

HOW PATENT DAMAGES SKEW LICENSING MARKETS

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ABSTRACT—*If a litigated patent has previously been licensed to a third party, the courts generally adopt the terms of the prior agreement as the best measure of damages. However, while administratively convenient, this “licensing-based damages” standard creates problematic incentives and undermines the efficient commercialization of patented inventions. It rests on the trivialized (and generally false) presumption that a patent license is like a commodity, with the patentee charging a common price to all comers. As a consequence, patentees distort their future recovery prospects—and, by extension, the outcomes of future licensing negotiations—whenever they license their patents, whether or not today’s agreement will be a good proxy for tomorrow’s dealings or disputes. Knowing this, patentees are discouraged from licensing at anything less than a high royalty rate, even if they could reach many additional mutually beneficial agreements on more modest terms. The result is that patent holders rationally cut off the bottom segment of the licensing market, creating substantial deadweight loss. This injures not only patentees but also prospective licensees and their consumers. The standard creates additional problems by encouraging secrecy and gamesmanship in patent licensing.*

We propose that the licensing-based damages standard be abandoned and that damages generally be awarded ad hoc. This does not mean that private parties should ignore comparable licenses in their private dealings; it simply means that courts should not use them as a measure of damages. That this necessitates some speculation does not suggest it is the less desirable approach, for it is better that damages be somewhat random than systematically harmful. Further, while the licensing-based damages standard is easy to apply, there is little reason to believe it is accurate in the typical case. As such, its apparent lack of randomness does not suggest that it is producing good results.

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I. INTRODUCTION

As a first principle, the role of patent damages is to compensate patentees for past or future infringement. But this simplistic characterization provides little guidance for constructing effective remedial *standards*. The truth is that patent remedies are far less consequential within the courtroom than outside of it. Private dealings vastly outnumber litigated disputes,¹ but they all occur in the proverbial “shadow of litigation.” Incentives to invent are similarly colored by expectations about the remedies that support patent enforcement. And these expectations are formed by observing the calculus with which the courts compute damages. Thus, as a policy issue, what matters most is not the number of dollars awarded in a particular case, but rather the legal standard used to choose that amount. Such standards have a substantial impact on the private exchange of patent rights and should therefore be viewed as an important policy lever for encouraging the efficient dissemination and commercialization of patented technologies.

This article addresses a particularly problematic standard for computing patent damages—which we call “licensing-based damages.” Under this standard,

¹ See, e.g., Mark A. Lemley & Carl Shapiro, *Probabilistic Patents*, J. ECON. PERSPECTIVES, Spring 2005, at 75, 75 (noting that less than 1.5% of patents are ever litigated, and only .1% ever reach trial).

damages are based on the monetary terms of prior licensing agreements involving the litigated patent. We are particularly interested in damages awards based on prior agreements in which the present plaintiff licensed the now-disputed patent. The licensing-based damages standard is perhaps best known as the first of the fifteen *Georgia-Pacific* factors,² which provide guidance for computing patent damages consisting in a “reasonable royalty.”³ However, its use dates back as far as the late nineteenth century.⁴

Today, licensing-based damages are commonly used in disputes involving patents that have been licensed in the past.⁵ The courts tend to view this standard as not only convenient, but also accurate. For instance, the Federal Circuit has remarked that, “[w]here an established royalty rate for the patented invention is shown to exist, that rate will usually be adopted as the best measure of reasonable and entire compensation.”⁶ In the courts’ view, the royalty rate from a prior agreement is a strong indicator of what the defendant in suit would have paid for the same rights. Indeed, it is thought to “remove[] the need to guess at the terms to which the parties would hypothetically agree.”⁷ The implication is that the defendant would have paid the same amount as the prior licensee, notwithstanding that the litigants reached no such agreement on their own.

The problem with licensing-based damages is that they tether patentees to the terms of their prior dealings, and this distorts both litigation outcomes and licensing behavior in a number of harmful ways. Perhaps the most serious problem is that it undermines efficient patent licensing and hence prevents patented inventions from being efficiently disseminated and commercialized.⁸ When a patentee licenses its patent, this standard forces it to hedge against the possible future consequences of the present agreement on its future dealings and disputes. This discourages patent holders from licensing at anything less than a high royalty rate—even if additional

² *Georgia-Pacific Corp. v. United States Plywood Corp.*, 318 F. Supp. 1116, 1120 (S.D.N.Y. 1970), *mod. and aff'd*, 446 F.2d 295 (2d Cir. 1971) (listing “[t]he royalties received by [the plaintiff] for the licensing of the patent in suit, proving or tending to prove an established royalty” as the first of fifteen factors for computing reasonable royalties).

³ 35 U.S.C. § 284 (2011) (“[T]he court shall award the claimant damages adequate to compensate for the infringement, but in no event less than a reasonable royalty.”). The most common interpretation of the reasonable royalty is that it equals what the parties would have agreed to in a counterfactual arm’s length licensing negotiation. *E.g.*, Mark Lemley, *Distinguishing Lost Profits from Reasonable Royalties*, 51 WM. & MARY L. REV. 655, 661 (2009).

⁴ *See, e.g.*, *Clark v. Wooster*, 119 U.S. 322, 326 (1886) (“It is a general rule in patent causes that established license fees are the best measure of damages that can be used.”).

⁵ *See* Jonathan S. Masur, *The Use and Misuse of Patent Damages*, 110 NW. U. L. REV. 115, 120 (2015) (“Courts have relied upon existing licenses in calculating damages for decades, and the practice has grown even more prominent in recent years.”).

⁶ *Tektronix, Inc. v. United States*, 552 F.2d 343, 347 (Ct. Cl. 1977).

⁷ *Monsanto Co. v. McFarling*, 488 F.3d 973, 979 (Fed. Cir. 2007).

⁸ For the related proposition that this damages standard is unlikely to provide an accurate measure of harm, see Masur, *supra* note 5, at 120 (“[T]here is doubt as to whether existing licenses can provide reliable evidence of reasonable royalty damages.”).

mutually beneficial agreements could be reached at lower rates—due to the fear that anything less would weaken its patent by limiting its future recovery.

This is in stark contrast to the way agreements are normally formed. Ideally, both parties to a deal would view their transaction as an isolated event that will not bind them in future dealings or disputes with third parties. This is the logic that underpins the privity of contract doctrine. But the licensing-based damages rule makes this impossible. For example, suppose a patentee would like to license to some “fringe competitors,” which present only a nominal commercial threat, but not to its primary rival. Licensing is virtually always welfare-enhancing, so this outcome would be efficient. But the licensing-based damages standard may prevent it from happening and may instead lead the patentee to refuse to license to *anyone*. Indeed, an agreement with a fringe competitor would create a false inference that the patentee would have willingly licensed to its primary rival at the same rate. This may be an unacceptable risk, leading the patent holder to rationally (albeit reluctantly) refuse to license with anyone.

The patentee is concerned not only with adversely impacting its future litigation prospects, but also with the fees it can earn in future licensing. If the patent holder were to license at a modest royalty rate, the resulting limitation on future recovery provides a bargaining chip with which future licensees may secure lower fees than they would otherwise pay. Thus, because patent holders are concerned with keeping their patents as strong as possible, they will be reluctant to strike any licensing deals that might undermine the perceived value of their patents.

One inherent problem with the licensing-based damages standard is that it reflects a trivialized view of patent rights as commercial objects. It treats them like commodities, such as grain or lumber, that are always sold to everyone at a common price. But in fact there are many variables that would tend to create a disparity in the licensing terms reached in different agreements. Section II provides a comprehensive list of such factors. For example, many patented inventions can be applied in a number of different ways or within different kinds of products, which vary in their commercial value. Alternatively, the royalty rate in a licensing agreement may reflect factors that have nothing to do with patent value. For example, a high royalty rate may be used essentially as a financing device, allowing a pre-revenue licensee to avoid paying a large lump sum and instead pay as she goes.

Due to the many variables that influence the terms of licensing agreements, price discrimination—charging different royalty rates to different licensees—becomes an essential condition for efficiency in patent licensing markets. If patent holders feel obligated to stick to a fixed price for all licensees, then they may forgo many mutually beneficial deals that could only be reached on more modest terms. That is to say, rigid pricing will produce deadweight loss, which is a well-understood problem in economics. Thus, ideally patent holders would feel free to price discriminate—to charge low royalties to low-value licensees and high

royalties to high-value licensees. Furthermore, unlike many consumer products, the value of a patent license is usually high in relation to the relevant transaction costs, making it generally feasible for a patentee to price discriminate through ad hoc negotiations with different licensees. But the licensing-based damages standard discourages them from doing this. It induces them to strike only the most lucrative licensing deals and thereby keep the royalty rate high, even if additional valuable deals could be reached at lower rates.

The problems with licensing-based damages extend beyond the disincentive they create for price discrimination. If licenses can reduce the amount of damages a patent owner will receive at trial—and thus reduce the amount of future licenses as well—patent owners have incentives to conceal or obscure the licensing deals they have struck. They might couple licenses with other goods such as trademarks or trade secrets that the licensee does not really want or need in an attempt to render the licenses less useful to courts as guides to damages. Or they might simply attempt to conceal the license using confidentiality agreements and prevent it from ever reaching the public. These tactics, whichever form they take, will likely increase transaction costs, make settlements less likely, and obscure information that could function as a public good. Courts' misuse of licensing-based damages can thus do violence to the IP-licensing ecosystem.

In light of the foregoing conclusions, we propose that the licensing-based damages standard be abandoned and that courts instead award damages ad hoc, on the basis of the value of the technology to the infringer.⁹ This does not mean that comparable licenses should not have any influence on the parties. On the contrary, assessments of comparable licenses are quite helpful in private licensing negotiations, and they should be considered in this context. What we suggest, by contrast, is that the courts should not rely on the terms of a prior licensing deal as a measure of the plaintiff's damages. That standard treats any licensing agreement as an implicit commitment by the patentee to accept the stipulated royalty rate as the measure of damages in all future disputes, and this systematically distorts private behavior in licensing markets.

In principle, there may be some situations in which the licensing-based damages standard is appropriate, or at least less harmful. This may be so if the patentee has widely licensed the infringed patent on nondiscriminatory terms.¹⁰ However, as we will show, the standard is still likely to produce an inapt measure of damages in this situation, at least if there was pre-judgment uncertainty as to whether the plaintiff would prevail in court. The prior royalty rate, while stable over time, reflected uncertainty as to whether the plaintiff would win. If the court applies this royalty

⁹ See David O. Taylor, *Using Reasonable Royalties to Value Patented Technology*, 49 GA. L. REV. 79 (2014) (advocating this type of approach).

¹⁰ In particular, this may be so if the patent is very widely licensed at a common rate. For example, some patentees make a commitment to license their patents on reasonable and nondiscriminatory (RAND) terms. These commitments are often applied to patents that are essential to an adopted technology standard, in which case they will be licensed by most or all firms who products read on the standard. See *infra* note 20.

rate as-is, it implicitly discounts the patentee's recovery to reflect that uncertainty, notwithstanding that it has just eliminated all uncertainty by holding the patent valid and infringed. We show that this will lead to systematic under-compensation over time, assuming that ad hoc damages (expectations of which determine the terms in the first agreement) are accurate in expected value.

The arguments in the prior paragraph also explain why it is not enough to demand that courts be more careful to ensure that the relied-upon agreements are sufficiently "comparable." Even if the commercial circumstances are largely equivalent, the fact that the prior agreements were reached under uncertainty suggests that they are generally an inaccurate measure of damages. More generally, damages should not be based on economic data that have been distorted by the parties' expectations about what damages will be. Doing so creates a circularity problem that biases damages downward and undermines efficiency in licensing markets.

Econometrics has a term for the bias created by this kind of circularity problem: endogeneity.¹¹ In effect, endogeneity means that that the modeler—or, in our case, the courts—is relying on a mistaken conception of how some causal relationship actually works. When the courts apply the licensing-based damages standard, the endogeneity problem is the following: the court believes that economic factors alone are shaping licensing terms, and that only these terms are in turn shaping future damages awards. The court thus presumes that economic factors alone are shaping its damages awards. But in fact the licensing-based damages standard has a causal effect on future licensing terms, and this effect is not related to any economic factors relevant to the agreement in question. This, by extension, means that licensing terms are not actually a good measure of damages because they are distorted by the courts' remedial standards. An ironic corollary is that licensing terms are actually less reliable as a proxy for harm than they would be if the licensing-based damages standard did not exist. If courts persist in using this inaccurate measure, patent owners will respond by reducing the number of licenses they grant.

This Article proceeds in four additional Parts. In Part II, we describe the operation of a healthy patent licensing market. In Part III, we explain how courts' use of licensing-based damages can lead to artificial reductions in the damages awarded at trial, and thus to artificial reductions in future licensing revenue as well. In Part IV, which is the heart of the paper, we describe the effects of these distortions on the licensing market. We explain that patent owners will be less inclined to price discriminate, that they will attempt to bundle patent licenses with unnecessary other goods in order to render licenses less transparent, and that in

¹¹ Kevin D. Hoover, *Causality in Economics and Econometrics*, THE NEW PALGRAVE DICTIONARY OF ECONOMICS ONLINE (Steven N. Durlauf and Lawrence E. Blume eds., 2d Ed. 2008), http://www.dictionaryofeconomics.com/article?id=pde2008_C000569 (providing an overview of endogeneity and causality in economic analysis).

many cases they will simply hide licenses behind confidentiality agreements. Part V concludes with some tentative policy recommendations.

II. PATENT LICENSING MARKETS

For every patent, there is a potential licensing market in which the patent holder may sell the rights to make, use, or sell technologies covered by the patent. As with any other market, we would like a licensing market to operate efficiently, meaning that no possible mutually beneficial transactions are foregone.¹² In addition to benefitting both licensing parties, these transactions create a positive externality in the form of enhanced consumer welfare in the licensee's product market. Indeed, a licensee desires a license precisely because it will allow it to offer a new, improved, or less expensive product to its consumers. This in turn permits it to capture additional profits while also improving consumer welfare. And of course a patentee benefits from mutually beneficial licensing by definition, so a healthy licensing market only strengthens the incentive to invent. Thus, by encouraging both the development and the dissemination of new inventions, an efficient licensing market allows society to have its cake and eat it too.

Although the principal ambition of the patent system is to promote innovation, it clearly has a secondary interest in encouraging the dissemination and commercialization of patented inventions through efficient patent licensing. Because all patent licensing occurs in the shadow of litigation, patent remedies play a prominent role in shaping licensing behavior. Most patentees will never actually receive a remedy (because most patents are never litigated),¹³ but beliefs about patent remedies influence virtually all patent licensing. Thus, expectations about damages do a great deal of work, and these expectations are formed principally by the general rules that courts use to calculate damages.¹⁴ For a licensing market to achieve efficiency, these rules must shape incentives in such a way that patent holders are not discouraged from licensing.

Many patents could be licensed on mutually beneficial terms to at least *some* prospective user.¹⁵ This is particularly likely when technologies are complex and can be applied in a number of different kinds of products. For example, mutually

¹² Mutually beneficial licensing is possible when a potential licensee values the use of the patented invention more than the patent holder values the exclusion of the licensee's use.

¹³ Lemley & Shapiro, *supra* note 1, at 75.

¹⁴ The only circumstance in which expectations about damages are irrelevant is when there are no damages to award for past conduct and both parties believe with 100% certainty that the court will grant an injunction if the patent owner prevails at trial. Not surprisingly, we suspect that this circumstance arises only very rarely, if ever, in situations where licensing might be mutually-beneficial.

¹⁵ Here, and throughout this paper, we focus on patents with legitimate commercial value. However, there are many patents that do not have commercial value, in which case there are no prospective users willing to pay for a license. *See, e.g.*, THOMAS F. COTTER, *COMPARATIVE PATENT REMEDIES* 46 (2013) ("Many patents have little or no commercial value. . .").

beneficial licensing is always possible if the patented technology can be usefully applied by firms that do not compete with the patent holder. The extreme case, which is now quite common, arises when the patent holder is a non-practicing entity that sells no products and thus does not compete with anyone.¹⁶

Even if a prospective user is a competitor, however, licensing may benefit the competitor more than it hurts the patent holder. In such a case, the parties can still reach a mutually beneficial deal, notwithstanding that it provides a boost to the patentee's rival. For example, if the parties' products are sufficiently differentiated, then competition will not be too fierce, in which case the patentee may not face serious injury by selling a license. Another obvious explanation is the availability of non-infringing alternative technologies. If a rival licensee has a viable alternative option, then licensing may be in the patentee's best interest, even if its first choice would be to exclude the licensee from the market altogether. After all, the alternative technology might impact competition in substantially the same way, but it would not entitle the patentee to collect licensing fees.¹⁷ As this analysis demonstrates, mutually beneficial licensing is legitimately impossible only if (1) all possible licensing applications would substantially increase the degree of competition faced by the patent holder, and (2) prospective licensees do not have reasonably viable alternatives to the patented technology.¹⁸

At the time a patent is granted, the patent holder is the only party with the right to use the patented invention. To the extent that mutually beneficial licensing is possible, this initial allocation of patent rights is inefficient. Ronald Coase famously pointed out the significance of the initial allocation of property rights in markets where, for one reason or another, the relevant parties may not be able to transact efficiently.¹⁹ He noted that

the initial delimitation of legal rights does have an effect on the efficiency with which the economic system operates. One arrangement of rights may bring about a greater value of production than any other. But unless this is the arrangement of rights established by the legal system, the costs of reaching the same result by altering and combining rights through the market may be so great that this optimal arrangement of rights . . . may never be achieved.²⁰

¹⁶ A non-practicing entity is a firm that owns and enforces patents, but does not actually manufacture any products that rely on them. *E.g.*, Mark A. Lemley & A. Douglass Melamed, *Missing the Forest for the Trolls*, 113 COLUM. L. REV. 2117, 2118 (2013).

¹⁷ A similar possibility arises if the prospective licensee has a reasonably strong argument that the patent is invalid, in which case the alternative to licensing might be litigation resulting in the patent's invalidation. Here too licensing to a rival may be preferable to the alternative.

¹⁸ This is most likely to occur in situations where the patented technology essentially constitutes the final product all by itself, such as a patented pharmaceutical compound.

¹⁹ Ronald H. Coase, *The Problem of Social Cost*, 3 J.L. & ECON. 1, 16 (1960).

²⁰ *Id.*

Coase focused on transaction costs as the principal threat to market efficiency. But more generally the threat could be anything that gets in the way of efficient trade, such as a legal rule that discourages efficient patent licensing. And the courts may create such an incentive when they tether patentees to the terms of their prior dealings with nonparty licensees—a result that injures patentees, prospective licensees, and consumers.

A. ANATOMY OF AN EFFICIENT LICENSING MARKET

In order to determine how standards for computing damages are likely to impact licensing markets, the first question to ask is how a well-functioning licensing market would operate in a typical case. For example, what factors determine the license fees in a particular case? How consistent are the terms and scope of different transactions for the same licensing rights? This section addresses these issues and demonstrates that, for a number of reasons, patent licensing markets tend to be more complex and irregular than conventional product markets.

Some markets, such as the market for toasters, are quite simple. They involve very little variability among the terms or scope of different transactions. All buyers of a particular model will receive exactly the same toaster, and they will all use it for the same purpose: making toast. Further, because transaction costs are high in relation to transaction value, the manufacturer will set a fixed price, and all buyers will pay exactly that amount. Thus, if the price of the toaster is fixed at \$10, then we can safely presume this is the same amount that any counterfactual buyer would have been made to pay for it.

For other kinds of products, such as home remodeling, the market is much less consistent, with comparatively little similarity among different transactions. A typical contractor may remodel a hundred homes, but he is probably not asked to do exactly the same thing in any two cases. Thus not all customers are receiving the same thing. Similarly, because some remodels are more elaborate or difficult than others, the price level will vary from one transaction to the next. A home renovator will not charge a fixed amount to all customers but will instead negotiate a custom agreement with each customer. As such, it is largely impossible to identify an “established price” in the market for home renovations.

When courts rely on licensing-based damages, they implicitly treat patent licenses like toasters; they presume that the price paid by one licensee is a strong predictor of what any other licensee would pay for the same rights. But the truth is that patent rights are much more complex, and in fact they tend to act more like home renovations.²¹ There are many important variables, discussed in detail below,

²¹ A prominent exception is a licensing market for a standards-essential patent: a patent whose claimed technology must be used by any product that comports with a particular technological standard. Such patents are very widely-licensed, and frequently the patent holders pledge that they will be licensed on “reasonable and nondiscriminatory” (RAND) terms, which will involve setting

that will tend to affect the terms of trade with different prospective licensees. If the patent holder simply charged a fixed price to everyone, many potential licensees would simply refuse to license. This is the case even if the parties could reach a mutually beneficial agreement at a lower price. Furthermore, much like a home renovation, the value of a licensing transaction is usually high in relation to transaction costs, enabling patent holders to bargain individually with licensees.²² Thus, within patent licensing markets, price discrimination—the practice of charging different prices to different customers²³—is generally a necessary and feasible way of achieving market efficiency.²⁴ Yet by treating patent rights like commodities, the courts inadvertently discourage price discrimination and, by extension, the efficient licensing of patented inventions.

Intuitively, if there is a diverse set of prospective licensees, then it is unlikely that linear pricing—charging the same price to everyone—will achieve market efficiency. In such a case, the patent holder will have to charge different prices to different buyers. In the extreme case the patent holder would engage in “first degree” or “perfect” price discrimination, meaning that it charges each potential licensee a price that is exactly equal to its willingness to pay for a license, which would reach an efficient result by eliminating deadweight loss.²⁵ However, it is not actually necessary that the patent holder gets all of the trade surplus in every transaction; as a matter of efficiency, it is just as well (and certainly more equitable) for the patent holder to bargain individually with all prospective licensees, in each case choosing a price that leaves both parties better off.²⁶ In what follows we refer to this more general variety of price discrimination as *discriminatory bargaining*.

a common royalty rate for all licensees. See, e.g., Scott J. Miller, *Standard Setting, Patents, and Access Lock-In: RAND Licensing and the Theory of the Firm*, 40 IND. L. REV. 351, 353 (2007). In these cases, the licensing market looks more like a conventional product market.

²² Another reason bargaining would tend to be feasible here is that a licensor may be able to determine how much value the licensee derives from the relevant patent rights by simply considering the licensing application and how it will affect the licensee’s product. By contrast, if the relevant product is a toaster, there is a significant asymmetric information problem because the seller cannot generally predict the value a buyer places on the toaster.

²³ More accurately, price discrimination means a disparity in prices charged to different customers that is not explained by a corresponding disparity in the costs of supplying these different buyers. However, for our purposes it is sufficient simply to consider all situations that might induce a patent holder to charge different fees to different licensees. That is, in what follows, “price discrimination” refers to any situation in which a patent holder receives different fees from different licensees of the same patent. Note that, unless a firm always prices at marginal cost, price discrimination is always necessary to achieve economic efficiency. However, due to high transaction costs, perfect price discrimination is almost never feasible.

²⁴ The concept of price discrimination was first introduced by economist Arthur Pigou. See ARTHUR C. PIGOU, *THE ECONOMICS OF WELFARE* 275–89 (1920). For a modern overview of price discrimination and its effects, see Hal R. Varian, *Price Discrimination*, HANDBOOK OF INDUSTRIAL ORGANIZATION 597 (Richard Schmalensee & Robert D. Willig eds., 1989).

²⁵ See, e.g., Daniel J. Gifford and Robert T. Kurdle, *The Law and Economics of Price Discrimination in Modern Economies: Time for Reconciliation?* 43 U.C. DAVIS L. REV. 1235, 1241 (2010) (noting that first degree price discrimination eliminates deadweight loss).

²⁶ That is, all mutually beneficial deals are executed, but we make no assumption about how the parties split the licensing surplus in any given transaction.

The differential welfare effects of linear pricing and discriminatory bargaining are easily seen in the juxtaposed graphs in Figure 1. Here the top and bottom graphs correspond to linear pricing and discriminatory bargaining, respectively. The x-axis can be interpreted as the set of prospective licensees, arranged in decreasing order of their willingness to pay (WTP) for a license. The dotted line in each graph gives the prices charged to these licensees. A licensee will pay for a license only if its willingness to pay exceeds the price it is charged. Linear pricing generates deadweight loss, which captures the forgone value of efficient deals that were not executed, because not all buyers have a WTP that exceeds the constant price level.

By contrast, under discriminatory bargaining, the price is lower for a licensee with a lower WTP, reflecting that bargaining allows the patent holder to tailor each license fee to the specific needs and preferences of the corresponding licensee. The patent holder is able to transact with all prospective licensees, which achieves market efficiency.²⁷ In each graph, market welfare (of the patent holder and its licensees) is given by the sum of the unshaded regions, CS (consumer surplus, which captures the welfare of licensees), and PS (producer surplus, which captures the welfare of the patent holder). As the graphs reflect, market welfare is higher under discriminatory bargaining. There is no deadweight loss in this case because no efficient transactions are forgone. Accordingly, $Q^{DB} > Q^{LP}$, where the numbers Q^{DB} and Q^{LP} give the quantities of licenses sold under discriminatory bargaining and linear pricing, respectively.

The problem with linear pricing is that it cuts off the bottom segment of the market. The only efficient linear price would be zero. But the patent holder, which maximizes its own licensing receipts, would never set such a generous price. This would give it a profit of zero. Rather, just like an oligopolist in a conventional product market, the patent holder charges an inefficiently high price to everyone. Thus price discrimination is preferable for both licensees and the patent holder.

²⁷ More accurately, the patent holder licenses to every prospective licensee with whom mutually beneficial licensing is possible. As noted below, if a prospective user is a direct competitor, then there may be no licensing terms that would leave both parties better off.

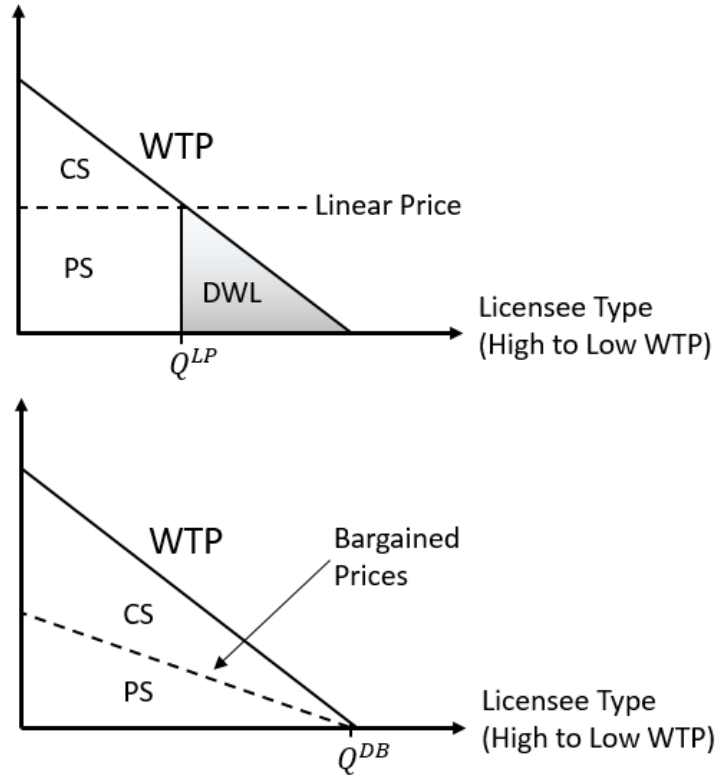


FIGURE 1: Linear Pricing (Top) Versus Discriminatory Bargaining (Bottom)

There are a number of reasons why a typical patent holder would like to discriminate in the terms of different licensing transactions. First, different licensees may not be willing to pay the same amount. This is not only a function of the licensee’s characteristics. It can also be a result of changes in the number of alternative technologies that are available, or of the circumstances under which a licensing agreement is reached. Furthermore, a patent holder may have its own motivations for charging different amounts to different users. In what follows, we illustrate some of the most important variables that will tend to affect the terms of trade, variables that are largely ignored when a court focuses myopically on prior licensing terms.

(i) Alternative licensing applications. Different licensees may intend to apply the patented technology in different ways, which may vary in the extent to which they enhance the licensees’ profits. For example, suppose the patented technology is a spray-on coating that makes steel products more resistant to rust. There are many product manufacturers that could benefit from this. At one end of the spectrum, a licensee that manufactures mufflers for cars would receive substantial utility from the invention, for rust creates holes that prevent a muffler from functioning. On the other hand, a licensee that produces sledgehammers derives much less value from the technology, implying it is not willing to pay nearly as much. Rust does not impede the functionality of sledgehammers, so the benefit is merely a shinier sledgehammer. Even though these two licensees have acquired the

same rights, they are paying for different kinds of product enhancements: the muffler maker is paying for improved functionality, while the sledgehammer maker is paying for an aesthetic improvement. As this illustrates, a given patent license may represent very different things to different licensees.

(ii) Obsolescence; increased competition in the licensing market. In many cases, the value of a given patent license will depreciate over the patent term.²⁸ There are two principal reasons for this. First, the patented technology may grow obsolete over time, as it is gradually surpassed by more sophisticated or popular technologies. For example, the digital video disk (DVD) was initially a very popular technology for storing movies for in-home viewing, but it is growing obsolete over time as improved technologies like Blu-ray and digital streaming have become more widely available. A related problem is that although a technology may not grow obsolete in the sense that it becomes inferior, the licensing market may nevertheless grow more competitive over time.²⁹ That is, as time passes, more and more viable alternatives may enter the licensing market. And, of course, prices are lower in a more competitive market, implying that license fees will tend to fall as the field of competitors grows larger over time. This means that the precedent set by a prior agreement may overstate the value of a license later in the patent term.

(iii) Commercial relationship between the parties. A licensing agreement benefits the patent holder only if it provides license fees in excess of the benefit it would get by excluding the licensee's use. And the value of such exclusion is larger when the licensee is a competitor. Thus a patent holder will tend to charge larger license fees to firms with which it competes on some level. So, for example, if a patent holder charges a rival a \$10 per-unit royalty and later sells this patent to a non-practicing entity (NPE), it does not follow that the NPE and a similar user would reach an agreement for the same \$10 per unit. On the other hand, if the patent holder and licensee sell *complementary* products—e.g. a smartphone operating system and smartphone apps—then the patent holder may be willing to accept a lower license fee, all else being equal.

²⁸RICHARD A. POSNER & WILLIAM M. LANDES, THE ECONOMIC STRUCTURE OF INTELLECTUAL PROPERTY LAW, 311–12 (2003).

²⁹“Biosimilar” or “bioequivalent” pharmaceutical drugs are a good example. These drugs mimic patented drugs without infringing their patents by using different molecules or compounds to achieve substantially the same results. See, e.g., *Abbott Laboratories v. Sandoz, Inc.*, 486 F. Supp. 2d 767 (N.D. Ill. 2007) (declining to hold that a bioequivalent drug infringed a pioneer patent under the doctrine of equivalents simply because it achieved similar therapeutic results); *Acorda Therapeutics, Inc. v. Apotex*, 2011 WL 4074116 at *9 (D.N.J. Sept. 6, 2011) (same); *Adams Respiratory Therapeutics, Inc. v. Perrigo Co.*, 616 F.3d 1283 (Fed. Cir. 2010) (explaining the difference between the conclusion that a drug is bioequivalent and the analysis of infringement under the doctrine of equivalents).

(iv) Invention around the patent. A licensee is willing to pay less when it is more feasible to invent around the patent, or when the benefits of inventing around are larger. Thus, if one licensee is much more technologically sophisticated than another, it would tend to be willing to pay less for a license as it is better equipped to invent around the patent. Similarly, all else being equal, invention around the patent is more valuable when there is more time remaining in the patent term. The cost of inventing around the patent (a fixed cost) will be amortized over a larger number of sales. Thus, all else being equal, a licensee would tend to be willing to pay a larger royalty rate if there is less time remaining in the patent term, in which case invention around is less worthwhile.

(v) Financial constraints. Patent licensing agreements often call for the licensee to pay a two-part tariff: an initial lump sum in addition to a per-unit royalty on licensed sales.³⁰ If a licensee is financially constrained at the time of agreement—say, because its business is not yet profitable and it does not have easy access to the capital markets—then it may be willing to pay a larger royalty in order to avoid paying a large lump sum. Thus a high royalty may simply reflect a financing deal aimed at spreading out the licensee’s total obligations over time; if the deal instead involved a well-heeled licensee, the royalty rate might be much lower, even if both of these licensees happen to get the same benefits from the license. The same logic also applies in the other direction. If the patent holder is in poor financial shape at the time of the agreement, it may be willing to accept a lower royalty in exchange for a larger upfront fee. Here too this has nothing to do with the value of a license.

(vi) Sunk cost investments. In some cases, the patent holder has some leverage over the licensee, enabling it to extract larger fees than it could have hoped to garner in an arm’s length bargain. In particular, a licensee may begin developing a technology only to discover that it is already covered by an existing patent. In such a case, the patent holder can extract the costs that have already been sunk in the technology by threatening to “hold up” the infringer³¹—an outcome it could not attain through ex ante bargaining.³² Accordingly, license fees will tend to be artificially high to

³⁰ Michael D. Rostoker, *PTC Research Report: A Survey of Corporate Licensing*, 24 J.L. & TECH. 59, 64 (1984) (analyzing data on patent licensing and noting that 46% of agreements in the dataset involve both an upfront fixed fee and a per-unit royalty).

³¹ See, e.g., Mark A. Lemley & Carl Shapiro, *Patent Holdup and Royalty Stacking*, 85 TEX. L. REV. 1991, 2010 (2007) (“[T]he royalty negotiated in the shadow of litigation and holdup can significantly exceed the intrinsic value of the invention itself.”).

³² For example, in the well-known *Blackberry Case*, the non-practicing entity NTP obtained an injunction against Research in Motion (RIM), the firm that makes Blackberry devices. The devices used an email system that was held to infringe NTP’s patents. But RIM had already made considerable sunk-cost investments in this particular system, and it would be very expensive to switch over to something else on short notice. This holdup problem gave NTP leverage to extract

the extent that the licensee has already invested in using the patented technology.³³

(vii) Information externalities. Because licensing terms are determined in the shadow of litigation, they will depend critically on the parties' beliefs about how litigation would turn out. Thus any new information that sheds light on this question may alter the terms of subsequent licensing. For example, if a patent holder has already successfully litigated its patent, then it will tend to charge higher fees in subsequent licensing negotiations, all else being equal. The parties update their beliefs based on what they learned from the lawsuit, and so a successful lawsuit will tend to shift expectations in favor of the patentee. Alternatively, the establishment of a new legal precedent—say, a refinement of some relevant patent eligibility rules—may shed new light on whether the patent is likely to be held valid. This too would tend to affect the licensing terms in subsequent negotiations.

(viii) Uncertain value of a licensing application. Related to the last point, at the time of contracting the patent holder and its prospective licensee may be uncertain as to how much value the patented invention will provide the licensee. For example, it may be that the patented invention has not previously been applied in the way contemplated by the licensee. As such, the royalty rate in the first licensing transaction would ordinarily be lower or higher than in subsequent agreements, depending on whether the application proves to have relatively low or high value. For example, if the first application does better than expected, then subsequent licensees would ordinarily pay more for it, all else being equal.

a massive settlement worth more than \$600M – about twenty times the amount that the lower court had awarded as damages. *See* NTP, Inc. v. Research in Motion, Ltd., 397 F. Supp. 2d 785 (E.D. Va. 2005). As numerous commenters have noted, this holdup problem allows the plaintiff to capture a much larger payoff than it could even have obtained in an arm's length deal. *See, e.g.,* Lemley & Shapiro, *Patent Holdup*, *supra* note 30, at 2010.

³³ The courts already recognize an extreme case of this leverage problem. In particular, if an independent inventor goes so far as to commence infringing sales by the time licensing negotiations commence—implying licensing is achieved under threat of litigation—then a court will typically place less evidentiary weight on this agreement when calculating damages in a later case. *See, e.g.,* Hanson v. Alpine Valley Ski Area, Inc., 718 F.2d 1075, 1078–79 (Fed.Cir.1983) (noting that license fees set in settlement of an infringement action should not serve as a basis for damages, since they “may be strongly influenced by a desire to avoid full litigation”) (internal quotation omitted); Masur, *supra* note 5, at 124–25 (“[C]ourts and commentators generally disfavor licenses that parties negotiated as settlements to ongoing litigation.”). Paradoxically, however, some courts decline to adhere to this limitation despite acknowledging that it exists. *See, e.g.,* Intellectual Ventures I LLC v. Symantec Corp., 2016 WL 937220, at *4 (D. Del. Mar. 10, 2016) (noting that settlements are generally not a good basis for damages, but nevertheless awarding damages based on a settlement, citing the fact that the settlement involved a patent that was “sufficiently comparable” to the patent in suit).

(ix) Patent complementarities. If a licensee already has the rights to one or more patents that are complementary to the one being licensed, then it derives a larger marginal benefit from the license, all else being equal. This could arise because the patented technologies are complementary in the sense that it is convenient to use them both simultaneously, or because the licensee has a patent that is blocked by the licensed patent.³⁴ For example, suppose the licensee has a patent on an improved version of the technology covered by the licensor's patent. The licensee would be willing to pay not for the right to use the patentee's inferior technology, but for the right to use its own superior version. All else being equal, this licensee's willingness to pay is higher than that of an alternative licensee who lacks any rights to the improvement.

As the above examples illustrate, there are many variables that shape the terms of a licensing agreement. For a licensing market to operate efficiently, patent holders must not be discouraged from price discrimination when licensing to different licensees. Of course, some (but not all) of the variables discussed above are already addressed in later *Georgia-Pacific* factors. For example, factor five highlights the relevance of the commercial relationship between the plaintiff and defendant, such as whether they sell competing or complementary products, as addressed in point (iii) above.³⁵ But the point is that these factors, along with the other variables mentioned above, tend to undermine the appropriateness of factor one as the sole or primary basis for calculating patent damages.

III. COLLATERAL EFFECTS OF PATENT LICENSING

Ideally, a single instance of patent licensing would be an isolated event that binds only the parties, and only to the extent contemplated by their agreement. In this case, licensing would not create disadvantages in future dealings or disputes arising outside the scope of the agreement. But when courts rely on prior agreements as a basis for damages, they unwittingly tether patentees to the terms of their prior agreements. This creates problematic repercussions for patent owners, which in turn can make them more reluctant to license in the first place.

A. REDUCED FUTURE DAMAGES

In Part II we described the many reasons why the licensing price agreed to by one licensee might not accurately reflect the value of the same patent to another

³⁴ Patent *A* blocks patent *B* if one cannot practice *B* without also practicing *A*. This means that a licensee who wants to use the technology covered by *B* must obtain licenses for both patents. See Robert P. Merges, *Of Property Rules, Coase, and Intellectual Property*, 94 COLUM. L. REV. 2655, 2659–60 (1994).

³⁵ *Georgia-Pacific Corp. v. United States Plywood Corp.*, 318 F. Supp. 1116, 1120 (S.D.N.Y. 1970), *mod. and aff'd*, 446 F.2d 295 (2d Cir. 1971) (listing “[t]he commercial relationship between the licensor and licensee, such as, whether they are competitors” as the fifth factor).

licensee. For a variety of reasons, patent owners might charge one licensee more or less than another, even for the same license to the same patent. Accordingly, even at first blush the amount of a prior patent license may not provide an accurate guide to patent damages in a later case. However, these types of errors will be random, rather than biased. Sometimes the price of a license will be greater for the first licensee than the second; sometimes less. If patent licenses introduced only random errors, rather than biases, into courts' calculations of damages, these errors might be shrugged off as tolerable. After all, it is not as if the available alternative methods for calculating damages are unerring.

Yet these are not the only or necessarily even the most severe distortions introduced by using prior licenses as guides to patent damages at trial. The use of licenses to calculate damages also creates a downward bias on patent damages due simply to the probabilistic nature of patents.³⁶ When a patent owner and potential licensee negotiate a license, both parties are aware that there is some probability that the patent will be held invalid or not infringed if the parties' dispute were to go to trial. The two parties may not share the same view as to this probability, and they may not be able to estimate it with any great certainty. But it is the very rare case in which either side can be *certain* that a court will find a patent valid and infringed. In the vast majority of cases, there is some non-zero likelihood that the defendant will prevail on one ground or another.

Accordingly, the value of any license will be reduced by the probability that the patent owner will not prevail at trial. Suppose that patent owner P and potential licensee L_1 are negotiating a license to a patented technology that is part of a product L_1 is selling. Suppose further that L_1 values the technology at \$10 million and that the parties believe that it is 50% likely that P 's patent will be held valid and infringed at trial. P and L_1 would typically agree to a license of approximately \$10 million \times 50% = \$5 million, which represents a discount on the full price to compensate for the uncertainty that is endemic to patent litigation.³⁷

Now imagine that P files suit and prevails at trial against a second infringer, L_2 , that makes a product similar to L_1 's. Once P 's patent has been found valid and infringed, the court must assess damages against L_2 .³⁸ In order to do so, one of the court's principal sources of information would be the license that P negotiated with L_1 . This license is the very first *Georgia-Pacific* factor; but more than that, it represents (to the court) the market's valuation of the patented technology. Given

³⁶ For an extended discussion of this point, see generally Masur, *supra* note 5.

³⁷ To be sure, this simplified model elides many factors, including the possibility that the parties would face asymmetric stakes in litigation, asymmetric costs, holdup problems, or any number of other variables. This stripped-down analysis is offered in support of a single point: that the value of any patent license will be discounted to reflect the uncertainty surrounding whether the patent will in fact be held valid and infringed. Adding further complexity and detail to the model will not alter that fact.

³⁸ Damages are of course a jury question; our reference to "the court" is meant to include both the jury's calculation and the judge's involvement in designing jury instructions, allowing (or not allowing) evidence of damages, or adjudicating motions for additur or remittitur.

the difficulty of accurately estimating the value of patented technology from expert reports and pricing information alone, one would expect courts to seize upon this type of market-based indicator. Indeed, this is what courts typically do. Past licenses of the same or similar technology to similarly situated licensees are considered highly reliable indicia of a patent's value, and courts commonly award damages in the range of prior licenses. Here, then, the court would likely award damages against L_2 and to P of approximately \$5 million in accordance with the license that P and L_1 negotiated.

Yet a damages award of \$5 million would be error. As a matter of black-letter patent law, the appropriate amount of damages is the licensing fee that the parties would have negotiated *had they agreed that the patent was valid and infringed*. That figure is \$10 million—the full value of the patented technology to L_1 . The \$5 million license is the full value of the technology discounted by the probability that the patent will be held invalid or not infringed. A court cannot simply treat an actual license as if it were granted pursuant to a negotiation in which both parties viewed the patent as valid and infringed. It is rarely the case that both parties to a license will view infringement and validity as certainties, and indeed such cases may not even exist. The court cannot rely upon the \$5 million license between P and L_1 as if it represents the underlying value of the patent, stripped of all uncertainty.

Accordingly, when courts use existing licenses to assess damages, they will inevitably undervalue the patents in suit. Essentially every licensing amount will be discounted to reflect some probability that the patent will be held invalid or not infringed.³⁹ If that probability is greater than zero, the licensing fee will be less than the value of the underlying patented technology. Only in the rare case when the parties agree that the patent is 100% likely to be held valid and infringed will the license provide an accurate guide to damages. Otherwise, the license will represent only some proportion of the overall value the court is attempting to determine.

Nor can the court back out the parties' true value simply by scrutinizing the license. Even if the parties did agree upon a value for the patent and a probability of success at trial—and they likely did not—the license will not reveal this information. The license will almost certainly include only one dollar figure: the amount of the license itself. If two parties negotiate a license for \$5 million, the court will have no way to determine whether the parties believed that the patented technology was worth \$5 million and the patent was 100% likely to be held valid and infringed, or whether the technology was worth \$10 million and the patent was 50% likely to be valid and infringed, or some other arrangement.

This opacity presents a fundamental problem for any court that seeks to use existing licenses as guides to patent damages. The court cannot determine the true

³⁹ The only important exception is when the licensee's best outside option is to design around the patented feature. Lemley & Shapiro, *supra* note 31, at 2003-05.

value of the patent from the license, and furthermore it would be error for the court to simply use the value of the existing license as a measure of damages.

B. DISTORTED FEES IN FUTURE LICENSING

The last section showed that licensing-based damages can lead to under-compensation by failing to account for uncertainties that shape license fees. A corollary is that this under-compensation will generally translate into reduced fees in future patent licensing. As already noted, licensing terms are shaped principally by the parties' expectations of how litigation would play out. Thus, if the parties expect damages to undercompensate, then this provides prospective licensees with a bargaining chip for securing lower license fees than the patentee would ordinarily accept.

Consider an example. There are two prospective users – L_1 and L_2 – that would like to license a patent owned by a patent holder, P . For each prospective user, the value of a license is \$100,000. For the sake of simplicity, assume each of their intended applications clearly reads on the patent (i.e., there is no uncertainty on the infringement question), but the patent may or may not be valid. Specifically, all parties believe that there is a 50% probability that the patent will be held valid. Suppose that P is initially approached by L_1 to strike a licensing deal. Since there is no prior licensing deal on which to base damages, they presume that damages would be assigned somewhat randomly, but with an expected value equal to the full value of a license (\$100,000).⁴⁰ However, knowing that there is a 50% chance that the patent is invalid, they discount this amount by half, and thus agree on a fee of \$50,000.

Now suppose that, after this agreement is formed, L_2 approaches P to strike a second licensing deal. The parties expect that a court would base damages on the prior agreement, providing an award of \$50,000. However, as before, the parties believe that P has only a 50% chance of winning, so they discount the expected award by half, resulting in a license fee of \$25,000. Thus, even though there are no material differences between the licensees, the second agreement results in lower fees. By contrast, if the courts did not adhere to the licensing-based damages standard, then nothing would change in the second agreement; the negotiated fee would be the same \$50,000.

The problem is that, by basing damages on the prior license fee, the courts fail to filter out the “uncertainty discount”—the percentage by which the license fee was reduced to reflect P 's uncertain litigation prospects—from the prior agreement. The damages award subsumes this uncertainty discount. But subsequent licensing negotiations also occur under uncertainty—as before, P is not certain to win in court—resulting in a second round of discounting. As a consequence, the fee

⁴⁰ This assumption is not at all essential to the argument; it just makes things simpler. Even if expected damages were different from \$100K, subsequent licensing would still result in lower fees.

reached in the second agreement carries two iterative discounts—one reflecting uncertainty in the present agreement, and one reflecting uncertainty in the first agreement. Of course, there is no good reason that the fee charged in one agreement should reflect the uncertainty faced in another. But this nonsensical result is nevertheless a rational response by the parties to licensing-based damages.

Even if there is no uncertainty about the patent holder’s litigation prospects, a prior licensing agreement may come back to haunt the patent holder. This can occur when efficient licensing would involve significant price discrimination. Consider the following example. A patent holder is initially approached by a prospective licensee, Beta, who values a license at \$100,000. As in the preceding example, suppose that the court’s damages, if not based on any prior agreements, would equal the full licensing value (\$100,000) in expected value. But in this case suppose that the patent holder is certain to win if it brings an infringement claim. Thus the patent holder can extract the full \$100,000 from Beta.⁴¹

After this agreement is formed, another prospective user, Alpha, approaches the patent holder. Alpha attaches much more value to the patented invention—say, because it provides a larger incremental benefit when applied to Alpha’s product—and is willing to pay as much as \$500,000 for a license. If the parties expected damages to equal the license value—as they did in the first agreement—then the patent holder could extract a fee of \$500,000. However, this is not possible if a court will award damages based on the prior agreement. In this case, the expected damages are just \$100,000—one fifth of what the patent holder would have received but for the prior agreement. In fact, even if Alpha were held to have willfully infringed, treble damages would only amount to \$300,000, still substantially less than what the patent holder could ordinarily obtain.⁴² In either case, licensing-based damages inadvertently compel the patent holder to give Alpha a steep discount.

The same problem could cut in the opposite direction, benefitting patent holders and injuring defendants. This may be particularly pronounced in situations in which a defendant has unintentionally infringed the patent and damages are likely to be based on the terms of a prior agreement that happened to involve a relatively high royalty rate. To illustrate, imagine, in the above Alpha-Beta example, that Alpha had been the first to approach the patent holder and licensed the patent for \$500,000. Now suppose that Beta later unintentionally infringed the patent. Based on the prior agreement with Alpha, a court would require Beta to pay damages of \$500,000—five times more than it would otherwise pay.

⁴¹ Alternatively, they could split the surplus in some way, as contemplated in the discriminatory bargaining outcomes depicted in Figure 1. But for simplicity, we assume for now that the patent holder can extract the full licensing surplus.

⁴² 35 U.S.C. § 284 (INSERT YEAR) (stating that in cases of willful infringement, “the court may increase the damages up to three times the amount found or assessed”).

To synthesize what is going on here, suppose there are two licensing agreements involving the same patent, one occurring at time $t = 1$, and the other occurring at time $t = 2$. For each t , there is a distinct licensee, L_t . Then let $V_t > 0$ denote L_t 's valuation for a license, and let p_t denote the probability that the patent holder would win an infringement suit against L_t . Note that $0 \leq p_t \leq 1$, since this is a probability. Now assume that, if damages are awarded ad hoc, they will equal the defendant's license valuation (V_t) in expected value. Let F_t denote the fee charged in agreement t , which will depend on the variables just defined. In the first agreement, there is no prior deal that would influence damages. Thus, expected damages would be V_1 , resulting in the fee

$$F_1 = p_1 V_1$$

This says that the fee in the first agreement is simply equal to expected damages (L_1 's valuation), discounted by the patent holder's probability of winning. If courts did not rely on licenses in calculating damages, the fee in the second would be analogous—it would be $p_2 V_2$ —because the parties to this agreement would expect damages to be V_2 if the patent holder won in court. But if the prior fee F_1 would instead be the basis for damages, then the fee charged in the second agreement would be

$$F_2 = p_2 F_1 = p_2 \times p_1 V_1$$

Here we can see both of the problems that came up in the preceding examples. First, F_2 nonsensically reflects uncertainty from the first agreement, as captured by the fact that it includes p_1 as a factor. This discounts the fee based on uncertainty that is entirely impertinent to the agreement in question. The second problem is that F_2 reflects the valuation of the wrong licensee—it includes the term V_1 rather than V_2 , even though the former is not a reliable guide to the present agreement. This could either increase or decrease the fee depending on how V_1 and V_2 compare. Overall, F_2 is lower than the proper fee ($p_2 V_2$) when $p_1 V_1 < V_2$, and it is higher when $p_1 V_1 > V_2$.⁴³

An implication of this analysis is that, even if there have been many prior licensing deals involving a common royalty rate, it does not follow that the court should use the established royalty as a measure of damages. The established royalty was likely discounted by the parties' uncertainty about whether the patent would be held valid and infringed. If the court were to apply the established royalty as damages, it would preserve this discount and award the infringer the same discount it might have negotiated under conditions of uncertainty. This would be a nonsensical result, for the court has just resolved that uncertainty. Preserving this uncertainty-based discount limits the plaintiff's recovery based on factors that have nothing to do with the intrinsic value of a license or the commercial injury suffered

⁴³ One obvious caveat is that, unless the second licensee has unintentionally infringed, it will never agree to pay more than V_2 . Thus, if $p_2 p_1 V_1 > V_2$, then F_2 would be truncated to V_2 .

by the plaintiff. As such, there is no reason that such factors should influence the remedy.

IV. IMPACT ON LICENSING INCENTIVES

The preceding section explained how licensing-based damages may distort damages awards and, by extension, the terms of licensing agreements. These first-order effects do not involve a direct change in the *allocation* of patent rights; they simply alter the amount of money that changes hands in the course of licensing or litigation. However, parties will anticipate these effects *ex ante* and adjust their conduct accordingly, and this second-order effect may indeed influence how patent rights are allocated. Thus, the more serious concern with licensing-based damages is that they tend to distort licensing behavior and thereby undermine the efficient dissemination of patent rights. This section addresses some of these adverse incentive problems.

A. DIMINISHED LICENSING

A patent is only as strong as the remedies that can be obtained to enforce it.⁴⁴ Thus, patent holders do not want to do anything that might undermine their ability to receive a strong remedy in the future. When the courts rely on licensing terms as a basis for damages, patent holders influence future remedies whenever they strike a licensing deal. As such, they have a strong incentive to make their patents appear valuable by licensing on relatively lucrative terms, ensuring future remedies will be comparatively strong. Unfortunately, this kind of posturing will tend to require that the patent holder forgo efficient licensing deals that can only be reached on more modest terms. The result is that the licensing-based damages standard diminishes the number of efficient licensing deals that are executed, thereby creating deadweight loss.

If efficient licensing would involve a significant degree of price discrimination, then licensing-based damages undermine efficiency by diminishing the patent holder's willingness to price discriminate. In such a case, there are a number of different licensees willing to pay variable amounts. But if the patent holder transacts with the low-valuation licensees, this may prevent it from collecting satisfactory fees in transactions with the high-valuation licensees. This would also undermine the damages the patent holder could obtain in future litigation. Thus, in an effort to avoid these outcomes, the patent holder may rationally (albeit regrettably) refuse to license to prospective users who are not willing to pay a relatively large amount for a license.

⁴⁴ Masur, *supra* note 5, at 127; Dov Greenbaum, *Academia to Industry Technology Transfer: An Alternative to the Bayh-Dole System for Both Developed and Developing Nations*, 19 *FORDHAM INTELL. PROP. MEDIA & ENT. L.J.* 311, 388 (2009) (“[W]ith no potential enforcement by the owner of the IP, potential licensees may see no incentive to ever license the patent; infringing at will.”).

A principal problem is that, at the time of licensing, a patent holder likely cannot predict how the present agreement will impact it in the future, and as such it may prefer to remain cautious and accept only a relatively high royalty rate. This derives from uncertainty about its future licensing and litigation prospects. For instance, a patent holder may be uncertain as to the various ways a patent could be usefully applied, or of which firms might be interested in licensing. (In fact, it is unlikely that a typical patent holder has perfect information about these things.) For example, at the time a patent is granted, the patent holder may suspect that there are many possible applications, but it may have so far identified only a few of them. In this case, a patent holder does not want to establish a low royalty rate early in the patent term only to learn later on that its invention has some much more valuable alternative applications. This would give the courts the mistaken impression that the patent license is not particularly valuable, allowing licensees using the more valuable application to get a steep discount. As such, a patent holder may be relatively cautious or inflexible early in the term until it has a better understanding of the patent's applications, even if it could begin striking some mutually beneficial licensing deals soon after the grant date.

Another possibility is that both the patent holder and licensees may be uncertain how valuable the licensed invention will be in practice. For example, if a new software program is added to a smartphone, it may be unclear *ex ante* how consumers will respond to the addition and, by extension, how it will affect sales of the smartphone. On one hand, a prospective licensee does not want to pay too much for a license, for the patented technology may not prove particularly helpful. On the other hand, the patent holder does not want to accept too low a royalty, for if it turns out that the application is quite helpful, it may be compelled to offer future licensees the same low rate. This reflects the fact that a prospective licensee is thinking only about the deal in question, but the patent holder must think about how the deal will affect its future licensing and litigation prospects. This could lead to delays in licensing or to a complete breakdown in negotiations.

More generally, licensing-based damages will tend to replicate the deadweight loss problem that results from linear pricing, which was illustrated in Figure 1. This is not because it induces a patent holder to charge identical royalties to all comers. Rather, it will tend to induce a patent holder to choose some minimum royalty rate below which it refuses to license, and then bargain only with those firms willing to match or exceed this threshold. Because there are likely to be some mutually beneficial licensing opportunities that require a lower royalty rate, this creates deadweight loss by foreclosing some efficient transactions.

Diminished future license fees are not the only thing that may deter the patent holder from licensing at a relatively modest royalty rate. The patent holder may have a strong interest in excluding a direct competitor from using the patented technology, and it may be able to do this only if it refuses to license at anything less than a high royalty rate, or perhaps only if it declines to license *at all*. As noted in an earlier section, it may be impossible for a patent holder and a direct competitor

to reach mutually beneficial licensing terms. This is not surprising. The right to exclude competitors is a principal source of patent value, and many firms do not license their patents to direct competitors. At the same time, it may nevertheless be possible to license a patent to non-competitors. The patented invention may have useful applications within non-competing products. In this case, market efficiency would involve licensing to non-rivals but not the competitor. Nonetheless, the patent holder may rationally refuse to license to *anyone*. Licensing might establish a royalty rate that it would never accept from the competitor, which would provide its rival with leverage in future litigation. That is, licensing might prevent the patent holder from obtaining an adequate remedy if the competitor went on to infringe the patent.

Licensing-based damages need not always work to a patent holder's detriment, however, notwithstanding that they result in fewer licensing transactions. If the patent holder earns significantly larger fees but strikes fewer licensing deals, the former effect may dominate the latter. This could lead overall licensing revenues to increase. This can happen if the market value of a license declines after the patent has been licensed at a relatively high rate—say, because a number of competing alternatives entered the licensing market—so that a licensee in an arm's length bargain would subsequently pay only a small fee. In this case, the patent holder's best strategy may be to rely on a “wait and sue” approach. It could sit on its rights and use its high established royalty to secure supra-competitive fees from unintentional infringers. In this case, the patent holder would not want to bargain at arm's length, even though this would likely result in more deals being consummated, because it could garner only small fees in these agreements. Rather, it would prefer to bargain only when it has leverage—liability for damages that will be based on the high prior royalty—with which it can extract excessive fees.

B. ROYALTY GAMESMANSHIP

When patent owners do agree to license their IP, they will also have incentives to obfuscate or distort the terms of those licenses. If courts will look to existing licenses to determine patent damages, then patent owners have every reason to structure those licenses such that the price appears to be as high as possible. There are a variety of strategies that patent owners might employ, and here we canvas a sampling of them.

First, the patent owner might attempt to bundle other goods along with the patent as part of the license in exchange for a higher licensing price.⁴⁵ The patent license might be drafted to include other forms of IP, such as trademarks or trade secrets relevant to the patented technology. It might include the provision of tacit knowledge, such as a promise by the patent owner to direct its scientists and

⁴⁵ Masur, *supra* note 5, at 142.

engineers to help the licensee implement the patented technology.⁴⁶ Or it might be paired with a future promise of some type, such as an unstated agreement to separately cross-license some other technology owned by the licensee.

These types of maneuvers are not necessarily welfare-diminishing, though they may result in future patent infringers being forced to pay excessive damages at trial.⁴⁷ However, the process of negotiating them could increase transaction costs. And if the parties are not able to agree upon the higher price to be paid for these additional considerations, the result could be that the opportunity to license the patent is forgone entirely.

At least in theory, courts police existing licenses for this type of strategy. The Federal Circuit has instructed trial courts that they are not to use existing licenses as a measure of damages when those licenses include consideration other than merely a license to the patent itself.⁴⁸ In practice, it is difficult to know how successful these policing efforts really are. But even if courts are entirely successful at weeding out patent licenses that include inducements beyond the patent itself, that will only solve one problem—the problem of inflated damages verdicts. In fact, it will simultaneously *heighten* the incentives of patent owners to negotiate licenses that include more than just the right to use the patented technology. Patent owners will understand that if they can lard up the license with other considerations, courts will not rely upon the license as a guide to future damages. And because the use of existing licenses typically leads to underestimations of patent damages, patent owners will be eager to take their own existing licenses out of consideration. The result could be a proliferation of needlessly complicated licenses involving considerations that neither party values especially highly—and thus excessive transaction costs.

A second strategy that a patent owner might employ is to engineer the sequence of licenses it negotiates, with the highest-value licenses negotiated first (and before any trial occurs). For instance, low-volume licensees—parties who only plan to use the patented technology in a small number of units or over a short time period—might well be willing to pay higher per-unit prices than higher-volume users. Because the patent license will consume a lower proportion of a low-volume user’s

⁴⁶ See generally Peter Lee, *Transcending the Tacit Dimension: Patents, Relationships, and Organizational Integration in Technology Transfer*, 100 CALIF. L. REV. 1503, 1516 (2012) (explaining that patent licenses can facilitate the transfer of tacit knowledge).

⁴⁷ Cf. Keith N. Hylton & Mengxi Zhang, *Optimal Remedies for Patent Infringement* (laying out a formal model that describes the optimal amount of damages patent owners should receive).

⁴⁸ See *ResQNet.com, Inc. v. Lansa, Inc.*, 594 F.3d 860, 873 (Fed. Cir. 2010) (“In sum, the district court erred by considering ResQNet’s re-bundling licenses to significantly adjust upward the reasonable royalty without any factual findings that accounted for the technological and economic differences between those licenses and the ‘075 patent.”); see also John Elmore, *The Technological Comparability of Patent License Agreements*, 46 LES NOUVELLES 115, 116 (2011) (“[C]ase law cautions that patent license agreements providing substantial non-patent benefits or multiple patents may not be comparable to a ‘straight’ patent license.”).

overall budget, that user might be more willing to settle quickly on a higher price rather than consuming greater resources haggling over a lower one.

There is nothing inherently problematic about strategically sequencing licensing negotiations, but again, as with the tactics detailed above, any additional complications introduced into the licensing process could derail parties from ever reaching agreement. For instance, imagine a situation in which a large-volume potential licensee wishes to negotiate a license to a valuable patent. The patent owner might prefer to delay consummating this license until after a trial concludes, or until after the patent owner has negotiated a separate license with another party for the same technology. In the meantime, the potential licensee—not wishing to be left in limbo—might adopt a different (and inferior) technology or simply drop the relevant line of business entirely. The result would be needless social costs driven entirely by the patent owner’s desire to structure its licensing behavior in light of courts’ misuse of licenses in assessing damages.

Third and finally, a patent owner might attempt to structure the terms of a licensing agreement to make the license appear more lucrative on a per-unit basis than it actually is. There are a variety of ways to accomplish this, but the general idea is that the license is written as if it covers fewer units or a shorter period of time than it does in fact.⁴⁹ For instance, suppose that a firm has been infringing a patent from 2012 through 2016. Imagine that the parties are willing to agree to a license of \$10 million per year of infringing activity, or \$40 million total. The patent owner might instead suggest that the license be written to cover the years 2014 through 2016 only, yet for the same amount of \$40 million. To a court (or a future licensee), the licensing price would appear to be \$20 million per year, rather than \$10 million. The parties might then arrive at an understanding (which they do not memorialize) that the patent owner will not sue the licensee for infringement from 2012 to 2014. Or the parties might simply rely upon the doctrine of laches to block suit for that period.⁵⁰

A roughly equivalent strategy is to draft a license that intentionally understates the number of units it is meant to cover. For instance, imagine that the patent owner and putative licensee agree that the licensee intends to use the patented technology in 10 million manufactured units and is willing to pay \$4 per unit, or \$40 million in total. The parties might draft a license stating that the patent owner grants a license in exchange for a lump sum of \$40 million. The license might then further state that the parties “anticipate that the licensee will produce 5 million units”—which implies a price of \$8 per unit. This language could be drafted to be unenforceable: if the licensee produces more than 5 million units—which both parties expect will occur—that does not void the license or alter its terms. For the licensee, nothing is

⁴⁹ See Layne S. Keele, *Res “Q”ing Patent Infringement Damages After ResQNet: The Dangers of Litigation Licenses as Evidence of a Reasonable Royalty*, 20 TEX. INTELL. PROP. L.J. 181, 228 (2012) (describing this type of arrangement).

⁵⁰ See *Carnegie Mellon Univ. v. Marvell Tech. Grp., Ltd.*, 807 F.3d 1283, 1298 (Fed. Cir. 2015) (discussing the legal standard for laches in patent cases).

lost. And for the patent owner, the patented technology appears to be more valuable than it actually is.

Or, in the alternative, a licensor could include geographic or field-of-use restrictions that are meaningless to the particular licensee but make the license seem more valuable than it really is.⁵¹ For instance, a license granted to a firm that only does business in California could be written to state that it is “only valid in California.” Or a license granted to a firm that manufactures medical devices could be written to state that it “only applies to medical devices,” making it appear that a more general blanket license would be more expensive. These sorts of tactics are not merely hypothetical. There are several cases on record in which a patent defendant has alleged that a licensor has engaged in one or more of these tactics in an effort to inflate the perceived value of a patent license.⁵²

Again, the primary result of these practices will likely be to inflate the prices that future licensees or infringers held liable at trial will be forced to pay. Standing by itself, that may not create tremendous social loss. But the process of negotiating such a license could involve greater transaction costs than would accrue if the parties were “playing it straight,” and in some cases the result might be a foregone licensing opportunity. These are potentially significant social costs, generated by the ways in which courts use licenses to value patents.

The general theme of this section is that an arms-length market valuation of a good, such as a patent, is only as reliable as the parties negotiating it. When one party has an incentive to strategically inflate or alter the terms of that license, the license can no longer be counted upon to provide accurate estimations of a patent’s value. Moreover, the fact that licenses play such a central role in calculating patent damages—and the manner in which courts employ licenses in that calculation—creates incentives for patent owners who are repeat players to manipulate licensing terms whenever possible. The ripple effects of courts’ treatment of licenses are persistently negative.

C. CONFIDENTIALITY IN PATENT LICENSING

If patent licensees cannot inflate the value of the licenses they negotiate—or perhaps even if they can—they might respond by attempting to keep the licenses confidential. If information regarding the licenses cannot be disclosed, then they cannot be used against the patentee to reduce damages at trial. Patentees might thus

⁵¹ Masur, *supra* note 5, at 142.

⁵² See *Microsoft Corp. v. Motorola, Inc.*, 2013 WL 2111217, at *2 (W.D. Wash. 2013) (in which Motorola introduced as evidence of damages a license that it had negotiated with a smaller firm and that may have been inflated for purposes of driving up Microsoft’s damages); *Ericsson, Inc. v. InterDigital Commc’ns Corp.*, 418 F.3d 1217 (Fed. Cir. 2005) (in which Nokia accused InterDigital of artificially inflating the value of its patents to increase Nokia’s required payments); Masur, *supra* note 5, at 142–43 (describing these cases).

protect licensing agreements with confidentiality provisions and non-disclosure guarantees in an effort to prevent them from being disclosed in the event that the licenses become relevant in future litigation.

In most cases, however, this strategy will not succeed. For the most part, district courts have permitted discovery of prior licenses, even licenses protected by confidentiality agreements, when the licenses appear relevant to the question of damages.⁵³ (Of course, our argument is that these licenses are almost never relevant to the damages calculation, but courts do not yet subscribe to that view.) In some cases, courts will issue a protective order that permits discovery of the documents but prevents the parties and their attorneys from further disclosing the information outside of the trial.⁵⁴ In some cases, courts will prohibit discovery of prior licenses when the court does not believe that the licenses are highly probative of the damages issue before the court.⁵⁵ At least one district court has also held that ongoing or unconsummated settlement and licensing negotiations involving the patents-in-suit are not discoverable.⁵⁶ Accordingly, in some circumstances patent owners might be expected to delay finalizing licensing agreements until after the conclusion of a contemporaneous trial. Nonetheless, our review of the case law leads us to conclude that existing licenses will be discoverable in the majority of cases.

Attempting to shield licenses with confidentiality agreements might be thought of as one species of the greater genus of methods that patentees might use to eliminate existing licenses as guides to damages. As we observed in the preceding section, some patent holders might seek to render licenses useless as measures of damages by bundling them with other goods. This is only a partial solution because the licensing price still represents a floor on the value of the patent. It is similarly unlikely that patent owners will be able to shield licenses using confidentiality agreements, as we explained. But it is important to note that these methods are not mutually exclusive. A patent owner could bundle a patent license with other goods, massage the license terms to make them appear more lucrative than they really are, and then attach a strict confidentiality guarantee to the agreement as well. A patentee who pursues enough of these strategies simultaneously stands a good

⁵³ *E.g.*, *Wyeth v. Organon Pharma Inc.*, No. 09-3235, 2010 WL 4117157, at *4 (D.N.J. Oct. 19, 2010); *Pandora Jewelry, LLC v. Bajul Imports, Inc.*, No. 1:10-CV-135 SNLJ, 2011 WL 976623, at *1 (E.D. Mo. Mar. 17, 2011); *High Point SARL v. Spring Nextel Corp.*, No. 09-2269-CM-DJW, 2011 WL 3241432, at *2 (D. Kan. Jul. 29, 2011); *Clear with Computers, LLC v. Bergdorf Goodman, Inc.*, 753 F. Supp. 2d 662, 664 (E.D. Tex. 2010).

⁵⁴ *E.g.*, *Cornell Research Found., Inc. v. Hewlett Packard Co.*, 223 F.R.D. 55, 67–68 (N.D.N.Y. 2003); *Sprinturf, Inc. v. Sw. Recreational Indus., Inc.*, 216 F.R.D. 320, 322 (E.D. Pa. 2003).

⁵⁵ *E.g.*, *Bayer AG v. Sony Elecs.*, 202 F.R.D. 404, 408–09 (D. Del. 2001); *Centillion Data Sys., Inc. v. Ameritech Corp.*, 193 F.R.D. 550 (S.D. Ind. 1999); *Fenner Invs. Ltd. v. Hewlett-Packard Co.*, No. 608CV273, 2010 WL 1727916, at *3 (E.D. Tex. Apr. 28, 2010) (holding that *ResQNet* does not compel the admission of evidence relating to settlement agreements in prior litigation); *Software Tree, LLC v. Red Hat, Inc.*, No. 609CV097, 2010 WL 2788202, at *4 (E.D. Tex. Jun. 24, 2010).

⁵⁶ *Mondis Tech., Ltd. v. LG Elecs., Inc.*, 2011 WL 1714304, at *5 (E.D. Tex. May 4, 2011).

chance of convincing a court that the license is incomparable or worth more than it might appear.

Patent owners also have incentives to keep licenses confidential from other potential licensing partners, even under circumstances where divulging a license would ordinarily be in both parties' interests. For instance, imagine that a patent owner successfully negotiates a non-exclusive license with Firm A for \$10 million. It then opens negotiations with Firm B, which is similarly situated to Firm A, and seeks royalties in the same amount. If courts did not use licenses to set damages, it would be in the patent owner's interest to divulge the existence and terms of its license to Firm A in the course of negotiations with Firm B. The price of that license would provide a focal point for negotiations with Firm B and might well convince that firm to license on similar terms.⁵⁷ The information revelation would similarly be in Firm B's interests. It might reduce the costs of negotiation and provide information about the activities of Firm B's competitors. More generally, additional information cannot possibly be harmful to Firm B.

But if courts will use licenses to calculate damages, the patent owner has a strong incentive *not* to disclose its prior license to Firm B. Once Firm B observes the \$10 million license between the patent owner and Firm A, it may believe that it faces only \$10 million in potential liability should it lose at trial. If Firm B believes that it has a realistic chance of prevailing at trial, it will only be willing to license the patent for some fraction of \$10 million. (To be precise, as we noted in the preceding part, the value of the license will be discounted by the probability that the patent will be held invalid or not infringed at trial.)⁵⁸

On the other hand, it is possible that courts' use of licensing-based damages will actually encourage settlement in some cases. The reason is that once the patent owner has licensed the patent for the first time, the owner will become more pessimistic about the damages it will likely be awarded at trial. For instance, suppose that Firm B is unaware of Firm A's license. Imagine that the patent owner and Firm B agree that the patent is 50% likely to be valid and infringed, and that a court would likely award \$20 million if the patent owner prevailed at trial. Firm B should be willing to pay $\$20 \text{ million} \times 50\% = \10 million for a license. But if the patent owner knows that the license with Firm A is likely to be divulged at trial, it will understand that its likely damages at trial might actually be $\$10 \text{ million (the license value)} \times 50\% = \5 million . Firm B would be willing to license for any amount less than \$10 million, which is what it (mistakenly) expects to pay at trial; however, the patent owner would be willing to license for any amount greater than \$5 million, which is what it expects to receive at trial.⁵⁹ This opens up \$5 million

⁵⁷ See generally RICHARD H. MCADAMS, *THE EXPRESSIVE POWERS OF LAW* (2015).

⁵⁸ *Supra* Part II; Masur, *supra* note 5, at 129–32.

⁵⁹ Cf. Ben Grunwald, *The Fragile Promise of Open-File Discovery*, 49 CONN. L. REV. (forthcoming 2017) (predicting that criminal cases will be plea bargained—that is, settled—more frequently if defendants gain full knowledge of the strength of the prosecution's case).

in bargaining space.⁶⁰ Under these conditions, the parties are more likely to reach agreement.

Whether courts' misuse of licensing-based damages will encourage or discourage settlement in any given case is therefore highly contextual. But the more general problem with patent licenses being made confidential is that existing, publicly known licenses represent a public good. Even if licenses are not useful in calculating damages, they are potentially very useful as guideposts for other licenses. One of the difficulties in arranging efficient patent licensing is that the terms of existing licenses are often not well known, so parties struggle to find benchmarks for the deals they wish to strike. The result is an increase in the cost of bargaining and a decrease in the number of licensing deals due to bargaining breakdowns.

The more licenses are made public, the greater the benefits to third parties. Some larger firms have attempted to assemble large licensing databases as a means of providing this type of information, but those efforts have been halting and may also be biased by the firm's own interests. As a general matter, it would be beneficial if more licenses became public as a matter of course, or even as a result of litigation. If patent owners respond to the use of licenses to calculate royalties by attempting to hide licenses, the pool of potentially valuable licensing information will diminish.

V. CONCLUSION: PROPOSED REFORM

To avoid the problems created by the licensing-based damages standard, we offer a simple proposal: courts should be extremely careful when using existing licenses to gauge damages, and in most cases they should ignore licenses entirely. Even if the litigated patent has previously been licensed to one or more third parties, the terms of those agreements should generally be considered irrelevant or at most treated as a very weak guide when fashioning a remedy. That is, damages should be assigned through the same calculus employed in cases where there are no prior agreements to use as a baseline. This ensures that remedies are not influenced by expectations about remedies, and that licensing markets will not be distorted by concerns that today's dealings might undermine tomorrow's disputes.

Because judicial reliance on prior licensing agreements is so widespread, we anticipate that some readers will be skeptical of our proposal. At first blush, it may appear to understate the practical complexities that distinguish patent practice from patent scholarship. But any such criticism rests implicitly on one or more fallacious assumptions. The first and most significant fallacy, which we have already exposed

⁶⁰ See Richard A. Posner, *An Economic Approach to Legal Procedure and Judicial Administration*, 2 J. LEGAL STUD. 399 (1973) (describing the settlement bargaining game); see also John P. Gould, *The Economics of Legal Conflicts*, 2 J. LEGAL STUD. 279 (1973) (same); cf. William M. Landes, *An Economic Analysis of the Courts*, 14 J.L. & ECON. 61, 66–69 (1971) (same).

in detail, involves the presumption that prior licensing agreements are likely to provide apt measures of damages. We have demonstrated why, for a number of reasons, this presumption is false. It rests on a naïve and grossly over-simplified conception of patent licensing transactions. It also fails to appreciate the economic complexities that distinguish them from purchases of conventional goods or services, in particular the influence of the courts on the terms of trade. Indeed, even if the relevant commercial circumstances are similar in a prior agreement, it does not follow that the royalty rate negotiated in that agreement would provide a good measure of damages in the next case. The terms of the prior agreement were likely distorted by the parties' uncertainty about litigation, and such concerns have no place shaping the successful plaintiff's recovery.

The second fallacy is often characterized as “looking under the lamppost.”⁶¹ This involves relying on a particular system or practice not because it is likely to be effective, but because it is simple. We have demonstrated that this is precisely what courts are doing when they rely upon previously negotiated licenses. Yet although this approach might economize on judicial decision costs, it is thoroughly misguided. In any normative theory of patent damages, the objective cannot simply be to choose the standard that makes it easiest to come up with a number. Rather, the goal should be to adopt the standard that best serves patent policy interests.

The patent courts have already made it clear that a remedial standard is not appropriate solely on the ground that it is easy. For example, the Federal Circuit recently held that the 25-percent “rule of thumb” is generally not an appropriate standard for computing reasonable royalty damages.⁶² Under the 25-percent rule, courts presumed that reasonable royalties should be set at 25% of the infringer's revenues, absent some indication to the contrary.⁶³ The standard is clearly easy to implement; it is not meaningfully different from a statutory damages rule. But many scholars—particularly economists—derided the standard for its arbitrariness and criticized the courts' apparent disinterest in considering factual issues that shed interest on the proper measure of compensation.⁶⁴ The Federal Circuit agreed, denouncing the rule of thumb as “fundamentally flawed” and generally inadmissible.⁶⁵ The same logic—that the goal of a damages standard is to promote patent policy and not simply to come up with a number—suggests that the

⁶¹ The expression, also referred to as the “streetlight effect,” comes from an old fable. A drunkard is searching for his keys underneath a lamppost. A police officer asks, “Are you sure this is where you lost your keys?” The drunkard replies, “No, but it's easier to look here.” David H. Freedman, *Why Scientific Studies Are So Often Wrong: The Streetlight Effect*, DISCOVER MAG., December 10, 2010, <http://discovermagazine.com/2010/jul-aug/29-why-scientific-studies-often-wrong-streetlight-effect>.

⁶² *Uniloc USA, Inc. v. Microsoft Corp.*, 632 F.3d 1292, 1315 (Fed. Cir. 2011) (“This court now holds as a matter of Federal Circuit law that the 25 percent rule of thumb is a fundamentally flawed tool for determining a baseline royalty rate in a hypothetical negotiation.”)

⁶³ *E.g.*, Thomas Cotter, *Four Principles for Calculating Reasonable Royalties in Patent Infringement Litigation*, 27 SANTA CLARA COMPUTER & HIGH TECH. L.J., 725, 732 (2011).

⁶⁴ *Id.* at 733.

⁶⁵ *Uniloc*, 632 F.3d at 1315.

licensing-based damages standard is not likely to be effective simply because it is practicable. And as we have shown above, the use of an improper standard can create real social costs.

The third fallacy, which is similar, is that a damages standard based on existing licenses is likely to elicit better results because it is more predictable—even if it is wrong. In other words, proponents of this fallacy might argue that a bright-line rule is superior to a standard, even if the rule has a known bias. It is of course true that calculating damages based upon the value of the underlying technology—rather than using existing licenses—will necessarily require some speculation and involve some degree of uncertainty.⁶⁶ Under normal circumstances, this might be a disadvantage given that the goal is to encourage licensing. Typically, the greater the level of certainty over likely outcomes at trial, the greater the likelihood that the parties will be able to reach a settlement—here, a license.⁶⁷ But that is not the case for patent licenses. In this context, certainty about how courts will use licenses—that is, certainty that they will use existing licenses to calculate damages—is precisely what *deters* patent holders from licensing. The more certain an owner is that a court will use a license to calculate future damages, the greater the incentive for the patent owner to obscure the value of the license or refrain from licensing entirely, for all the reasons we detail above.

The uncertainty involved in calculating damages on the basis of the value of the underlying technology—rather than using existing licenses as a guide—is by no means a feature. However, so long as damages are not biased *on average*, patentees will believe that they are likely to receive fair compensation in expectation. Patent owners and putative infringers will have the proper incentives. If damages calculations based upon the value of the technology do turn out to be biased—that is, if they under- or over-compensate on average—then certainly courts should attempt to reform their practices. But it is undeniably better to tolerate some uncertainty in calculating damages than to rely upon a methodology that will reliably generate wrong answers.

The fourth and final fallacy, which is implicit in some potential critiques of our proposal, is that a patent damages standard that relies upon prior licenses will not undermine patent licensing so long as successful plaintiffs appear to be adequately compensated in most final judgments. This type of argument proceeds as follows: among the set of cases that are litigated to judgment, successful plaintiffs seem to get adequate compensation in most cases. Therefore, licensing markets will operate efficiently, because potential-infringers know that they will have to provide sufficient compensation if they refuse to pay an adequate price for a license.

This argument is beset by a selection bias problem. It may be that there is actually much less licensing going on than would be optimal, because patentees—

⁶⁶ See generally Taylor, *supra* note 9.

⁶⁷ George L. Priest & Benjamin Klein, *The Selection of Disputes for Litigation*, 13 J. LEG. STUD. 1 (1984).

wanting to keep their recovery prospects as strong as possible—are refusing to license at anything less than a high royalty rate, even though they could reach additional mutually beneficial agreements on more modest terms.

As we have already noted, one possible exception to our proposal is a patent that has been widely licensed on common terms to many different licensees, as with patents subject to a RAND commitment.⁶⁸ But the standard will be inapt even in these cases if the established royalty was materially affected by pre-litigation uncertainty about whether the patent would be held valid and infringed.⁶⁹ Thus, if the court uses the established royalty as the measure of damages, it allows expectations about the plaintiff’s litigation prospects to influence the remedy.

Patent licensing markets are complex, and there are many variables that determine which terms are mutually beneficial in a particular licensing relationship. The optimal royalty might be higher in one exchange and lower in another. As a consequence, economic efficiency requires that patent holders vary licensing terms among different transactions so as to maximize the number of mutually beneficial deals that are reached. But this paper demonstrates that the courts unwittingly discourage this kind of efficient discrimination when they base patent damages on prior licensing agreements involving the litigated patent. This tethers patent holders to the terms of their private dealings, leaving them wary of accepting anything less than a high royalty rate, even if this means foregoing many mutually beneficial licensing opportunities that could be reached only on more modest terms. While administratively convenient in the small number of cases that are actually litigated to judgment, it creates problems in virtually all patent licensing, and thus substantially undermines the efficient commercialization of patented inventions. Eradicating the licensing-based damages standard would benefit not only patent holders, but also prospective licensees and their consumers.

⁶⁸ See *supra* note 20.

⁶⁹ As noted earlier in Section III, since the parties have litigated the dispute to judgment, it is probably safe to infer that there was significant pre-judgment uncertainty. One might counter that the present dispute may have involved some uncertain elements that were not present in the prior agreement. For example, perhaps the defendant’s product is different from those of nonparty licensees, and the infringement question is less obvious here. But, of course, such distinctions cast doubt on the comparability of the prior licensing deals.