useful invention will provide rewards for the inventor.

Patent laws provide such rewards. The legal system gives an inventor enforceable exclusive rights to a new invention. Innovation is as easy to copy as it is difficult to create. If there were no legal constraints, an inventor's ideas could be exploited with no resulting benefit to the inventor. Merely copying another's idea normally requires no great expenditure of physical or mental resources. Analogous is a magician's illusion. One is baffled until the trick is explained; then the solution appears obvious. One who copies an inventor's idea can compete against the inventor for the invention's rewards.

Legal protection solves this free rider problem; exclusive rights to a useful invention are valuable. Assume, for example, that an inventor discovers a patentable method to manufacture television sets for half the existing cost of production. The inventor may enter the television manufacturing market and undersell the competition, or the inventor may license the patent to an existing manufacturer. The manufacturer will be able to increase its profits if this license is exclusive. Thus, if the inventor can restrict use of the invention, the manufacturer will be willing to pay the inventor for the inventor's rights. It is this ability to market an exclusive right that gives the inventor additional incentive to invent.

Thus far we have seen why Congress enacted patent protection. There are, however, still unanswered questions. Why is patent protection limited to seventeen years? How can patents run afoul of the antitrust laws? The answers to these questions are related. Briefly, patents create something analogous to monopoly power. There is an economic rent to the exclusive

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2. U.S. Const. art. 1., § 8, cl. 8.
interest in intellectual property. That is, a patentee or the patentee's licensee can charge more for the last unit of the product than that unit cost to produce. Presumably, patents are limited to seventeen years because Congress has found that time period sufficient to provide incentives to innovate. A shorter period might result in too little innovation. On the other hand, any longer period might create an undesirable loss to the economy because a patent holder would continue to charge more than marginal cost for products, thus inefficiently inflating price and reducing quantity sold. This inefficiency, called dead weight loss, is also the target of antitrust law. Thus, many actions by a patentee to exploit a patent are subject to antitrust scrutiny.

Before a discussion of the antitrust laws that regulate patent use, consider the source and the nature of a patentee's rent, and the accompanying dead weight loss. Rents devolve upon a patentee either because the patentee holds the rights to a unique product or because the patentee holds the rights to a unique cost-saving device used in the manufacture of an existing product. Assume the patentee has invented a unique product; for example, an automobile engine that will run one hundred miles per gallon of gas. The relevant economic data for that engine may be as described by Illustration 1:

$\begin{align*}
\text{Illustration 1}^{5} \\
D \text{ is the demand curve for the engines; } MC \text{ is the marginal cost of producing the engines; } MR \text{ is the marginal revenue to the patentee or licensee in selling the engines. These symbols will be used throughout this article.}
\end{align*}$
The patentee, or the patentee's licensee, will sell $Q_1$ engines at a price of $P_1$. At this combination the patentee will earn an economic profit of an amount illustrated by rectangle I. Given the existence of the invention, the optimal price and quantity for society as a whole are $P_o$, $Q_o$. Only at this combination is society expending resources equivalent to the maximum value those resources could produce. The shaded triangle represents society's dead weight loss—the value of the engines that the manufacturer optimally would have produced, but did not.\(^6\)

If the patentee loses exclusive rights to the engine design, the market will eliminate dead weight loss. Assuming that anyone may use the design at no cost, $Q_o$ engines will sell at $P_o$. If the patentee attempts to sell engines at above $P_o$, which equals marginal cost, other manufacturers with presumably similar production capacities will step in and offer the engines for $P_o$, undercutting the patentee's price. Thus, the marginal cost curve defines the price of $P_o$, and it is in the patentee's or anyone's interest to provide engines at that price until the market reaches equilibrium at $Q_o$.

Now assume that a patentee has invented a unique cost-saving device used in the manufacture of an existing product. Perhaps the patentee has designed a method by which conventional piston engines can be produced at half the existing cost of production. Before the innovation, the relevant economic criteria for engines might be as described by Illustration 2:

\[ \text{Illustration 2} \]

The market would clear at $P_o$, $Q_o$.

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\(^6\) This analysis assumes that the patentee or licensee cannot price discriminate. See infra text accompanying notes 32 & 33.
Enter the cost-saving device:

$ 1

\[ P_0 \] - MC (no innovation)

\[ P_1 \] - 

\[ P_2 \] - MC (innovation)

Illustration 37

The market would clear at \( P', Q' \).

Price has decreased and quantity has increased as compared to a world with no patented innovation. There is, of course, a net economic gain to society, as compared with the preexisting situation. The patentee, however, will earn an economic profit illustrated by rectangle I. The patent laws thus create the setting for dead weight loss. The shaded triangle represents society's lost opportunity to use resources to their maximum potential. For the same reasons discussed above regarding Illustration 1, price and quantity would move to \( P_2, Q_2 \), but for the exclusive right to the patented invention.

It is clear, however, that the dead weight loss described in these illustrations is not necessarily inefficient or anti-competitive. The economic rents and corresponding "loss" in each case exist only given the existence of the innovation in question. As we have seen, the innovation exists because the inventor foresaw some return on investment in the act of inventing. The prospect of economic rents, sometimes mislabeled "monopoly profits,"

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7. MR is the marginal revenue curve that a single market monopolist would face. Because the demand curve for the patentee or his licensee is coincident with MC (no innovation) until it crosses and follows the industry demand curve, the patentee's or licensee's marginal revenue curve is coincident with MC (no innovation) until it crosses the industry demand curve, is there
is the very incentive that produces the invention. Without the economic rents in Illustration 1, there would be no dead weight loss, but neither would there be a new efficient engine. Similarly, absent economic rents in Illustration 3, there would be no dead weight loss, but neither would there be a new efficient method of production. The dead weight loss then becomes a cost to society only when the exclusive use granted to the patentee provides incentives in excess of what is necessary to encourage investment in any given innovation. The expected profits, if sufficient to compensate an inventor for the effort of inventing, encourage innovation. And, as we have seen, once an innovation exists, society better uses its resources. Unrestrained by a patentee’s exclusive rights, society would put these resources to even better use. Thus, if a patentee can, unencumbered, extend or expand a patent’s power, rewards not justified by efficiency considerations may accrue to the patentee.

In principle the antitrust laws operate to prevent the unencumbered expansion of a patentee’s power. Section 1 of the Sherman Act provides that “every contract, combination in the form of trust or otherwise, or conspiracy, in restraint of trade or commerce . . . is declared to be illegal.” Section 2 of that Act provides that “every person who shall monopolize, or attempt to monopolize, or combine or conspire with any other person or persons, to monopolize any part of . . . trade or commerce . . . shall be deemed guilty of a felony . . . .” Thus, if a patentee either enters into contracts with others in order to exploit the patent—i.e., a patentee licenses the discontinuous and, in circumstances not here illustrated, could result in a market that clears at the same price and quantity that would obtain without the innovation. For the sake of simplicity, however, MR is assumed to be the marginal revenue curve for the patentee or his licensee. P₁ and Q₁ are the price and quantity respectively at which the patentee or his licensee will sell. The two MC curves represent the marginal cost for the patentee or his licensee, and the marginal cost for industry as a whole, absent the innovation.

8. The process alluded to in the text is far more complex than meets the eye. Dead weight loss, discussed in the text, and the loss most frequently discussed in literature, is not the only possible loss from excessive patent protection. See, e.g., Baxter, Legal Restrictions on Exploitation of the Patent Monopoly, 76 Yale L.J. 267 (1966): [M]onopoly over [an] invention decreases the incentives of innovators other than the initial patentee to engage in further research within the field covered by the monopoly. For any improvement discovered will be subservient to the initial patent and useless in the hands of anyone but the initial patent holder; and in dealing with the initial patent holder the subsequent inventor will occupy a weak bargaining position since he faces a monopsonistic buyer. The extent of the dampening effect increases as the legal life of the initial monopoly is made longer.

Id. at 270. Nor are dead weight loss and dampening of future innovation the only costs of patent protection, “but reference to them is sufficient to make the point that [a patent, analogous to a] monopoly device . . . . is capable of diverting too many resources to innovation and that the question of how much monopoly subsidy to confer is a difficult one.” Id. at 271. See also Kaplow, The Patent Antitrust Intersection: A Reappraisal, 97 Harv. L. Rev. 1815, 1816-45 (1984). An analysis of this issue is beyond the scope of this article. Suffice it to say that the optimal patent protection cannot be precisely measured.


11. Id. § 2.
exclusive rights in a new engine to an engine manufacturer—or attempts to use an invention to "corner the market," his activities may be subject to antitrust scrutiny. Exploiting a patent, either unilaterally or with others, is thus analogous to the exploitation of monopoly power.\textsuperscript{12}

Of course, patent protection and its benefits would vanish if every attempt to exploit a patent were considered an antitrust violation. The law does not go this far.\textsuperscript{13} We now turn to the rather odd set of rules established by judicial decisions in the area of patent exploitation.

\textbf{B. Case Analysis}

It is useful, at this point, to examine a few of the Supreme Court's decisions that illustrate the treatment of patent licensing arrangements under the antitrust laws.

\textit{1. Exploiting a Patent to Its Limits; In General}

\textit{Brulotte v. Thys Co.},\textsuperscript{14} though not an antitrust case, is a good starting point. A patent licensing agreement provided royalties for the use of machines beyond the expiration of the last patent for components incorporated in the machines. The Supreme Court held that the royalty provision was unlawful.

A patent empowers the owner to exact royalties as high as he can negotiate with the leverage of that monopoly.

But to use that leverage to protect those royalty payments beyond the life of the patent is... an effort to enlarge the monopoly of the patent... The exaction of royalties for use of a machine after the patent has expired is an assertion of monopoly power in the post expiration period when... the patent has entered the public domain.\textsuperscript{15}

\textit{Brulotte} has carried over into formal antitrust analysis. In \textit{Zenith Radio Corp. v. Hazeltine Research, Inc.},\textsuperscript{16} licensee Zenith brought a Sherman Act claim against patentee Hazeltine, alleging that Hazeltine had unlawfully attempted to extend its patents by insisting on acceptance of its package license agreement and by reserving royalties on the licensee's total sales, regardless of whether Zenith actually used the licensed patents in the products manufactured. Relying on \textit{Brulotte}, the Court held that a patentee

\textsuperscript{12} In addition to the Sherman Act provisions cited in the text, § 3 of the Clayton Act, 15 U.S.C. § 14 (1982), \textit{inter alia}, explicitly prohibits a patentee from tying the licensing of his patent to the licensee's agreement not to deal with the patentee's competitors. Such activity is considered an illegitimate extension of a patent. For a more detailed discussion of tie-ins, see infra notes 24-33 and accompanying text.

\textsuperscript{13} The Supreme Court has broadly defined a patentee's right exclusively to exploit his patent, a right that includes the ability to enter into exclusive licensing arrangements. \textit{See} Dawson Chemical Co. v. Rohm & Haas Co., 448 U.S. 176 (1980). In \textit{Dawson}, the Court, relying on § 271(c) and § 271(d) of the Patent Act of 1952, upheld the right of the holder of a patented method of applying an herbicidal to refuse to license its process to a competing manufacturer of the herbicide used in the process. \textit{Dawson}, however, is not an antitrust case.

\textsuperscript{14} 379 U.S. 29 (1964).

\textsuperscript{15} \textit{Id.} at 33.

\textsuperscript{16} 395 U.S. 100 (1969).
may not "use the power of his patent to insist on total sales royalty and to
override protestations of the licensee that some of his products are unsuited
to the patent or that for some lines of his merchandise he has no need or
desire to purchase the privileges of the patent."17

In both Brulotte and Zenith, the Court was concerned that, absent restraint,
a patentee would extort from a licensee a profit in excess of the profit
Congress granted in extending patent protection. These cases reflect the
concern that excess patentee power will cause a licensee to make purchases
that, but for coercion, the licensee would not make, thus creating a misal-
location of resources beyond that necessary to provide incentives for inno-
vation. This concern was misplaced. The Court in Brulotte accepted that "a
patent empowers the owner to exact royalties as high as he can negotiate
with the leverage of that monopoly."18 What the Court failed to realize in
both Brulotte and Zenith is that the patentee in each case could do no more
than exploit the patent law's seventeen-year exclusive rights. A purchaser
will not pay more for something than its worth. This is true whether the
purchase is of a security, an automobile or a license. Payments spread out
over time, or based on a percentage of license sales, can, therefore, best
be explained by legitimate creative financing arrangements, not by mono-
poly profit extraction.

To illustrate, let us use a hypothetical that includes all the seemingly
objectionable features in Brulotte and Zenith. Assume that an engine manu-
ufacturer wishes to license the rights to a design for a gas-saving automobile
engine. Assume also that the patentee will license the design only if the
manufacturer will pay a flat-rate royalty on every automobile that the
manufacturer sells for the next twenty-five years, whether or not the man-
ufacturer uses the patentee's engine. Moreover, to create an extreme example,
assume that the patentee includes in the royalty a charge for the rights to a
printing process, the use of which the manufacturer values not at all. Will
the manufacturer purchase this package that includes the rights to the
valuable gas-saving engine? The answer, of course, depends in large part on
the price of the package. The manufacturer would estimate the increase in
sales and profits from cars over the next twenty-five years attributable to
the license and would use this estimate to calculate the present value of the
license. Taking the total number of cars to be sold times amount of the
entire royalty and discounting to present value provides the present cost of
the license. In comparing present value to present costs, if the costs exceeded
the benefit, the manufacturer would reject the deal.

It is hard to see, therefore, how a patentee could extract from a licensee
more than the patent's value. The patentee will attempt fully to exploit the
patent by finding the most efficient licensees—those valuing most, and thus
most willing to pay for, the license. The patentee will also attempt to extract
from licensees the full value of the patent to the licensees. There are any

17. Id. at 139.
18. 379 U.S. at 33.
number of ways a patentee may accomplish this, but none of these will allow the patentee to earn more for a patent than the patent is worth. No rational actor will pay something for nothing, nor will one pay twice for the same thing. Thus, at least according to the Court’s stated rationale, Brulotte and Zenith were wrongly decided.19

Other cases, however, do implicitly recognize the inherent power of the marketplace to limit a patentee’s power. In Aronson v. Quick Point Pencil Co.,20 the parties entered into a contract in which Aronson, in return for a royalty of five percent of the selling price, granted Quick Point the exclusive right to make and sell a keyholder designed by Aronson for which a patent application was pending. If the patent was not allowed within five years, the royalty was to be reduced to two and one-half percent of sales. The patent was disallowed, and Quick Point tried to escape its contractual obligation to pay Aronson two and one-half percent on the unpatented item. The Court upheld the contract and noted that the parties themselves were best able to determine the prospective value of a pending patent application:

No doubt a pending patent application gives the applicant some additional bargaining power for purposes of negotiating a royalty agreement. The pending application allows the inventor to hold out the hope of an exclusive right to exploit the idea, as well as the threat that the other party will be prevented from using the idea for 17 years. However, the amount of leverage arising from a patent application depends on how likely the parties consider it to be that a valid patent will issue.21

Similarly, Automatic Radio Manufacturing Co. v. Hazeltine Research, Inc.,22 allowed an arrangement by which a licensee paid a flat per unit royalty for a license whether or not the units of output included a patented input. In that case, Automatic Radio acquired a license to use all Hazeltine patents by promising to pay a percentage royalty based on the selling price of Automatic’s radio receivers. Hazeltine sued for the royalty payments. Automatic alleged patent misuse since the agreement extracted royalties whether or not any of the patents were used in Automatic’s radio receivers. The Court upheld the agreement as a convenient method designed by the parties to avoid determining whether each radio receiver embodied a Hazeltine patent. The percentage royalty was an acceptable alternative to a lump sum payment for the privilege to use the patents.23 The Court was not concerned that Hazeltine might extort from Automatic payments beyond the value of the patents that Automatic actually used.

It seems obvious that the rationale of Automatic Radio and Aronson

21. Id. at 265.
23. Id. at 834. The Court also invoked licensee estoppel, a rule that “the licensee under a patent license agreement may not challenge the validity of the licensed patent in a suit for royalties due under the contract.” Id. at 836 (citation omitted). That this is no longer the general rule was stated by the Court in Lear, Inc. v. Adkins, 395 U.S. 653, 671 (1969).
applies equally well to \textit{Brulotte} and to \textit{Zenith}. Nevertheless, the fear of private extortion of a licensee remains part of the law. An attempt to reconcile \textit{Zenith} with \textit{Automatic Radio} reveals why this may be so.

2. \textit{Tie-ins}

\textit{Zenith}, a 1978 case, came twenty-eight years after \textit{Automatic Radio} and distinguished it. The \textit{Zenith} Court noted:

[W]e do not read \textit{Automatic Radio} to authorize the patentee to use the power of his patent to insist on a total-sales royalty and to override protestations of the licensee that some of his products are unsuited to the patent or that for some lines of his merchandise he has no need or desire to purchase the privileges of the patent. In such event, not only would royalties be collected on unpatented merchandise, but the obligation to pay for nonuse would clearly have its source in the leverage of the patent.\footnote{395 U.S. at 139.}

The Court's emphasis on “protestation of the licensee” indicates that the Court was worried about a tie-in. According to the Court, it seems the licensee in \textit{Zenith} could have bought the package or nothing at all, while the licensee in \textit{Automatic Radio} could have negotiated for any combination of patent terms, but chose to purchase a package of which it later tried to rid itself. In the Court's view, in \textit{Zenith}, but not in \textit{Automatic Radio}, the items in the package were tied together.\footnote{Id. at 137.}

The antitrust laws treat patent tie-ins as an unlawful extension of an otherwise valid exclusive right. Perhaps the most important case regarding patent tie-ins is \textit{International Salt Co. v. United States}.\footnote{332 U.S. 392 (1947).} \textit{International Salt} owned patents on two machines for utilization of salt products. The principal method of distribution for each of these machines was under leases that required the lessee to purchase from the patentee all the salt consumed in the leased machines. Salt, of course, is not patented. The Court found that these leases foreclosed salt sales competition between \textit{International Salt} and its competitors, and held that it is unlawful per se to foreclose competitors from a market.\footnote{The Court found a violation of § 1 of the Sherman Act as well as a violation of § 3 of the Clayton Act. \textit{Id.} at 396. For an explanation of the latter provision, see \textit{supra} note 12.}

Why did the Court give tie-ins such harsh treatment? The “foreclosure” line of reasoning indicates that the Court was worried about a patentee parlaying a patent in one market into a monopoly in another. According to this theory, a licensee values salt machines; thus, the licensee will promise to buy salt from a patentee, even at an inflated price, just to be able to use the valuable machine. The patentee then will have the power to raise the price of salt above market price. The patentee could earn monopoly profits at the cost to society of foreclosed competition and inefficiently low production.

We have already seen why this will not occur. Recall the discussion of
Brulotte and Zenith. No licensee will pay more for a license than the license is worth to the licensee. Conversely, the patentee may not need to accept less than the same value. Thus, even without attaching strings, the patentee could, under some circumstances, charge the licensee the value of the license to the licensee. And no matter what strings attach, the patentee can charge no more. To illustrate, if International Salt charged an exploitative price for salt to be used with its machines, it would have to reduce by an exactly offsetting amount the price it could otherwise charge for the use of the machines. Licensees are interested in the utility of salt; neither salt itself nor the machines have independent value. International Salt, then, has no interest in monopolizing the salt market through its patent. Indeed, International Salt would wish to have the most efficient salt producer sell to its machine licensee at the lowest possible price. Cheap salt makes the processing less costly overall. As salt becomes less expensive, the licensed machine becomes more valuable.

One might ask why patentees tie other products to the sale or license of their patents. One explanation offered by International Salt is that the patentee may wish to guarantee that products used with the patented item are of high quality. In International Salt, the company claimed that it feared that another company's bad salt would damage the patented machines' performances. The consumer, it argued, would be unable to tell whether the machine or the salt was faulty. Demand for the machines might fall. International Salt argued that it could guarantee good machine performance only by supplying its own good salt. The Court did not reject this argument in theory, it simply did not believe the company's claim. The Court noted that International Salt could have achieved quality control by regulating the quality of the salt that a licensee could purchase from other salt producers.

Another explanation is analogous to the one relied upon in Automatic Radio. Packaging products might be the most convenient way to sell them. For example, a shirt manufacturer is unlikely to have any ulterior motive when tying buttons. It would be too expensive to produce a line of buttonless shirts for the few people who would buy them and then sew on their own buttons. Similarly, a machine patent holder might wish to produce a patented machine and integrate unpatented component parts. In sum, it might be more efficient to sell packages and only packages. Despite the per se rule set out in International Salt, today there is little doubt that a patentee who can demonstrate such integration lawfully will be able to market the packaged invention.

28. See supra notes 14-19 and accompanying text.
29. 332 U.S. at 397-98. Note that the Court's very consideration of this quality control argument belies the case's per se rule. Nevertheless, at least nominally, International Salt's per se rule remains law. Cf. Jefferson Parish Hosp. Dist. No. 2 v. Hyde, 466 U.S. 2 (1984), which accepts the per se rule, but dilutes it to the extent that a party must first have market power before a tying arrangement can be adjudged invalid.
30. See Jefferson Parish Hosp. Dist. No. 2 v. Hyde, 466 U.S. 2 (1984). See also paragraphs (c) & (d) of 35 U.S.C. § 271, which, taken together, permit a patentee to tie use of his patent to the sale of "a component of a patented machine, manufacture, combination or composition.
The International Salt holding is not, however, completely illogical. The foregoing discussion indicates that a patentee cannot use a patent to earn profits in excess of the value of a patented product or process to a licensee. Behind this conclusion, however, it is evident that a patentee can use tie-ins to earn profits, not in excess of the patent's value, but in excess of the profits available absent the tie-ins. In essence, although a patentee can never obtain from a licensee more than the patent's worth, a patentee may be able to "extort" a portion of that worth normally captured in consumer surplus. To illustrate, assume International Salt entered a competitive market to sell licenses for its patented salt machines. Given that the machines have no perfect substitutes, International Salt would face a downward sloping demand curve that might be as described by Illustration 4:

Illustration 4


31. The marginal cost of marketing any number of licenses for an existing patent may well be approximately zero. This is not important for this illustration, however.
Assume that International Salt grants licenses at a single price, $P_m$. Shaded triangle I represents licensee consumer surplus. Consider the $i$th license sold. The licensee who purchased that license was willing to pay a higher price, e.g., $P_i$, representing the value of the license to that licensee. Because the license is available at the lower price, this licensee has benefited in an amount equal to $P_i - P_m$. This is that licensee's consumer surplus. Shaded triangle I is the sum of $P_i - P_m$ for all purchasers who would have been willing to pay more than $P_m$ for the license. Now, what would happen if International Salt somehow knew the value of its license to each putative purchaser? The first and most obvious effect would be that the company would charge each purchaser the value of the license to that purchaser. There would be no one market clearing price; each purchaser would pay its $P_i$. Consumer surplus would disappear. International Salt would convert the area in triangle I from consumer surplus to additional profit. It may be difficult and costly, however, for International Salt to determine each purchaser's imputed evaluation. A tie-in may aid in this process.

Remember, a licensee values salt use, not salt or salt machines separately. It is therefore reasonable to assume that a licensee using a great deal of salt highly values a cost-saving machine. Such a licensee presumably will get more productive use out of the machine than will a licensee who uses less salt. This observation creates an opportunity for price discrimination. International Salt could sell its licenses at a low price on the condition that the licensees purchase salt only from International Salt. The company could then charge an above-market price for salt that licensees will be willing to pay because the license package includes a break on using the machines. The effective price to each licensee of machine use will vary according to that licensee's salt use, but will never exceed the value of the machine license to the licensee (once again, no licensee would pay more for a package than the package is worth to that licensee). International Salt can use salt purchases to meter the value of its patent to each licensee, discriminating in the price for machine use by charging each licensee the full value of the use that the licensee makes of the machine.  

That tie-ins can facilitate price discrimination does not, however, necessarily mean that tie-ins are anti-competitive and deserving of prohibition. As we have seen, despite discrimination, the patentee cannot extend patent-created power to earn profits beyond the value that the patent creates for the economy. On the other hand, allowing price discrimination might produce incentives beyond those necessary to induce the invention in the first place. This dilemma is the one we addressed in Part I(A) of this article regarding optimal patent protection. Here, as there, it is difficult to determine what is sufficient

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32. For further analysis of International Salt, see Peterman, The International Salt Case, 22 J.L. & ECON. 351 (1979). See also IBM Corp. v. United States, 298 U.S. 131 (1936) (another case arguably involving tie-in metered price discrimination; IBM's leases of tabulating machines conditioned on use only of IBM's own cards held violation of Clayton Act).
protection. Here, however, one wonders if added incentive to a patentee is harmful to the economy whether or not there is an overincentive. It is quite likely that a monopolist's or an exclusive producer's price discrimination is beneficial. Let us look again at International Salt's license market, but this time we will assume that the company can tie salt sales to its licenses so that it may price discriminate in a manner described by Illustration 5:

A price-discriminating producer such as International Salt will not set a single price at $P_m$ as it would if there were no price discrimination. Such a producer can charge a lower price for lower demand customers and not lose the opportunity to charge more to higher demand customers. Thus International Salt's marginal revenue curve coincides with the demand curve. Although the patentee now captures the consumer surplus in trapezoid II in addition to that in triangle I, dead weight loss is also eliminated, resulting in more efficient use of resources. This efficient allocation is not inexorable. For example, the monopolist might not be able to estimate demand accurately and might inadvertently reduce output. Nevertheless, even if there is no resultant benefit
to society, it would be unwise to expend resources punishing tie-ins under the antitrust laws. Such expenditure certainly seems unwise where patent tie-ins of complementing inputs provide relatively accurate information that can form the basis for useful price discrimination.33

3. Business Combination

Business combinations between patentees and licensees represent a third and, as we shall see, an important category of cases in which the Court has prohibited patent exploitation.

a. Vertical Arrangements

While a patentee is subject to antitrust scrutiny when a license to a separate business entity includes restrictive clauses, case law indicates that not all such contracts are combinations that violate the antitrust laws. In *E. Bement & Sons v. National Harrow Co.*,34 the Supreme Court held that it was not unlawful for a patentee and licensee contractually to fix the price that the licensee must charge for the products manufactured using the patent. Referring to *Bement* in a later case, the Court stated that the Sherman Act "clearly does not refer to that kind of a restraint of interstate commerce which may arise from reasonable and legal conditions imposed upon the assignee or licensee of a patent by the owner thereof, restricting the terms upon which the article may be used and the price to be demanded therefor."35 This conclusion is correct.36 Once an inventor has achieved a patent, there will be either direct or indirect costs in exploiting that patent. Assume an inventor has discovered a new gas-saving engine. Post-invention, the intellectual property component of engine production has a zero marginal cost. Physical production, however, has a positive marginal cost in a market that might be as described by Illustration 6:

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34. 186 U.S. 70 (1902).


36. The conclusion *alone* is correct. The Court seems to have completely mischaracterized the facts in *Bement*. See Priest, *Cartels and Patent License Arrangements*, 20 J.L. & Econ. 309, 330-32 (1977) (arguing that scheme involved in *Bement* was in fact restraint of trade).
The inventor would like to maximize profits by selling $Q_1$ engines at a price of $P$, per engine. But assume that the inventor is a high-brow type who knows not the first thing about organizing an engine factory. The inventor, therefore, will license the invention to an engine manufacturer. The royalty price should be $P_1 - P_0$. At this price the patentee will be able to capture the economic rents that serve as a reward for ingenuity. It is clear that this licensing scheme will not maximize the licensor's profits unless there is a maximum price clause, or something with like effect, in the license agreement. Assume that such a clause is absent, and the market from the manufacturer's perspective may be as described by Illustration 7:

37. This assumes that marginal cost includes a full, non-economic return on the labor and capital used in the physical production process. This is so for reasons that, if not obvious, are beyond the scope of this article.
The manufacturer is now the exclusive user and will seek rents in excess of the patentee's. Thus \( Q_2 \) engines will sell for a price of \( P_2 \). This is at a higher price and a lower quantity than would prevail with the price restraint and creates additional dead-weight loss. Moreover, the patentee is now worse off because total royalty payments will be those represented by rectangle I, as compared to the royalty payments (represented by the sum of rectangles I and II) received under a system of price restraint. Thus, although the fear of cut-off may chill a licensee from charging too much, the easily monitored and enforced fixed maximum price may be the best way to ensure efficient exploitation of a patent.\(^{38}\)

\(^{38}\) One might think it obvious that maximum price restraint is lawful under the antitrust laws. As logical as this is, the law is to the contrary. Maximum price restraints are unlawful just as minimum price restraints are unlawful. See Albrecht v. Herald Co., 390 U.S. 145 (1968) (both maximum and minimum price restraints per se violations of Sherman Act). See also Dr. Miles Medical Co. v. John D. Park & Sons Co., 220 U.S. 373 (1911) (minimum price restraints unlawful).
Consideration of minimum price restraint does not change the result. Assume the same engine design patentee finds it convenient and efficient to license to a number of competing manufacturers. Assume the competing manufacturers put the engine in cars and sell the cars to the public. To sell each car, each manufacturer would engage in costly explanation and demonstration designed to convince the consumer that the cars with the new engines are worth their selling price. Absent minimum price restraint, one manufacturer might ride free on another's sales pitch. Manufacturer One might observe Manufacturer Two spending time and money touting the new engine. Manufacturer One might then sell its cars, with the same engine, for a price less than Manufacturer Two's price; the price reduction could be equal to the cost of Manufacturer Two's sales effort. Rational consumers will listen to Manufacturer Two and buy from Manufacturer One. Rational manufacturers in Manufacturer Two's position will stop providing the sales information. This free riding will injure the economy generally as well as the patentee. Consumers will be deprived of the efficient provision of sales information about the new engine. The patentee will lose royalties because the licensees will sell fewer cars that contain the engine.\(^9\) Prohibiting minimum price restraints might cause inefficiencies in addition to the one described.\(^4\) We need not discuss these here. Suffice it to say that there are situations in which it is efficient to allow a patentee and a licensee to set ultimate product prices.

Once we realize that patentee/licensee price agreements can be efficient, it follows that the antitrust laws should not prohibit such agreements when they are free from other anti-competitive infirmity. We are willing to allow patentees themselves to market their patented products and in doing so to set prices that exploit the patent to its fullest extent. The foregoing discussion demonstrates that price-fixing allows the patentee to achieve full exploitation. Nothing in this discussion, however, indicates that a patentee can use licensee price agreements to enhance a patent's rents at the expense of economic efficiency. We have already seen why. If a patentee who is fully exploiting a patent attempts to raise the price of a license or of a licensee's final product, a profit-reducing decline in sales will follow.\(^41\) Despite the logic of this position, permissible price restraint is not the law for all patent license arrangements. Eleven years after Bement, the Court held in Bauer v. O'Donnell\(^42\) that a patentee could not restrict a licensed article's resale price.

\(^{39}\) The Supreme Court has recognized this free rider problem. Continental T.V., Inc. v. GTE Sylvania, Inc., 433 U.S. 36 (1977). "Because of market imperfections such as the so-called 'free rider' effect . . . services might not be provided by retailers in a purely competitive situation, despite the fact that each retailer's benefit would be greater if all provided the services than if none did." Id. at 55 (citations omitted).


\(^{40}\) See Priest, *supra* note 36, at 318-19.

\(^{41}\) See *supra* notes 14-19 and accompanying text (discussion of Brulotte and Zenith). See also Easterbrook, *supra* note 39, at 145-52.

\(^{42}\) 229 U.S. 1 (1913).
Returning to Illustration 6, this means that the patentee and manufacturer-licensee could not dictate retail prices to an independent automobile retail distributor. This is absurd. As Justice McKenna noted in dissent in Bauer, there is no plausible distinction between price maintenance and resale price maintenance in terms of permissibility in patent licensing agreements. Each sets the prices that the ultimate consumer will pay.43

Bauer is an old case. Time and logic notwithstanding, however, resale price maintenance remains unlawful under the antitrust laws in both patent licensing and other settings.44 A patentee is thus foreclosed from using an efficient form of distribution. Moreover, a patentee may not even take advantage of Bement's primary price maintenance if the licensees are or were competitors. In United States v. Masonite Corp.,45 for example, Masonite held a patent to produce hardboard. Masonite sold hardboard directly to consumers and also licensed other building material suppliers to sell the product. These other suppliers were designated as agents; Masonite fixed the price and term of sales through the agents, some of whom had a competing patent but did not use it. Each agent sold Masonite hardboard and received a commission according to the terms of the agency license. The Court held that the license arrangement was a combination in violation of Sections 1 and 2 of the Sherman Act:

The power of Masonite to fix the price of the product which it manufactures, and which the entire group sells with respect to which all have been and are now actual or potential competitors, is a powerful inducement to abandon competition. The extent to which that inducement in a given case will have or has had the desired effect is difficult, if not impossible, of measurement. The forces which that influence puts to work are subtle and incalculable. Active and vigorous competition then tends to be impaired, not from any preference of the public for the patented product, but from the preference of the competitors for a mutual arrangement for price-fixing which promises more profit if the parties abandon rather than maintain competition.46

The Court got this one wrong. Masonite did not form a cartel with its agents. Rather, Masonite used the power inherent in its hardboard patent to turn the competitors into distributors. Studies of the market indicate that the agents' royalties were quite small.47 It is true that Masonite did not compete with its agents. But the small royalties make it clear that the agents did not benefit from the reduction in competition as they would have benefited were they cartel members. Masonite built a better mouse trap, and

43. Justice McKenna's Bauer dissent does not appear in the official report of the case. For his views, see W. Bowman, supra note 19, at 150.
44. The Court's language was, "Retail price maintenance is not only designed to, but almost invariably does in fact reduce price competition not only among sellers of the affected product, but quite as much between that product and competing brands." Continental T.V., Inc. v. GTE Sylvania, Inc., 433 U.S. 36, 51 n.18 (1977) (Brennan, J., concurring) (quoting White Motor Co. v. United States, 372 U.S. 253, 268 (1968)).
45. 316 U.S. 265 (1942).
46. Id. at 281.
47. See Priest, supra note 36, at 350-55.
the agents beat a path to its door. Masonite used the agency agreements and price-setting scheme merely to exploit its patent fully and effectively. Masonite's competitors were in the best position to distribute hardboard. The alternative was for Masonite alone to distribute its own product, possibly forcing its former competitors out of business.

The Court did not reject these pro-competitive arguments as incorrect. Rather, it considered them to be irrelevant:

Since there was price fixing, the fact that there were business reasons which made the arrangements desirable . . . , the fact that the effect of the combination may have been to increase the distribution of hardboard, without increase of price to the consumer, or even to promote competition between dealers [is not] legal justification for price-fixing."

In sum, the Court confused product pricing with cartel price-fixing and, as a result, lost sight of antitrust law's purposes. This faulty analysis in the Masonite case of cartel formation raises the issue of patent licensing as a cartel facilitation practice.

b. Horizontal Arrangements

Perhaps the most famous case of an alleged patent cross-licensing cartel is Standard Oil Co. (Indiana) v. United States.49 Before 1910, gasoline had been manufactured from crude oil exclusively by distillation. As the demand for gasoline grew, innovators discovered ways to "crack" crude oil, and thereby produce more gas than distillation could produce. Cracking involved applying heat and pressure to the residuum after ordinary distillation. No fundamental patent controlled the process of cracking. Patents on various aspects or alternatives of the process competed in the market. Beginning in 1920, conflict developed among four oil companies that were competing patent holders; the disputes concerned the validity, scope, and ownership of issued patents. The companies settled their disputes by, in essence, pooling the patents; each company received a fixed proportion of the proceeds from a pool of profits that a prearranged royalty schedule provided. All patents were cross-licensed among competitors within the pool. The Justice Department invoked the Sherman Act to challenge this cross-licensing arrangement. The Department characterized the dispute settlement as a cartel to fix gasoline prices. The Supreme Court disagreed:

If combining patent owners effectively dominate an industry, the power to fix and maintain royalties is tantamount to the power to fix prices . . . . [W]here domination exists, a pooling of competing process patents, or an exchange of licenses for the purpose of curtailing the manufacture and supply of an unpatented product is beyond the privileges conferred by the patents and constitutes a violation of the Sherman Act . . . . But an agreement for cross-licensing and division of royalties violates the Act only when used to effect a monopoly, or to fix prices, or to impose otherwise an unreasonable restraint on interstate commerce . . . . We must, therefore, examine the evidence to ascertain the operation and effect of

48. 316 U.S. at 276.
49. 283 U.S. 163 (1931).
the challenged contracts . . . . No monopoly, or restriction of competition, in the production of either ordinary or cracked gasoline has been proved. The output of cracked gasoline in the years in question was about 26 percent of the total gasoline production. Ordinary or straight run gasoline is indistinguishable from cracked gasoline and the two are either mixed or sold interchangeably. Under these circumstances the primary defendants could not effectively control the supply or fix the price of cracked gasoline by virtue of their alleged monopoly of the cracking processes, unless they could control, through some means, the remainder of the total gasoline production from all sources. Proof of such control is lacking. 50

It is encouraging to see the Court applying economic analysis in its decision. It is unfortunate, however, that the Court did not thoroughly analyze the problem. If the defendants together monopolized the cracking process, they might have been able to fix the prices and curtail the supply of gasoline notwithstanding their lack of domination in the gasoline market. 51

Assume that competing cracking patents create the same cost curves for the production of gasoline. The market for gas might be as described by Illustration 8:

Illustration 8

50. Id. at 174-77. George Priest suggests that the cracking patents in issue covered virtually one hundred percent of the gasoline market. Priest, supra note 36, at 369-71. For the purposes of discussion in the text, however, we will assume the facts were as the Court saw them.

51. Professor William Landes first explained this possibility.
Absent the combination among cracking patent holders, the gas market would clear at \( P_o, Q_o \), with \( Q_o - Q_d \) gallons produced by cracking and \( Q_d \) gallons produced by distilling. If any of the cracking competitors attempted to raise its price above \( P_o \), another of the competitors would undercut that competitor, picking up sales and returning the market to equilibrium at \( P_o, Q_o \). But now assume that the cracking patent holders have cartelized, combining interests. The combination's market, based on the residual demand from the entire market, would be described in Illustration 9:

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52. The residual demand curve consists of the difference between \( D \) and \( MC \) (distilling) in Illustration 8. That difference is zero at \( P_i \).
The cartel will sell \( Q_c \) gallons of gas at \( P_c \). The entire gasoline market would be as described by Illustration 10:

Illustration 10

The market will now clear at \( P_r, Q_r \). This represents a higher price and a lower quantity than \( P_o, Q_o \). Thus the cracking cartel could be effectively anti-competitive even without its control over the distilling process. Moreover, the new market clearing equilibrium contains inefficiencies that go beyond increased price and diminished quantity. If only \( Q_1 \) gallons are produced, cracking should supply \( Q_1-Q_3 \) gallons. In fact, the cartel cracks \( Q_1-Q_2 \) gallons. Distilling supplies \( Q_2 \) gallons, \( Q_2-Q_0 \), of which cracking could have produced more efficiently. There is a misallocation of production resources.

Although the Standard Oil Court failed to recognize these problems, the Court's conclusion may have been correct nevertheless. The foregoing ana-

\[ 53. \) \( Q_1-Q_2 \) gallons in Illustration 10 equals \( Q_s \) gallons in Illustration 9.

\[ 54. \) Note, however, that this misallocation will not occur if the distilling supply curve rises solely because of increasing input costs. See infra text accompanying note 114.
ysis suffers from the now familiar fallacy of post hoc rationalization. If the competing cracking inventions were expensive to discover, competition among them could result in negative returns for each inventor. Ex ante each inventor might not have invested time and resources absent the expectation that a discovery would at least share with comparable discoveries the fruits of innovation. On the other hand, sanctioning the combination of competing patents may provide an unnecessary incentive to innovation. This possibility will be discussed in Parts II and III of this article.55

In United States v. Line Material Co.,56 the Court erred in a different direction than in Standard Oil. In Line Material, the Court struck down a patent cross-licensing agreement between competitors solely because the agreement involved price restrictions between competitors. The challenged arrangements centered around three product patents that were useful in protecting an electric circuit from the dangers incident to a short circuit or other overload. Defendant Line Material Company held a patent that was useful only in conjunction with the technology made possible by a patent held by defendant Southern States Equipment Corporation. The defendants, therefore, entered into a bilateral, royalty-free, cross-license agreement that, inter alia, fixed the price of products manufactured using the patents. The Court recognized that the patents were most useful when used together, but held that:

[W]hen patentees join in an agreement as here to maintain prices on their several products, that agreement, however advantageous it may be to stimulate the broader use of patents, is unlawful per se under the Sherman Act. It is more than an exploitation of patents. There is the vice that patentees have combined to fix prices on patented products.57

The Line Materials Court attempted to distinguish Standard Oil by stating that "where an arrangement by which the patentees pooled their oil cracking patents and divided among themselves royalties from licensees fixed by the pooling contracts was upheld, the theory was reiterated that a price limitation for the product was unlawful per se."58 This distinction, seemingly between royalty price and retail price, is disingenuous. In Standard Oil the defendants pooled their cracking patents through a cross-licensing arrangement that included a complex royalty schedule. The licensees and sublicensees subject to this schedule may not have been explicitly subject to price restraint, but the royalties served to impose a minimum price upon the licensees, if not directly, at least through their sublicensees. The Standard Oil Court recognized this in its conclusion that "If combining patent owners effectively dominate an industry, the power to fix and maintain royalties is tantamount

55. This is precisely the dilemma that one faces when one attempts to decide what is the optimal patent life. See supra text accompanying notes 2-13.
56. 333 U.S. 287 (1948).
57. Id. at 314-15. Note that the Court found, but did not rely upon, the fact that the patents together dominated the market for circuit protection devices.
58. Id. at 313.
to the power to fix prices." The *Standard Oil* agreements were lawful not because they did not fix prices, but because, in the Court's view, they did not restrain trade.

*Line Material* might have been decided differently if the Court had adhered to *Standard Oil* and had examined the agreements at issue under a restraint of trade standard instead of imposing per se invalidity. Remember that the Court found one patent in *Line Material* "blocked" the other; that is, the second patent was not useful without the first. To illustrate, assume that, before innovation, the market for safe electrical appliances looked as described by Illustration 11:

![Diagram](image)

The market would clear at $P_0$, $Q_0$.

Now assume that the *Line Material* innovations exist, but are not used together. Only the first innovation will affect the market because the second innovation is blocked by the first. The market would look like as described by Illustration 12:

59. 283 U.S. at 174.

60. The contours of this graph are not empirically necessary. The same could be said for Illustration 13, *infra*. No implicit assumption in these illustrations detracts in any way from the conclusions in the text, however, see *supra* note 7.
Illustration 12

The market will clear at $P_1$, $Q_1$.

Innovation One's patentee will earn the economic rent that rectangle I represents.

Now allow the combination of Innovations One and Two, and assume that the patentees of these innovations completely combine their interests. The market would look as described by Illustration 13:
The market would clear at $P_2$, $Q_2$. The patentees' combined rents would increase to the amount that rectangle I represents, but the combination is unambiguously beneficial. The combination is unambiguously beneficial because $Q_2$ is greater than $Q_1$, and $P_2$ is less than $P_1$.\(^{61}\) Compare *Standard Oil*, analyzed in Illustration 9 and the surrounding text. There, combining the existing cracking patents effected an increase in gasoline price and a

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\(^{61}\) Note that this analysis assumes *completely complementary* patents, described in the text as "blocking." In general, complementary patents may at the same time enhance one another and substitute for one another. Imagine patented photo chemicals that together bring out the brightest pictures possible, and that even individually offer great improvements over alternative chemicals. Combining these patents would not be unambiguously beneficial. On the one hand, the chemicals are most effectively used together. On the other, uncombined, the chemicals might compete with one another, driving price down and production up. The latter effect is the same one described with regard to competitive patents. *See infra* text accompanying note 61. Thus, we see that patents can be complementary and competitive at the same time. (Much thanks to William Landes for the idea behind this footnote.)
decline in gasoline output. We noted that the laws should, perhaps, allow such a combination anyway, because absent the combination and its economic rents there may be too little incentive for future inventors who, ex ante, might be similarly situated to the cracking patent inventors. In the Line Material illustration, we face no similar weighing of foregone current benefits against possible disincentive effects. In Line Material, even given the existing patents, allowing combination and its monopoly effects is preferable to disallowing the combination.

One might ask why a price restraint or other interest-combining agreement between patentees must be allowed in order to achieve this beneficial patent use. The answer is simple. Without the restraint inherent in Illustration 13, the patentees would have little interest in licensing their patents to each other. The patentees are locked into a bilateral monopoly. Together the patents are worth more than the summed value of each separately. The patentees will agree on a division of interest in the combined patents, but that agreement must contain a provision that protects the value of the combination. George Priest describes the process as follows:

[Since ... cross-licensing makes each [patentee] a competitor of the other, the two must agree to restrain sales to avoid competing away the patent rents. Without a price restraint, either could charge a smaller ... rent for its own patent and cut the price or royalty for the combination to increase relative sales. A price restriction or division of royalties would be necessary to forestall competing away the ... rents for each firm's own patent. Yet for cross-licenses of this nature, the price restriction or division of royalties allows each firm to garner no greater than legitimate returns for its innovation and is no index of horizontal restraint.]

This analysis has some support in the case law. Prior to Line Material, the Court had recognized a patentee's need to use price restraint or a similar arrangement fully to exploit a patent. In United States v. General Electric Co., General Electric owned patents that entirely controlled the manufacture, use, and sale of tungsten incandescent lamps. General Electric's license agreement with Westinghouse, its largest competitor, allowed General Electric to fix the price of lamps sold under the license. The Court held that a patentee could assign markets for, or fix prices of, a patented product, "provided the conditions of sale are normally and reasonably adapted to secure pecuniary reward for the patentee's monopoly."

The Court in Line Material distinguished General Electric, characterizing the latter's holding as a proposition that absent "a conspiracy to restrain trade or an effort to monopolize ... a patentee may license another to
make and vend the patented device with a provision that the licensee’s sale price shall be fixed by the patentee.’’ The Court believed that unlike Line Material, General Electric involved no effort to restrain trade or monopolize. This “distinction” is astonishingly unpersuasive. The question at issue in both General Electric and Line Material was precisely whether an agreement on price in a licensing agreement itself is a conspiracy to restrain trade or an effort to monopolize. Both cases included price restriction agreements. Both cases involved agreements between competitors—though the General Electric Court somehow ignored the fact that Westinghouse was a competitor. One difference between the cases is that Line Material involved cross-licenses, while General Electric involved only a direct license. This difference, however, logically is not an important one. Indeed, as seen in Masonite, a patentee may violate the law by granting a competitor a one-way restrictive license. Yet the Court invokes a per se rule in Line Material at the same time it claims to uphold its decision in General Electric. These cases do not appear reconcilable.

In sum, the Court’s unwillingness to explore fully the economics of patent exploitation explains the confusion illustrated by contrasting General Electric and Standard Oil with Line Material and Masonite. This confusion in the law of horizontal licensing is similar to that which we have seen throughout this article. Is there a way out of the quagmire? It appears so. And it lies in a case that does not involve patents.

II. Broadcast Music and the Rule of Reason Applied to Patent Exploitation

A. The Broadcast Music Case

The Supreme Court’s 1979 decision in Broadcast Music, Inc. v. Columbia Broadcasting System, Inc., 67 changed the direction of antitrust law. The case involved associations of music copyright holders. Since 1897, the copyright laws have vested in the owner of a copyrighted musical composition the exclusive right to perform the work publicly for profit. 68 In 1914, a group of composers organized the American Society of Composers, Authors, and Publishers (ASCAP). Those who performed copyrighted music for profit were so numerous and widespread, and most performances so fleeting, that as a practical matter it was impossible for the many individual copyright owners to negotiate with and license the users and to detect unauthorized uses. ASCAP was organized as a “clearing house” for copyright owners and users to solve these problems associated with the licensing of music.

66. 333 U.S. at 304.
69. 441 U.S. at 5.
At the time of Broadcast Music, ASCAP had 22,000 members, each of whom granted it nonexclusive rights to license performances of their works. ASCAP issued licenses and distributed royalties to copyright owners with a schedule reflecting, *inter alia*, the nature and amount of the use of their music. Broadcast Music, Inc. (BMI) was a similar organization and operated in a similar fashion. ASCAP and BMI together had in their repertories almost every composition copyrighted under United States law.

Litigation arose because both ASCAP and BMI operated primarily through blanket licenses that gave licensees the right to perform any and all of the compositions owned by members or affiliates for a stated term as often as the licensees desired. Fees for blanket licenses were ordinarily a percentage of a licensee's total revenue, or a flat amount, and did not directly depend on the amount or type of music used. Until the litigation, plaintiff CBS held a blanket license from each organization. CBS sued defendants ASCAP and BMI, contending that the antitrust laws required these organizations to make all of their compositions available at standard per-use rates within negotiated categories of use. If such standard per-use rates were themselves found to be violative of the antitrust laws, CBS argued in the alternative, an injunction should issue forbidding the defendants to issue any blanket license or to negotiate any fee except on behalf of an individual member for the use of that member's own copyrighted work or works. Plaintiff's theory rested on its characterization of the blanket licenses as a per se unlawful conspiracy among composers to fix prices for copyrighted works.

The Court rejected CBS's contention that the blanket license was per se invalid:

In the first place, the line of commerce allegedly being restrained, the performing rights to copyrighted music, exists at all only because of the copyright laws. Those who would use copyrighted music in public performances must secure consent from the copyright owner or be liable . . . for . . . damages . . . . Although the copyright laws confer no rights on copyright owners to fix prices among themselves or otherwise to violate the antitrust laws, we would not expect that any market arrangements reasonably necessary to effectuate the rights that are granted would be deemed a per se violation of the Sherman Act. Otherwise, the commerce anticipated by the Copyright Act and protected against restraint by the Sherman Act would not exist at all or would exist only as a pale reminder of what Congress envisioned.

The Court went on to explain why the blanket license might be "reasonably necessary to effectuate the rights granted" by the Copyright Act:

The blanket license, as we see it, is not a "naked restrain[t] of trade with no purpose except stifling of competition," but rather accompanies the integration of sales, monitoring, and enforcement against unauthorized copyright use . . . . Most users want unplanned, rapid, and indemnified access to any and all of the repertory of compositions, and the owners want a reliable method of collecting for the use of their copyrights . . . .

70. *Id.* at 18-19.
A middleman with a blanket license was an obvious necessity if the thousands of individual negotiations, a virtual impossibility, were to be avoided. [The] substantial lowering of costs, which is of course potentially beneficial to both sellers and buyers, differentiates the blanket license from individual use licenses. The blanket license is composed of the individual compositions plus the aggregating service. Here, the whole is truly greater than the sum of its parts; it is, to some extent, a different product. ASCAP [and BMI], in short, made a market in which individual composers are inherently unable to compete fully effectively.  

Finally, the Court concluded that where an arrangement such as the blanket license may be pro-competitive, courts should apply a "rule of reason" and weigh the arrangement's value against its anti-competitive effects:

71. Id. at 20-23 (citations omitted).

72. "[T]he inquiry mandated by the Rule of Reason is whether the challenged agreement is one that promotes competition or one that suppresses competition." National Soc'y of Professional Eng'rs v. United States, 435 U.S. 679, 691 (1978) (invalidating Society's ban on competitive bidding).

73. 441 U.S. at 24.

middleman with a blanket license was an obvious necessity if the thousands of individual negotiations, a virtual impossibility, were to be avoided.” 75 This explains the middleman. Nothing in the opinion explains why a middleman, once established, could not negotiate on behalf of individual composers if the licensee were willing to pay the costs of individual negotiation. Apparently CBS was willing to pay that cost. The Second Circuit sidestepped the issue, ironically holding that CBS could demonstrate no restraint of trade because the network failed to prove that it was not feasible for it to engage in individual negotiations either directly with the composers or with middlemen independent of ASCAP or BMI. At one point in the opinion, the court speculated as to why CBS, given these alternatives, brought the lawsuit. 76 Why indeed?

One answer is that CBS wanted to avoid the blanket license because that license is a sophisticated form of price discrimination that captured from CBS some or all of its consumer surplus. To illustrate, assume all compositions are equally valuable and that a music clearinghouse with market power, ASCAP for example, sold a license for each musical composition individually. The market for compositions might be as described by Illustration 14:

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75. 441 U.S. at 20.
76. 620 F.2d at 936-37.
Absent the ability to price discriminate, the market would clear at \( P_o \), \( Q_o \). Licensees would capture the value in triangle I. This is consumer surplus. Now assume that ASCAP knows how much each licensee would pay for compositions. ASCAP would simply charge for each unit what each unit is worth to each licensee. The market would be as described by Illustration 15:

The market would clear at \( Q_1 \). There would be no set price. Each license would sell at a different price. This is an efficient outcome from society's standpoint. The marginal cost of supplying music for performance is approximately zero; once a song is written, it is virtually costless to supply. Thus, it is a better allocation of resources for the composers to license \( Q_1 \) songs rather than the \( Q_o \) songs licensed in Illustration 14.\(^78\) The efficient

\(^77\) The marginal cost of producing musical compositions for performance is approximately zero. Most of the actual cost is fixed in composing.

\(^78\) The quantity of composition for the market including many purchasers will, of course, include multiple licensings of the same song.
allocation in Illustration 15 is possible because price discrimination enables the composer to capture the licensees' consumer surplus—represented by triangle I—which compensates the composers for their fixed investment in writing the songs.

The blanket license comes into play because, as seen in Illustration 14, the demand curve is made up of many fewer consumers than licenses. For example, CBS will demand many songs. Indeed, before the price reaches zero—the marginal cost of supplying each song\(^79\)—CBS will demand each song in ASCAP's repertory; it is always of some value to have the opportunity immediately to use any given song. How, then, does ASCAP sell compositions to CBS? To illustrate, assume CBS's demand curve is as described by Illustration 16:

\[\text{Illustration 16}\]

\[79. \text{See supra note 77.}\]
Based on CBS’s revenues, ASCAP knows approximately how much CBS values each song and each additional song. Because marginal cost is zero, ASCAP wishes to license its entire repertory. What are ASCAP’s options? It could calculate an average price per song for CBS, and license songs to the network at that price, $P_a$ in the illustration. At that price, however, ASCAP would license only $Q_a$ songs. ASCAP, therefore, offers only a blanket license. CBS must license the entire repertory at a price of $P_a$ per unit, or it may license no song. The blanket license allows ASCAP to supply the optimal number of licenses and, constrained only by the cost of direct composer licensing, to capture CBS’s consumer surplus.

Thus, as unfortunate as it may be for CBS and other licensees, the blanket license is efficient—it increases output until demand equals marginal cost, that here is zero—and should not be invalid under the antitrust laws. If the Second Circuit had thoroughly analyzed the blanket license, weighing pro-competitive versus anti-competitive effects, the court would have been on more solid economic ground when it approved the license.80

B. Broadcast Music and Patented Products

Under the rule of reason Broadcast Music has at least two implications for the antitrust laws. The first is general. Judge Frank Easterbrook, who as Deputy Solicitor General successfully argued Broadcast Music before the Supreme Court, has used the case to support the proposition that even horizontal restraints “may contribute to the success of a cooperative venture that promises greater productivity and output.”81 As a result, all restraints on trade should be examined carefully to determine whether even traditionally prohibited conduct is in fact likely to be anti-competitive. This appears to be the trend of recent Supreme Court authority. In Northwest Wholesale Stationers v. Pacific Stationery and Printing Co.,82 the Court recognized the possible pro-competitive efficacy of group boycotts.83 In Matsushita Electric Industrial Co. v. Zenith Radio Corp.,84 the Court noted the pro-competitive effects of low prices in its dismissal of a claim alleging predation. The

80. Of course, if the Second Circuit had truly found that CBS could bypass ASCAP and BMI and as cheaply go to alternative sources, then the foregoing price discrimination analysis would fail. One would then wonder why CBS brought the lawsuit. (ASCAP’s explanation, 620 F.2d at 936-37, is unpersuasive). In any case, the Second Circuit held only that CBS did not carry the burden of proving that alternative sources were not “feasible.”

81. Polk Bros. v. Forest City Enters., 776 F.2d 185 (7th Cir. 1985) (covenant not to compete between appliance dealer and building products dealer held ancillary to lease agreement and thus subject to rule of reason test).


83. The Court held that a group boycott does not warrant a conclusion that the boycott is anticompetitive unless the boycotting cooperative possesses market power or has exclusive access to an element essential to competition. Thus, a rule of reason analysis should apply.

84. 106 S. Ct. 1348 (1986).
possibility of successful predation was too remote to risk an antitrust inquiry that might chill price competition.

These recent cases represent a promising trend, but they do not spell total relief from the burden that illogical antitrust jurisprudence places on business. In another recent case, *Aspen Skiing Co. v. Aspen Highlands Skiing Corp.*, the Court upheld a decision imposing liability on a ski resort operator because it ended a joint venture with its direct competitor. Can one find in *Broadcast Music* a rule more specific than a rule of reason inquiry, yet applicable to virtually all patent licensing cases? The answer is yes.

The most important implication of *Broadcast Music* for patent cases arises from the language that describes "the line of commerce allegedly being restrained, the performing rights to copyrighted music, [as one that] exists at all only because of the copyright laws." As noted, the Court went on to say that

we would not expect that any market arrangements reasonably necessary to effectuate the rights that are granted would be deemed a per se violation of the Sherman Act. Otherwise the commerce anticipated by the Copyright Act and protected against restraint by the Sherman Act would not exist at all or would exist only as a pale reminder of what Congress envisioned.

This language carves out special treatment under the antitrust laws for congressionally granted exclusive rights. To be shielded or partially shielded from the antitrust laws, a restraint used to exploit a patent need not be absolutely necessary to exploit the patent. The emphasized language in the quote above makes sense. No marketing technique is truly necessary. The point is that severe restriction on marketing may turn a potentially profitable endeavor into an unprofitable one. The Court was instructing lower courts to take a second, hard look before allowing the antitrust laws to bite, because activity analogous to monopoly exploitation techniques are important production-enhancing elements in the fragile process of creating intellectual property—a process that Congress has specially sanctioned. The earlier decisions that we have looked at take too narrow a view of permissible

86. The Court found a violation of § 2 of the Sherman Act in the refusal of a major ski resort operator to continue offering interchangeable ski-lift tickets in conjunction with a smaller competitor.
87. 441 U.S. at 18.
88. Id. at 19 (emphasis added).
89. The fragile nature of desirable economic activity has led the Supreme Court to apply less than strict scrutiny under the antitrust laws even in fields outside of those that Congress has specially sanctioned. See NCAA v. Board of Regents, 104 S. Ct. 2948 (1984), where the Court applied a rule of reason analysis to a broadcasting plan involving horizontal price-fixing, a practice previously deemed a per se violation of the Sherman Act. Id. at 2960-61. But note the unfavorable outcome for the defendants anyway. The result reinforces the idea that patents and copyrights are special.
patent exploitation. They are, therefore, inconsistent with Broadcast Music and are of questionable validity.\(^9\)

This proposition is not merely abstract. Broadcast Music squarely addresses the issues we have seen in patent/antitrust law. The case includes a horizontal combination, price-fixing, and the tying together of products, each designed to exploit existing intellectual property rights. Instead of condemning these practices as it had done in the past, the Court decided to allow the practices if they were reasonable. There are no inefficient consequences in a patentee's attempt to license a patent through a complex financing arrangement not directly linked to the patent's use. Broadcast Music would, therefore, require a different result in Brulotte and in Zenith.\(^9\) Additionally, tie-ins to patented products have legitimate purposes and are so unlikely to be anti-competitive that they do not require antitrust scrutiny.\(^9\) The same can be said of patent licenses that include vertical price restraints.\(^9\) Broadcast Music would, therefore, require different results in International Salt, Bauer, and Masonite, regardless of the state of the law on tie-ins and vertical restraint for products that do not include congressionally granted rights of exploitation. Finally, the cross-licensing of blocking or complementary patents, even between competitors, will not necessarily be anti-competitive. Broadcast Music, then, though not directly addressing this particular issue, logically would require a different result in Line Material.\(^9\)

The logical result of Broadcast Music is not, however, per se validity for all patent licenses. It remains an open question whether or when a patentee's licensing of a patent to a competitor, or the cross-licensing of competitive patents, is, on balance, anticompetitive. The economic losses that these practices create may outweigh the economic benefits derived from the incentive to create; recall our discussion of Standard Oil.\(^9\) Horizontal licensing may be anti-competitive for one or both of two distinct reasons. First, horizontal licensing may serve as a screen for a cartel. Second, such licensing might substantially concentrate technological advantages in a single economic unit.

1. **Cartelization**

A patent grants to a patentee economic rents that are in some aspects similar to revenues that monopolies achieve through a cartel. In an article

90. The lower courts have been slow to credit the significance of the "reasonably necessary to effectuate [a congressional purpose]" language. Compare United States v. Studiengesellschaft Kohle, m.b.H., 670 F.2d 1122, 1130 (D.C. Cir. 1981) (suggesting that tying practices may still be illegal after Broadcast Music) with Instructional System Dev. Corp. v. Aetna, 787 F.2d 1395 (10th Cir. 1986) (paying lip service to language of Broadcast Music, then ignoring it). [The opinion published in the advance sheet at this citation was withdrawn from the bound volume because rehearing is pending. The opinion is reprinted in Trade Cas. 67,019 (CCH 1986).]

91. See supra notes 14-19 and accompanying text.

92. See supra notes 28-32 and accompanying text.

93. See supra notes 45-47 and accompanying text.

94. See supra note 61 and accompanying text.

95. See supra notes 52-54 and accompanying text.
on cartels and license arrangements, George Priest describes the resulting problem:

A cartel achieves returns by restricting output, and thereby setting price above cost, the same way the owner of a patent achieves returns from an invention. This indicates the difficulty of determining whether an arrangement of patent licenses embracing all or most of the firms in a given industry serves to exploit the value of a dominant patent or to disguise a cartel agreement . . . . A group of firms agreeing, in violation of the Sherman Act, either to fix prices or to allocate output, could disguise its agreement by obtaining a patent on an unimportant process and executing licenses to previously competing members which incorporate the provisions of the illegal agreement.

The Standard Oil case is useful to illustrate a cartel disguised as a patent licensing arrangement. The analysis in Part I assumed, as did the Court, that the defendants pooled valuable "cracking" patents and discussed the possible pro-competitive and anti-competitive effects of cross-licensing. Now assume instead that the patents were worthless, that they were either invalid or they provided no technological advantage over the cracking patent processes available in the public domain. Assume further that cracking was superior to distillation and that, as a result, virtually all gasoline was cracked. Absent cartelization the market might be as described by Illustration 17:

96. Priest, supra note 36, at 309.
97. See supra notes 49-54 and accompanying text.
98. This assumption appears to be correct. Priest points out that cracking produced ninety-four percent of all gasoline, not twenty-six percent, as the Court believed. Priest, supra note 36, at 369.
The market would clear at $P_0$, $Q_0$. Now assume that producers combine a large proportion of production, charging one another and sublicensees royalties on the worthless patents. Those royalties would raise the price of gasoline in the market. The price increase ostensibly would be a result of the increased cost attributable to the royalty payments. But the cartel recipients themselves would receive these payments, making the royalty cost merely a paper one. The cartel would set royalty prices so that the cartel as a whole could maximize profits. The market would be as described by Illustration 18:
The market would clear at $P_1$, $Q_1$. There would be a per unit royalty of $P_1 - P_0$. This arrangement is clearly anti-competitive because $P_1$ is greater than $P_0$ and $Q_1$ is less than $Q_0$. The cross-licensing creates no legitimate incentives to innovate because, by hypothesis, the case involves no innovation.

This anti-competitive result can occur even where a patentee licenses a non-worthless patent. A patentee might license a valid patent under conditions that restrain trade in excess of the restraint inherent in patent exploitation. To illustrate, assume a patentee has developed a method to produce a small quantity of engines at a few highly efficient plants at a cost below the cost of production for existing technology. The market for engines might be as described by Illustration 19:
Absent cartelization, the market would clear at $P_o$, $Q_o$. The patentee could receive royalties equal to the area in triangle I. The patentee’s agreement with the licensees who otherwise would be competitors might, however, include minimum price or allocation provisions which would restrict output and raise price to $P_1$, $Q_1$. Thus, the licensees and patentee would earn monopoly profit; profit in excess of the legitimate rents in triangle I. This is possible because the license agreements have created extra rents—monopoly profit. This monopoly profit equals the area in rectangle II and is not attributable to innovation, but to naked collusion; there is a bigger pie in which each member of the cartel may share. Alternatively, the cartel can accomplish the same result by allowing the patentee to charge royalties equal to the combined area in triangle I and rectangle II, provided that the patentee somehow rebates a portion of those royalties.
Priest suggests that the courts screen for these disguised collusive arrangements by examining the allocation of profit that a patent license arrangement creates. Priest would presume unlawful any arrangement that provides rents for licensees as well as for the patentee. If the arrangement simply exploits the patent, one would expect the patentee to receive all rents. Evidence of shared profits include, inter alia: low royalties (indicating no valuable patent); rebates (indicating royalties serving as minimum price restraints); and a post-innovation increase in market price of a product. This latter indicator is a good one because, using Illustration 19 for an example, nothing but collusion would explain how innovation could increase price from $P_o$ to $P_i$.

2. Concentration of Technology

As good as Priest’s analysis is, it does not deal with the more difficult issue of determining whether license arrangements violate the antitrust laws when those arrangements do nothing more than exploit patented technology’s advantage over unpatented technology. This question is interesting even if the patentees’ sole purpose in combining is to achieve economic rents by restricting output and raising price.¹⁰⁰

Again, Standard Oil is illustrative. Assume that all cracking patents are valid and that the market looks as it did in Illustration 10 as described by Illustration 20:

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99. Price, however, is not always determinative. If demand were increasing, price might rise without collusion. For this and other more detailed analyses, see Priest, supra note 36. Priest works his theory through a number of cases and engages in a more sophisticated analysis than is present in the text.

Priest’s screening theory is similar to Ward Bowman’s patent superiority test. Bowman would presume that an arrangement is unlawful if the arrangement creates monopoly profits in excess of those made possible by a patent’s superiority over alternative technology. W. Bowman, supra note 19, at 54, 63.

100. There are other, less “invidious” purposes for pooling or cross-licensing competitive patents. There are, for example, possible benefits from the grant of immunity from patent infringement suits, possible benefits from efficiency in resolving legal conflicts, and possible benefits from creating an efficient way of licensing a large number of patents. See Andewelt, Analysis of Patent Pools Under the Antitrust Laws, 53 Antitrust L.J. 611, 614-17 (1985); Priest, supra note 36, at 358-64. The discussion in the text is designed to illustrate advantages other than these obviously pro-competitive ones, which of course, favor the conclusions in the text.
Illustration 20

If the competing cracking patents did not combine, the market would clear at $P_0, Q_0$. If the patentees combine the patents and fix the price at $P_1$ through a royalty agreement, then the market would produce only $Q_1$ gallons, $Q_3$ of which distilling would supply.

As we noted in Part I, such combination is not necessarily anticompetitive. If the law forbade this combination, an inventor might not begin the search for an innovative process for fear that someone else would simultaneously invent a similar process that would be competitive, thus eliminating any return on investment in innovation. If this were to occur, cracking technology would be slow to develop, and the economy would face

101. But see supra note 54.
a market for gas that cleared at $P_1$, $Q_1$, the least efficient position in Illustration 20. This is not to say that all cross-licensing of competitive patents should be allowed. Disallowing combination will eliminate only a component of incentive, not all incentive. Some, perhaps much, innovation will occur whether or not combination is lawful, because some inventors will predict their inventions will be first and/or best. Moreover, allowing some but not all combination will create added incentive as compared to a no-combination rule, but will decrease dead weight loss as compared to a free combination rule. The problem, a familiar one, is in striking the balance.  

The law often allows mergers between firms in an industry. This is so despite the ability of merged firms under common ownership and control to

103. Priest downplays the disincentive of prohibiting competitive patent combination relative to the inefficiency created thereby. He states:

Where two firms have invested separately and have simultaneously achieved an identical result, it is plausible that choosing one as superior to the other increases uncertainty and reduces returns to invention. But where one firm has developed a successful process and a second firm, conscious of the success of the first, has reproduced it, uncertainty because of determining priority is absent. More important, two firms investing separately to produce the identical process incur twice the costs of a firm investing alone. Where each firm has invested simultaneously, unaware of the other, this redundancy is explicable and perhaps justifiable. But where a firm has already achieved success, the investment by a second firm solely to reproduce the process in a different form, duplicates the investment of the first and diminishes social welfare.

In the context of a patent, society only benefits from this duplicate expenditure if it causes a fall in the price of the patented good and a reduction in the dead weight loss and monopoly rent. If the two firms are allowed to cross-license their patents and fix royalty, price, or output, this benefit will not be realized. The redundant investment of the second firm is a clear loss. A cross-license in this context unambiguously diminishes welfare.

Priest, supra note 36, at 361-62.

This analysis is somewhat overstated. If the second patentee merely copies the first patent (and somehow gets past the patent office and infringement suits), then there will be little welfare loss because the second patentee will expend few resources. If the second patent attempts a new process that is truly different from the first patentee's, but designed simply to duplicate the first patent's effect, then either the second patentee is a fool or the patent laws offer too much incentive, disregarding any possibility of ex post combination. Neither case is likely to raise serious antitrust problems. Ex ante, the second patentee does not know that he will be able to discover a different process equivalent to the first patentee's. He does know, however, that even if he succeeds, he will have to share the returns on his innovation with the first patentee, about whom the second patentee knows from the start. Thus, the second patentee begins his innovative process with a lower expected return than the first patentee faced at the same stage of innovation; the first patentee could at least hope that his invention would be exclusive.

In addition, there may be advantages to having two processes that accomplish the same end. The processes, for example, may utilize different inputs that could vary in relative cost over time, and, as Edmund Kitch argues, a cross-license agreement between the inventor and the duplicator will reduce socially wasteful investment because the two parties after the agreement will pursue development of patents most efficiently. Kitch, The Nature and Function of the Patent System, 20 J.L. & Econ. 265, 279 (1977).
end by fiat price competition between them. Mergers are permissible because they can have a positive effect on efficiency, either by enabling the exploitation of economies of scale, or by enabling assets to be shifted to the hands of more efficient managers.\textsuperscript{104} There is, however, no per se rule permitting mergers. Under such a rule firms would have an incentive to merge in order to engage in monopoly pricing. Not only would there be much monopoly as a result, but the costs of production might be higher. Firms would sometimes merge into units larger than efficient scale for the industry, for they would be willing to incur diseconomies of large scale production so long as the diseconomies were offset by monopoly profits.\textsuperscript{105}

The antitrust laws balance the effects of mergers. Mergers are permitted so long as they are not between companies so large, relative to the market, that one would presume the monopoly effects of the merger would outweigh the efficiency effects.\textsuperscript{106} The rules that regulate mergers are necessarily inexact, broad balances. As Judges Posner and Easterbrook point out in their antitrust text, "a rule that will distinguish a merger designed to increase efficiency from a merger designed to enable monopoly pricing is difficult to design . . . a merger may do both."\textsuperscript{107}

There are similar difficulties in designing rules to regulate the cross-licensing of competitive patents. Like mergers, cross-licensing creates the potential for economic rents and accompanying dead weight loss. And like mergers, cross-licensing may create efficiencies. In the case of merger, the efficiencies are simultaneous with the merger. In the case of cross-licensing, the efficiencies are inter-generational; the cross-license today provides incentives for innovation tomorrow. Just as we regulate mergers, we should regulate competitive patent cross-licensing by drawing a line reasoned to, on average, separate pro- from anti-competitive arrangements.

The Justice Department, the public body responsible for enforcing the antitrust laws, uses guidelines to draw a distinction between lawful and unlawful mergers. These guidelines may serve as a basis for judicial as well as executive review. Part III of this article discusses the Justice Department's current guidelines on horizontal mergers; it notes that these guidelines may, under certain circumstances, not be appropriately tailored to cross-licensing cases and suggests an alternative approach.

III. MODIFYING THE HERFINDAHL-HIRSCHMAN INDEX TO ACCOUNT FOR CONCENTRATION IN TECHNOLOGY

In deciding whether to challenge a proposed merger as anti-competitive, the Justice Department uses market share and number of competitors as

\textsuperscript{104} R. Posner & F. Easterbrook, \textit{supra} note 19, at 393.

\textsuperscript{105} Id. at 393-94.

\textsuperscript{106} See, \textit{e.g.}, United States v. Columbia Steel Co., 334 U.S. 495 (1948) (Sherman Act not violated by U.S. Steel's acquisition of Consolidated Steel Corporation).

\textsuperscript{107} R. Posner & F. Easterbrook, \textit{supra} note 19, at 394.
proxies for a putative monopolist's market power. As we will see shortly, the Department weighs these factors and sets benchmarks that separate presumptively lawful from presumptively unlawful mergers. Courts could conduct the same analysis.

Perhaps the cross-licensing of competitive patents should be subject to scrutiny in accordance with existing Department guidelines for horizontal mergers. Assume, for example, that two patentees cross-licensed competing patents for the production of an automobile engine. If each patent accounted for the production in a firm in a market that consisted of four manufacturers, each with twenty-five percent of the market, then perhaps the Department and the courts should treat the cross-licensing as a merger between these two firms that together control fifty percent of the market.

Treating a cross-licensing as a merger makes sense if the patentee-firms that cross-license lose their incentive to compete after cross-licensing. This merging of interest occurs directly if the cross-licensing includes profit-sharing among patentees and/or their licensees and may occur indirectly—if increasing output subject to royalties benefits the competition too—even without such profit-sharing. With or without explicit profit-sharing, the cross-licensees may have an incentive to exploit their combined power by reducing output and raising prices; the cross-licensing arrangement provides the facility to do so. Thus, it may well make sense to treat them as merged firms within a market subject to the same cross-licensing agreement. This does not mean, however, that we should use existing merger guidelines to scrutinize cross-licensing.

The current, 1984 Department of Justice Merger Guidelines are designed to deal with typical or average mergers; cross-licensing systematically could differ from the typical merger. The Guidelines for horizontal mergers begin with an explanation of concentration and market share that is useful here:

Market concentration is a function of the number of firms in a market and their respective market shares. Other things being equal, concentration affects the likelihood that one firm, or a small group of firms, could successfully exercise market power. The smaller the percentage of total supply that a firm controls, the more severely it must restrict its own output in order to produce a given price increase, and the less likely it is that an output restriction will be profitable. If collective action is necessary, an additional constraint applies. As the number of firms necessary to control a given percentage of total supply increases, the difficulties and cost of reaching that supply also increase.

As an aid to the interpretation of market data, the Department will use the Herfindahl-Hirschman Index ("HHI") of market concentration. The HHI is calculated by summing the squares of the individual market shares of all firms included in the market...
The HHI reflects both the distribution of the market shares of the top firms and the composition of the market outside the top firms. It also gives proportionately greater weight to the market shares of the larger firms, which probably accords with their relative importance in any collusive interaction. The Department divides the spectrum of the market concentration as measured by the HHI into three regions that can be broadly characterized as unconcentrated (HHI below 1000), moderately concentrated (HHI between 1000 and 1800) and highly concentrated (HHI above 1800). An empirical study by the Department of the size dispersions of the firms within markets indicates that the critical HHI thresholds at 1000 and 1800 correspond roughly to four-firm concentrations ratios of 50 and 70 percent, respectively. Although the resulting regions provide a useful format for merger analysis, the numerical divisions suggest greater precision than is possible with the available economic tools and information. Other things being equal, cases falling just above and just below a threshold present comparable competitive concerns.

\[ 20^2 = 2600 \]. The HHI ranges from 10,000 (in the case of a pure monopoly) to a number approaching zero (in the case of an atomistic market). Although it is desirable to include all firms in the calculation, lack of information about small fringe firms is not critical because such firms do not affect the HHI significantly.

Id. at 26,831 n.14.

109. Id. at 26,831. The Department goes on to explain its general standards for applying HHI:

(a) Post-Merger HHI Below 1000. Markets in this region generally would be considered to be unconcentrated [having the equivalent of at least ten equally sized firms]. Because implicit coordination among firms is likely to be difficult and because the prohibitions of section 1 of the Sherman Act are usually an adequate response to any explicit collusion that might occur, the Department will not challenge mergers falling in this region, except in extraordinary circumstances.

(b) Post-Merger HHI Between 1000 and 1800. Because this region extends from the point at which the competitive concerns associated with concentration become significant to the point at which they become quite serious, generalization is particularly difficult. The Department, however, is unlikely to challenge mergers producing an increase in the HHI of less than 100 points. The Department is more likely to challenge mergers in this region that produce an increase in the HHI of more than 100 points, unless the Department concludes, on the basis of the post-merger HHI, the increase in the HHI, and the presence or absence of the factors discussed [elsewhere in the Guidelines] that the merger is not likely substantially to lessen competition.

(c) Post-Merger HHI Above 1800. Markets in this region generally are considered to be highly concentrated [having the equivalent of no more than approximately six equally sized firms]. Additional concentration resulting from mergers is a matter of significant competitive concern [and the Department will resolve close questions in favor of challenging the merger]. The Department is unlikely, however, to challenge mergers producing an increase in the HHI of less than 50 points. The Department is likely to challenge mergers in this region that produce an increase in the HHI of more than 50 points, unless the Department concludes, on the basis of the post-merger HHI, the increase in the HHI, and the presence or absence of the factors discussed [elsewhere in the Guidelines] that the merger is not likely substantially to lessen competition. However, if the increase in the HHI exceeds 100 and the post-merger HHI substantially exceeds 1800, only in extraordinary cases will such factors establish that the merger is not likely substantially to lessen competition.

Id. § 3.11, at 26,831.
Neither the Department nor the courts should automatically use the Department's current HHI benchmarks to analyze the effective merger of firms pursuant to the combination of competitive patents where the patents are for production processes that exist in an industry that uses patented as well as unpatented technology. This becomes apparent when one examines the assumptions that underlie the HHI.

The Guidelines first must make certain assumptions about market elasticity of demand. The Guidelines state that "the smaller the percentage of total supply that a firm controls, the more severely it must restrict its own output in order to produce a given price increase, and the less likely it is that an output restriction will be profitable." This, however, tells us only that low HHI mergers are relatively less threatening to competition than are high HHI mergers. In order to set HHI thresholds, the Department must have gone beyond this theoretical presumption and used empirical data to make judgments in absolute terms.

To illustrate, assume that the Department considered a potential merger of four firms in an industry comprised of twenty firms of equal size. The Guidelines tell us that the Department probably would not challenge such a merger even if it increased the HHI from 500 to 800—a final HHI of 800 is within the Guidelines' virtual safe harbor. In drafting guidelines that permit such a merger, the Department must have assumed that the typical short-term supply curve in the industry described is similar to that described by Illustration 21:

\[ S \]

\[ P_0 \]

\[ O \]

\[ Q_0 \]

\[ Q \]

Illustration 21

110. *Id.* § 3.1, at 26,830.
111. *Id.* § 3.11, at 28,831.
Given this supply curve as a basis for an industry in pre-merger equilibrium at \( P_o, Q_o \), the presence of a post-merger firm with a twenty percent share is not likely to pose a threat to competition. With seventeen firms in the industry, collusion is unlikely. And with sixteen competitors supplying eighty percent of market output, the merged firm will be unable to cut back output enough to affect price. Even assuming a vertical demand curve at \( Q_o \), the merged firm’s cutback will induce a price increase limited by the marginal cost to the other firms of replacing the merged firm’s reduction in output. The shape of \( S \) at \( Q_o \) indicates that a cutback necessarily limited by the size of the merged firm, here twenty percent of the market, ordinarily could not induce a significant increase in price that would remain approximately \( P_o \). The short-term industry supply curve, \( S \), is the horizontal summation of each firm’s marginal cost curve. The flat portion of \( S \) at \( Q_o \) indicates that there are some firms either currently in the industry, or at the edge of entry, that can produce additional output at only a small increase above \( P_o \). Thus the merged firm’s limited cutback could not significantly increase price unless the merged firm represented all of the potential supply above \( Q_o \) at approximately \( P_o \).

This hypothetical merger, one that would likely go unchallenged under the Guidelines, truly presents no threat to competition only when the industry supply curve includes fringe firms that can offset a merged firm cutback in output by increasing production at approximately the pre-merger equilibrium price. Here is the first potential difference between the typical merger and patent cross-licensing—the combination of competitive patents systematically may violate this condition more often than will a typical merger. To illustrate, consider the following individual subindustry marginal cost curves:

\[
\text{Illustration 22}
\]

An ordinary industry supply curve might include the marginal cost curves of firms that describe Illustration 22(a) and firms that describe Illustration 22(b); not all firms in an industry share a common marginal cost function.

The "subindustries" described here reflect a hypothetical division between firms and potential firms that easily can expand output at \( P_0 \) and those that cannot. A typical merger will no more likely involve a firm from one subindustry than from the other. Thus, if there are many firms from each that comprise a market in equilibrium at \( P_0 \), a merger of small firms probably will leave in the fringe a number of firms described by Illustration 22(a). Such firms restrain the monopoly power of the merged firm because, for small changes, these firms can increase output at a price of approximately \( P_0 \). This explains the flat portion of \( S \) at \( Q_0 \) in Illustration 21. If, however, the merged firms combined all firms in the industry described by Illustration 22(a), then the only firms remaining in the fringe would be firms described by Illustration 22(b). As a result, the effective restraint in the industry supply curve, based on the remaining post-merger competition, at least in the short run, would be a steep portion comprised of firms described by Illustration 22(b).

The latter situation is one that may be common in competitive patent combinations. In these cases, publicly licensed technological advantages serve to differentiate more efficient from less efficient firms. Thus, collusion and concentration of advantage become more likely than in the typical merger case. To illustrate, recall that in our prior discussion of Standard Oil, we posited the possibility that cracking patent technology allowed a horizontal supply curve for quantities well in excess of the equilibrium quantity in a market where production is mixed between distilling and cracking. An almost horizontal supply curve, even in the short run, is reasonably possible if the cracking technology does not quickly exhaust the capacity of individual firms; that is, cracking technology may be a highly efficient production technique over a broad range of output. Each cracking firm's marginal cost curve might look like the ones that make up Illustration 22(a). This could represent an improvement in efficiency over distilling firms conforming to Illustration 22(b).

A merger among firms randomly chosen in the gasoline industry, or to state a common reason for mergers, a merger between firms that together are more efficient than the separate firms, would likely leave some cracking firms in the fringe, and the merged firm would likely have little monopoly power. There is no reason to believe that post-merger efficiencies relative to pre-merger are any more or less likely to benefit distilling firms as they are to benefit cracking firms. If, however, as was the case in Standard Oil, the merged firm is uninterested in relative efficiencies, but instead systematically

113. See supra note 98 and accompanying text.
includes most of the cracking technology, which, at competitive equilibrium
is more efficient than distilling independent of the merger, then the fringe
firm supply curve will likely slope upward, reflecting the marginal cost curves
of the less efficient distilling firms. Illustration 22(b) represents this situation.
Therefore, the fringe firms would, for some level of output, offer little
restraint on the merged firm's ability to raise price.

Patented processes that could be competitive are valuable when combined
precisely because they are more efficient than existing technologies. The
profit is in monopolizing the most efficient production facilities. Patents
identify for the world efficient production techniques, and this allows po-
tential competitors easily to find one another and to join together. Thus,
the pattern of inelastic fringe supply may be a part of competitive patent
combinations. The Department HHI benchmarks do not assume combination
of the most efficient firms and may therefore, underestimate the threat to
competition that competitive patent combination poses.

The effect just described is to some extent a short-term effect. The
combination of the most efficient firms in an industry will give the merged
firm long-term power only if new firms cannot enter and join the fringe
firms at pre-merger levels of production and at a production price near the
pre-merger equilibrium. Assuming as we have that the patented production
processes do not completely replace prior technology, there may be few
barriers to entry for firms using the prior technology. Thus, in the long run
in a constant-cost industry, entry should somewhat erode a merged firm's
power. This erosion, however, will not be complete. Long-term supply curves
may be upward-sloping because each firm that would enter an industry
would be less efficient than the previous firm. Only a higher product price
will draw a less efficient firm. This is the case on the whole, even though
some less efficient firms will be able to change their attributes over time.

Moreover, in the case of competitive patent combination, it may be
common that little if any long-term erosion will occur until the expiration
of the patents involved. We would expect this lack of erosion if patented
processes compete with non-patented processes that constitute an exhausted
cost-increasing subindustry. Technologies become highly costly or exhausted
when individual user firms' cost curves shift upward with increased total
production. Given a fixed technological process, increasing industry-wide
demand for inputs gives rise to these cost shifts. As production inputs become
more and more scarce, each firm faces higher and higher input costs that
are driven up by total producer demand. At high levels of industry-wide
output, each firm in an industry can supply an extra unit of output only at
a price well above the price at which that firm could have produced if it
alone increased output within lower industry-wide production. Given these
conditions, industry cost increases with output regardless of the efficiency
of the constituent firms. Entry would not flatten the industry supply curve
until the perfection of new competing technologies that use different inputs.¹¹⁴

¹¹⁴. See M. Brennan, supra note 112.
Industries at equilibrium with exhausted technologies are, therefore, ripe for an innovation that would allow production using fewer or different inputs. Innovation may replace prior technology, or innovation may replace only a portion of production using prior technology that may be more efficient than the innovation over certain ranges of output. Even in the latter case, where innovation occurs in such an industry, an entity with an exclusive right in the innovation will face relatively little restraint in the market compared to a typical firm of similar size. Where there is an exclusive right in the marginally most efficient technology, we would expect to see fringe supply curves that rise sharply, reflecting the fringe's need to make greater and greater use of depleted resources. Moreover, once established, the innovator's cutback in production will not shift the fringe supply curve downward. By hypothesis, the innovator's process is valuable in part because it does not rely on resources made scarce by competing technology. The innovator's cutback, therefore, will not free up resources as would a cutback by a putative monopolist participating in the exhausted technology.

In addition, where new technology has replaced old at high levels of industry output, we would expect few firms prepared to enter quickly using the old, apparently exhausted and, as a result, archaic technology. Thus, an innovator's cutback that follows a period of competition among "modern" technologies will, over some time, force each existing old-technology firm to operate on a steep-sloped portion of its marginal cost curve.

In any case, the prospect of long-term erosion does not excuse short-term monopoly. In the long run, we all die, and most monopolies abate; nevertheless, a short-term loss due to monopoly is real and properly subject to antitrust law. We see, then, that a merger that could effect an exclusive combination of an innovative technological process may be systematically more likely than the average merger to face only weak restrictions on its power to raise prices. Even small declines in a technological monopolist's output can create price increases that might go unchallenged under the Justice Department Guidelines. The Justice Department should, therefore, take account of this potential difference between the average competitive patent cross-licensing or merger and

115. Of course, the innovator's initial entry into the market will slightly shift downward the fringe's supply curve because fringe technology production will be less post-innovation than pre-innovation.

116. The current guidelines suggest a two-year time period for considering monopoly effects. Department of Justice Merger Guidelines, supra note 108, § 3.3, at 26,832.

117. This conclusion does not contradict Roger Andewelt's conclusion that the market share of fringe firms may underestimate the fringe's elasticity of supply. See Andewelt, supra note 100, at 624-25. Andewelt's analysis proceeds from the assumption that the putative monopolist will attempt to monopolize the sale of licenses in competing technologies. The analysis in the text assumes such a monopoly and examines the effect on product markets.
the average intra-industry merger. The result of assessing this difference, however, is ambiguous.

The current Guidelines do go beyond HHI analysis and attempt to deal with the problems of fringe supply elasticity. Section 3.43\textsuperscript{118} states that "the Department is less likely to challenge a merger if small or fringe firms currently are able to expand significantly their sales at incremental costs that are approximately equal to their incremental costs experienced at current levels of output." And section 3.21\textsuperscript{119} notes that "recent or on-going changes in the market [such as technological changes] may indicate that the current market share of a particular firm either understates or overstates the firm's future competitive significance."

These comments, however, are not necessarily useful in scrutinizing patent cross-licensing. Sections 3.43 and 3.21 are consistent with the foregoing analysis and observation that, all else being equal, competitive patent cross-licensing may pose a greater threat to competition than does the typical merger. But that analysis does not necessarily imply that such cross-licensing arrangements should be subject to harsher treatment than the Department would give to a typical merger of similar size in a similar market. While cross-licensing may create more market power than will a typical merger, this additional power may be beneficial. Remember, permitting any competitive patent cross-licensing enhances incentive to innovate because the cross-licensing allows some rents resulting from the ability to reduce output and increase price. If the HHI benchmarks in the current Guidelines are designed to prevent virtually all monopoly power from merger, then the strictness of the Guidelines may be inappropriate for patent combinations. With regard to these combinations, therefore, the Guidelines' possibly strict HHI benchmarks may offset their possibly inapposite inherent assumptions about the relationship between market share and market power.

Put another way, the Guidelines' HHI analysis may by design allow too little economic power to provide useful incentive for patent cross-licensing, but may at the same time allow patent cross-licensing to slip through the cracks, thus restoring incentive. As a result, perhaps the Department should use current HHI benchmarks to scrutinize patent cross-licensing without regard to the special limitations of sections 3.43 and 3.21. Indeed, perhaps current HHI benchmarks should be made more lenient with regard to patent licensing. Whether either of these solutions is in fact appropriate would depend on empirical analysis.

Examining and perhaps altering HHI benchmarks for competitive patent cross-licensing cases are useful and necessary steps. But these steps are not sufficient; the system itself must change. For the reasons discussed above, and because patent strength may vary widely from case to case, no system of HHI benchmarks that treats fringe supply as a function of fringe size

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\textsuperscript{118} Department of Justice Merger Guidelines, supra note 108, § 3.43, at 26,833.
\textsuperscript{119} Id. § 3.21, at 26,831.
adequately can address competitive patent combination. A sensitive
guide would take into account the patents' advantage over competing tech-
nologies. If the Department wishes to fine-tune its scrutiny by considering
factors such as those mentioned in sections 3.43 and 3.21, it should offer
more guidance than these rather obscure sections offer. The Department
could offer more guidance by making explicit its fringe firm supply assump-
tions for various HHI results. The Department could accomplish this by
using the following equations, which, though still subject to certain as-
sumptions that may not be applicable, under certain circumstances, provide
a more accurate measure of market power than does HHI analysis:

\[
P_m/P_c = \frac{ed}{ed - 1}, \text{ where } ed = \frac{ed(mkt.) + es(1 - S)}{S}
\]

\(P_m/P_c\) is monopoly price divided by competitive price and is the measure
of an alleged monopolist's market power. The symbol \(ed\) is the elasticity of
demand facing the firm alleged to have market power; \(S\) is the firm's market
share; \(ed(mkt.)\) is the elasticity of demand that faces the market consisting
of the firm in question and its competitors; and \(es\) is the elasticity of supply
of the firm's competitors.\(^{120}\)

The elegance of these formulas is quickly apparent. Assume \(es=0\); \(ed\)
would equal \(ed(mkt.)/S\). This correctly indicates that the firm would face
constraint only from the market demand curve and the firm's relative size,
not from competition. Assume instead that firms merge in an atomized in-
dustry where \(es\) is approximately infinite; there, \(ed(mkt.) + es(1 - S)/S\)
would approach infinity; \(ed/(ed - 1)\) would approach 1, which correctly in-
dicates no market power.\(^{121}\) In sum, these market power equations take ac-
count of a number of factors, each of which is necessary to predict market
power accurately. Market share alone is not sufficient.

The Department Guidelines employ HHI analysis instead of this market
power formula probably because it is difficult to measure \(ed(mkt.)\) and \(es\).HHI allows the Department to proceed after calculating only \(S\) for each
firm in an industry. But it would not be difficult for the Department to use
the market power equation in conjunction with its HHI analysis. The De-
partment easily could assume a series of market characteristics, including \(ed\)
(mkt.) and \(es\), for any HHI result. Having done this, the Department could
issue new guidelines listing HHI results, the assumed \(ed(mkt.)\), \(es\), \(S\) and
resulting in \(P_m/P_c\) for each result, or at HHI increments. The new guidelines
could then issue benchmarks for scrutiny similar to those that exist in the
current Guidelines. These benchmarks could take into account the possible

\(^{120}\) For a further explanation of these equations, their underlying assumptions, and their
source, see R. POSNER & F. EASTERBROOK, supra note 19, at 347-54.

\(^{121}\) Id.
differences in benefit, discussed above, in a cross-licensing as compared to a typical merger and would account for specific fringe supply elasticity. At whatever levels set, the benchmarks would include a useful market power quotient. Guidelines could, for example, indicate that a benchmark post-merger HHI of 1000 corresponds to a market in which a merged firm supplies ten percent of the market. Guidelines so structured would be an aid to some competitive patentees who desire to merge or cross-license. Patentees who could estimate their market power could also estimate the probability that the combination would ultimately be deemed unlawful.

Of course, as noted, the problem with the market power equation in the first place is its practical difficulty. the new guidelines would be useful in several ways. First, these suggestions arise only after we assume that the current Guidelines do not adequately address certain combinations; a difficult solution is better than none at all. Second, the Department could make these suggested guidelines substantially less difficult to use than the market power equation itself. Recall that it is elasticity of fringe supply that systematically may differ for patent combinations compared to the average merger; nothing we have seen alters current guideline assumptions about elasticity of market demand. Thus, the suggested guidelines could include a constant $e^\text{d (mkt.)}$ that the Department, patentees, and the courts could take as given. This could focus everyone's attention on a single indicator: $e^\text{d}$.

If $e^\text{d}$ is too difficult or too expensive to calculate, the Department could establish a proxy for $e^\text{d}$ based on the combined patentees' internal marginal cost advantages of using the combined technology as compared to using technology available to other firms. It should be easier to estimate individual firm marginal cost than it would be to estimate industry supply. The formula for calculating proxies would depend on empirically based assumptions, that are, perhaps, difficult to determine. But once the proxies were in place, though inexact, they would contribute to the advantage of certainty in the law, which, after all, is a principal purpose of any guideline.

There is another reason the guidelines suggested here would not necessarily be too expensive to use. Their use could be narrowly applied. Assume, for example, as was true in *Hartford-Empire Co. v. United States*, that patented production comprised ninety-four percent of all production in the glass industry, and that all patents were cross-licensed among competitors via a patent pool holding company. Such an arrangement would be subject to challenge under a simple HHI analysis, even one geared to take account of possible special incentive benefits of cross-licensing. It would be almost impossible to show an $e^\text{d}$ high enough to justify the combination. There would, therefore, be no need to calculate $e^\text{d}$ or a proxy therefor.

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There would, in addition, be no need to invoke the suggested guidelines if a competitive patent combination did not threaten competition even among possessors of similar technology. Where a combined concern has no power even absent the restraint of an alternative technology, the existence of that alternative technology becomes irrelevant. Once again, there would be no need to calculate $e^t$ or a proxy therefor; current HHI analysis can determine lack of concentration within a technology.\footnote{124. But see supra note 116.}

The suggested guidelines would be important where monopolized patented processes compete with, but do not replace, alternative marginally less efficient technologies. This can occur whenever an innovation allows a relatively flat production supply curve that intersects with a steeper alternative technology supply curve—as seen in the discussion of Standard Oil.\footnote{125. See supra notes 49-54 and notes 97-100 and accompanying text.} Current guidelines may not estimate accurately the anti-competitive effect when patented technologies combine in such markets. The guidelines suggested here would allow more accurate estimation and would serve to permit some combination, but not at any cost.

**Conclusion**

Many techniques that patentees employ to exploit their patents are condemned by antitrust law despite the fact that the techniques are, on balance, beneficial to the economy. The Supreme Court’s rule of reason analysis in *Broadcast Music* has opened the door for courts to vindicate these wrongly prohibited practices. Many practices should be exempt from scrutiny. Others, most notably the horizontal combination of competitive patents, should be subject to scrutiny.

The Justice Department and the courts should treat competitive patent combinations much in the same way that the current Department Guidelines treat horizontal mergers. The Department should, however, reexamine these Guidelines in order to take into account the systematic reduction in elasticity of fringe firm supply following a patent combination compared to that following a typical merger, and the possible differences in the benefits to cross-licensing as compared to benefits in the typical merger.