

**COMMENTS ON *PATENT REMEDIES*
AND COMPLEX PRODUCTS—
A U.S. LITIGATION PERSPECTIVE**

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Patent Remedies and Complex Products: Toward a Global Consensus comprises a laudable and impressive effort to examine the underpinnings of patent remedies and how these remedies should be applied in our world of ever more advanced multicomponent products. This Comment provides some reactions to and amplifications of the valuable contributions of *Patent Remedies and Complex Products* from the perspective of U.S. patent and antitrust litigation. More specifically, this Comment focuses on several critical aspects of the calculation of reasonable royalties and injunctive relief, particularly as to standard-essential patents (SEPs).

I. REASONABLE ROYALTIES IN GENERAL

Patent Remedies and Complex Products advances as one of its principal recommendations a proposal to collapse the *Georgia-Pacific* factors into a three-step methodology: (1) calculate the “incremental value” the implementer derives or expects to derive from the use of the invention and divide it appropriately between the parties; (2) assess market evidence (comparable licenses); and (3) compare the results of steps 1 and 2. In the proposed methodology, if there is evidence available for step 2, but not for step 1 (as admittedly will often be the case), then steps 1 and 3 become moot, and the methodology reduces to step 2. Similarly, if there is evidence for step 1 but not for step 2, the methodology reduces to step 1.¹

As the book correctly notes, there are a number of thorny issues with this proposed methodology. But the challenges may be even greater in practice than what the book describes. “Incremental value” is a term that on the one hand may have some superficial appeal, but on the other hand may raise more problems

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1. Thomas F. Cotter et al., *Reasonable Royalties*, in *PATENT REMEDIES AND COMPLEX PRODUCTS: TOWARD A GLOBAL CONSENSUS* 6, 16–17 (C. Bradford Biddle et al. eds., 2019) [hereinafter *PATENT REMEDIES AND COMPLEX PRODUCTS*].

than it solves. For example, the term has been given different meanings in different contexts. In *Ericsson v. D-Link*, the U.S. Court of Appeals for the Federal Circuit addressed the need, in calculating reasonable-royalty damages, to apportion value among patented and unpatented features. The court stated, “The essential requirement is that the ultimate reasonable royalty award must be based on the incremental value that the patented invention adds to the end product.”² In context, the term “incremental value” in *Ericsson* refers to the value contributed to an end product by a patented feature, as distinguished from other, unpatented features. This might be thought of as the inherent value of the feature, or simply its apportioned value.

Patent Remedies and Complex Products defines “incremental value” as “the economic value of a patented technology to an implementer,” which is “the (actual or expected) profit or cost saving the implementer derives from the use of the patented technology over the next best available noninfringing alternative.”³ This is a different concept from the meaning implicitly given to the term in *Ericsson* (which did not discuss available noninfringing alternatives). And the book’s definition is itself susceptible to multiple interpretations. Using cost as the basis for determining incremental value can lead to very different results than would be reached using profit as the starting point. For example, it might be more costly to implement a solution based on a new and technologically superior invention, as compared to using the next best (old) approach. So, if one were to determine the incremental value of the new invention based on cost, it would have a negative value—hardly a sensible result. Now let us suppose that the new invention is both cheaper to implement and more effective for its intended purpose than prior approaches, leading to greater sales to consumers. Should the new invention be valued based on the cost savings or the increased profit? And what happens if there is no available noninfringing alternative that could be substituted into the relevant end product? The incremental value is undefined in that situation and arguably could be equal to the entire value of the end product, which might not be possible without the patented invention.

Another difficulty with incremental value as a guidepost for patent infringement damages involves the level of the supply chain at which one assesses the royalty. In other words, if we suppose the value of an invention to be the profit that the implementer derives from the use of the patented technology over the next best available noninfringing alternative, which implementer is the relevant one to consider? Is it the maker of the smallest component that practices the invention, the maker of an end-use device that incorporates that component, or someone else? Some would say that the answer is obviously the smallest component. But suppose that the makers of that component compete in a commoditized market, so that their selling prices are barely above their costs, while the end device makers sell highly differentiated, high-margin products and profit handsomely from the use of the invention. In such a case, wouldn’t the value of the invention to society lie in the value of the end device to consumers? Imagine,

2. *Ericsson, Inc. v. D-Link Sys., Inc.*, 772 F.3d 1201, 1226 (Fed. Cir. 2014).

3. Cotter et al., *Reasonable Royalties*, *supra* note 1, at 19.

for example, a patented invention that is implemented in a cellular baseband processor chip that sells for, say, \$25. Suppose that chip is used in a tablet that retails for around \$450, while a noncellular version of the same tablet retails for around \$320. Is the value of the invention more closely related to the chipmaker's profit (likely in low single digit dollars) or to the additional profit the tablet maker makes on the cellular version of the tablet (likely north of \$100 in this hypothetical). In this case, where the value to consumers of cellular connectivity is plainly at least \$130, it would make little sense to argue that the value of the invention is limited by the profit obtained by the chipmaker. If innovators are forced to recover royalties exclusively upstream at the component level, they may be seriously undercompensated for the work of advancing hard-to-understand, unglamorous technological boundaries, while the makers and marketers of shiny new devices are overcompensated—owing to a misconceived policy.

Perhaps most importantly, it is far from clear that the incremental value (as defined in *Patent Remedies and Complex Products*) of a patented invention can ever be isolated and quantified in practice.⁴ For relatively simple⁵ products, such as a new active ingredient for a drug, a new textile fiber, or a new material for artificial knees, it may be straightforward to associate the invention with increased sales and displacement of older products in the marketplace. In such cases the value of the invention over the next best alternative is readily apparent. But in complex, multicomponent products, the inventions tend to be rather arcane and often are buried in the innards of a device. Such features, even if very important to the functioning of the overall device, are usually not traded in any market and do not have prices associated with them. In fact, it can be quite difficult or impossible to identify alternative technologies. This is particularly so because one often cannot simply lift a feature out of a complex product and swap in a different feature. Altering or replacing one feature could require changes to other features, which could require modification of still other features, and so on. Moreover, in the context of industry standards, it is often the case that solutions to technical problems are developed over time. In the process, a single solution may advance through the standardization process while other potential solutions are abandoned as unworkable or suboptimal. In that circumstance it may be that there is no viable alternative. Thus, in many cases involving complex technologies, the incremental value (as defined in *Patent Remedies and Complex Products*) of an individual patented invention may be effectively unknowable. Indeed, it is unclear whether there are any cases in which such a value has been reliably computed; *Patent Remedies and Complex Products* does not cite any.

4. As Judge Robart commented, the incremental value approach is flawed in “its lack of real-world applicability” and “its impracticability with respect to implementation by courts.” *Microsoft Corp. v. Motorola, Inc.*, No. C10-1823JLR, 2013 WL 2111217, at *13 (W.D. Wash. Apr. 25, 2013).

5. This is not in any way to disparage such products and innovations, or their tremendous value. Rather, the point is that in products having relatively few components, it is often much easier to draw a direct line from a single, specific patented innovation to increased sales and changes in the marketplace.

As the book concedes, the proposed methodology will likely boil down to market evidence—essentially comparable licenses. This is a very sensible place to land because, in practice, comparable licenses are by far the best and most practical evidence of value. *Patent Remedies and Complex Products* notes some theoretical issues that could potentially arise with comparable licenses (including “circularity” and “dynamic considerations”). For practical purposes, such concerns are too abstruse to warrant much attention in court. Litigants and courts face sufficient challenges in grappling with first-order differences among licenses. These include whether a proposed comparable license covers exactly the same patent(s) in suit, different license terms, and differences in the circumstances of licensees. As *Patent Remedies and Complex Products* aptly notes, the entire hypothetical bargain framework is merely a “device in aid of justice, by which that which is really incalculable shall be approximated.”⁶ A quest for “accuracy” in damages is bound to fail at some level. Given that one cannot generally expect to calculate the incremental value of a patented invention, factfinders usually need to rely on comparable licenses. Factfinders should not be overly concerned with searching for perfectly comparable licenses (and thus ignoring reasonably close but somewhat distinguishable licenses). Rather, they should eliminate outliers and seriously noncomparable licenses and then focus on making sensible adjustments to the licenses that remain.

Given the difficulties with incremental value as a metric and the practical primacy of comparable licenses, the utility of *Patent Remedies and Complex Products*’s three-step methodology is open to question. The methodology puts unwarranted emphasis on an impractical ideal. It would be preferable to focus on the available market evidence provided by comparable licenses—which provide real-world evidence of both the value of the relevant invention(s) and the appropriate division of that value between innovator and implementer.

One final difficulty with the proposed methodology involves what to do when there is no evidence for *either* step 1 *or* step 2—that is, when incremental value cannot be calculated *and* there are no comparable licenses. Such a situation could arise, for example, in a case involving a radically new technology or a new player in the market. It also could arise in the more prosaic case where litigants succeed in discrediting each other’s proposed comparable licenses. The virtue of the *Georgia-Pacific* framework is its open-ended flexibility. *Patent Remedies and Complex Products* raises the question of whether there could be a better framework. Further research and consideration along this line would be appropriate. Perhaps additional work could identify improved ways to compare disparate licenses and to address situations where comparable licenses are not available.

6. Cotter et al., *supra* note 1, at 26 (quoting Judge Learned Hand).

II. THE EFFECT OF FRAND COMMITMENTS

A. Methodologies for Determining FRAND Royalties

Patent Remedies and Complex Products provides a helpful review of the effect of FRAND commitments on patent remedies. The authors of Chapter 5 correctly note that the concept of a “reasonable royalty” in U.S. patent infringement damages law on the one hand, and the concept of FRAND terms and conditions under standards-development organization (SDO) policies on the other hand, really have nothing to do with one another.⁷ The origins of these concepts are entirely unrelated. Their purposes likewise differ. One is a creature of a U.S. statute and U.S. judicial decisions; the other is contractual in nature and, depending on the SDO, may not be governed by U.S. law.⁸ Nevertheless, as the chapter notes, U.S. cases involving FRAND royalties have tended to rely on the law of patent infringement damages for guidance, probably for the simple reason that the *Georgia-Pacific* framework is familiar and seems generally applicable.⁹

In addition to the *Georgia-Pacific* framework, *Patent Remedies and Complex Products* also identifies the “top-down” approach that the court employed in *Innovatio*, which it describes as a “promising alternative.”¹⁰ The top-down approach, however, is based on an unfounded assumption, and contrary to Federal Circuit precedent. The motivation behind the top-down approach is that courts must guard against “the risk of royalty stacking.”¹¹ But, as discussed further below, royalty stacking is a theoretical concern that remains entirely unsubstantiated by real world evidence. Recognizing the theoretical nature of royalty stacking, the Federal Circuit held in *Ericsson v. D-Link* that a jury “need not be instructed regarding royalty stacking unless there is actual evidence of stacking.”¹² The court subsequently stated that “abstract recitations of royalty stacking theory, and qualitative testimony that an invention is valuable—without being anchored to a quantitative market valuation—are insufficiently reliable.”¹³

Patent Remedies and Complex Products correctly notes that the top-down approach “is not without its challenges.”¹⁴ The book points out that “there is not yet a uniformly accepted methodology for determining the aggregate royalty level for all patents covering a particular standard.”¹⁵ In truth, it would be more accurate to say that there is no methodology at all. The cases that have employed

7. Jorge L. Contreras et al., *The Effect of FRAND Commitments on Patent Remedies*, in *PATENT REMEDIES AND COMPLEX PRODUCTS*, *supra* note 1, at 160, 167.

8. The ETSI IPR Policy, for example, is expressly governed by French law.

9. Contreras et al., *supra* note 7, at 167.

10. *Id.* at 168.

11. *Id.* (quoting *Innovatio*).

12. *Ericsson, Inc. v. D-Link Sys., Inc.*, 773 F.3d 1201, 1234 (Fed. Cir. 2014).

13. *Commonwealth Sci. & Indus. Research Org. v. Cisco Sys., Inc.*, 809 F.3d 1295, 1302 (Fed. Cir. 2015).

14. Contreras et al., *supra* note 7, at 170.

15. *Id.*

the “top-down” analysis have generally relied on admissions from the patent holder, taken from some unrelated context, to the effect that the patent holder thought aggregate royalties for the relevant standard should be no more than X%. This heuristic has figured prominently, not only in the *Unwired Planet* and *Apple Japan* cases as the book notes, but also in *TCL v. Ericsson*.¹⁶ Reliance on the patent holder’s past statements is tempting, as it is a convenient shortcut allowing a court to reach a decision. But it is a dubious choice, as a policy matter, given that it has little basis in fact and no basis in economics. Effectively, the top-down approach puts the court in the position of a central planner deciding what value to assign to a potentially broad swath of an industry’s technology, based on what one party once proposed.

In *Innovatio* itself, the court adopted the average profit margin on Wi-Fi chips as the starting point for its top-down analysis.¹⁷ But this too amounts to no more than a convenient shortcut, without a foundation in economics. There is no economic basis to suppose that the cost of a necessary input, such as IP rights, is limited by a profit margin on the relevant product established *without accounting for all the costs*. It would make no sense, for example, for an automaker to say “we only expect a profit margin of \$1000 per car, therefore we can’t pay more than \$1000 for the engine.” The profit is calculated *after* paying for all the costs of production and pricing the end product based on those costs. A firm’s profit may be more or less than the cost of any individual input.

B. Inapplicability of Incremental Value

Under the general heading of FRAND royalties, there is also a broader issue that warrants discussion: if, as *Patent Remedies and Complex Products* finds, the U.S. patent damages concept of a “reasonable royalty” is not determinative as to what constitutes a permissible royalty under a FRAND obligation, what is the right standard (if any)? For all the reasons discussed above, “incremental value” is not a useful standard for determining the value of a patented invention. And, in the FRAND context, it may well be a pernicious one.

Arguments in favor of “incremental value” as the measure of royalties start with a fundamental misconception. In the context of industry standards, it is often asserted that patented technologies compete with one another for inclusion in the ultimate standard.¹⁸ The assumption, apparently, is that SDOs conduct a sort of “beauty contest” in which some patents are judged to be slightly better than others, or slightly cheaper, and then choices are made as to which patents to put into the available slots in the standard.

16. *TCL Comm’n Tech. Holdings Ltd. v. Telefonaktiebolaget LM Ericsson*, 943 F.3d 1360, 1367–69 (Fed. Cir. 2019) (applying a modified version of TCL’s proposed “top-down” approach, which determined the maximum aggregate royalty level by looking at “Ericsson’s own public statements about what [the] ceiling rate should be. . . prior to ETSI’s adoption of each standard”).

17. *In re Innovatio IP Ventures, LLC Patent Litig.*, No. 11 C 9308, 2013 WL 5593609, at *38 (N.D. Ill. Oct. 3, 2013).

18. *See, e.g., Cotter et al., supra* note 1, at 21.

In two decades of litigating SEP cases, I have never seen any evidence of this sort of procedure. The FTC's administrative case against Rambus provides an important counter example. In that case proof of the existence of technological alternatives would have been critical. Yet the FTC failed to prove that any alternatives in fact existed or would have been chosen in the absence of Rambus's alleged misconduct.¹⁹

In fact, the development of a new standard starts with setting certain high-level objectives. Then innovators endeavor to solve a plethora of tough engineering challenges in a quest to achieve those objectives. The innovators present their solutions (not patents) to gatherings of hundreds of engineers from an array of participating entities (which may include companies, universities, government agencies and interested individuals). After much debate, study, and refinement, a consensus coalesces around a given solution or set of solutions to an aspect of the overall problem. The collection of all the consensus solutions for all aspects of the project becomes the standard.²⁰ Neither patents nor individual patented inventions are typically discussed in this process.

In short, in the context of standards and SEPs, the idea of the incremental value of one patented invention over the next best alternative has little or no practical application. Standards development bears a strong resemblance to a joint venture or joint development project, in which a number of participants contribute their efforts to develop technologies specifically for the venture. In cellular standards, for example, the bulk of that development work is done by a relatively small number of firms. The leading SDO in cellular, ETSI, has over 900 members. But the vast bulk of the work in developing a new cellular standard, such as 3G, 4G or 5G, is done by fewer than ten firms.²¹ These firms, effectively, act as an R&D resource for the entire industry. They do so with the expectation that they will be able to profit from their investment, at least in part, by charging patent royalties to other firms who make end-use devices. Those device makers often contribute little or nothing to the development of a standard, but reap the benefits of that standard by selling devices to consumers.

This is the implicit bargain, instituted by custom and practice over the course of the last three decades, that drives innovation in the cellular industry. The ability of upstream innovators to earn a share of the profits on end devices, through patent royalties, has enabled the industry to thrive and grow exponentially. A focus on the incremental value of individual patents threatens to undermine this arrangement, leading to undercompensation of innovation and a predictable slowing of technological progress, to the detriment of all.

19. See *Rambus Inc. v. Fed. Trade Comm'n*, 522 F.3d 456, 466–67 (D.C. Cir. 2008).

20. See Kirti Gupta, *How SSOs Work: Unpacking the Mobile Industry's 3GPP Standard*, in THE CAMBRIDGE HANDBOOK OF TECHNICAL STANDARDIZATION LAW: COMPETITION, ANTITRUST, AND PATENTS 29, 33–41 (Jorge L. Contreras ed., 2018) (“The formation of technology standards is not about selecting between equally suitable technical alternatives but about firms cooperatively creating new technical solutions where none existed prior to the articulation of the new problem (or requirement) to solve the problem.”); *Standards Making*, ETSI, <https://www.etsi.org/standards/standards-making> [<https://perma.cc/37QA-E7TV>] (delineating ETSI's standard making process that is “based on consensus”).

21. See Gupta, *How SSOs Work*, *supra* note 20, at 41.

The problem is exacerbated if (a) incremental value is calculated as the value to a manufacturer who uses the patented inventions to make lower-priced, upstream components, rather than a manufacturer who incorporates the technologies into higher-priced consumer devices, or (b) innovators are prohibited from collecting royalties or damages based on the value of standardization. The point of participating in the development of a standard is to profit from the commercialization of that standard. There is no economic justification for the belief that those who contribute their time, effort, resources and innovation to the technological development of a standard should not share in the benefits of standardization. Nor is there any basis to believe that those who make end-use products should appropriate all the value of upstream innovators' work for themselves. The economically sound result would entail a bargained-for division of those benefits. *Patent Remedies and Complex Products* refreshingly appears to recognize these types of concerns by advocating for a hypothetical negotiation framework that would allow the incorporation of *ex post* information.²²

C. Portfolio Licensing

Another important aspect of standards development is that it entails innovative efforts on a large scale by at least some of the participants. This can result in extensive portfolios of SEPs, numbering in the thousands worldwide. With such large numbers of patents potentially at issue in a licensing dispute, it is impossible to envision litigating each individual patent, patent by patent, country by country. As Justice Birss noted in *Unwired Planet*, this would be “madness.”²³ Even *negotiating* (as opposed to litigating) patent by patent is wildly impractical. Commercial counterparties thus, almost universally, make the pragmatic choice to negotiate worldwide portfolio licenses.

It stands to reason then that a worldwide portfolio license is perfectly consistent with FRAND obligations.²⁴ Moreover, in any royalty dispute between an innovator and an implementer in the standards context, the presumptive end goal will be to reach a settlement including a worldwide portfolio license. But, at least in U.S. litigation, there does not seem to be a practical way for a court to decide the terms of such a license, absent consent of the parties to have the court make such a determination.²⁵

22. Cotter et al., *supra* note 1, at 30–33.

23. *Unwired Planet Int'l Ltd. v. Huawei Techs. Co. Ltd.* [2017] EWHC (Ch) 711 (Pat) (Apr. 5, 2017), *aff'd* [2018] EWCA (Civ) 2344 [¶ 38] (Eng.).

24. *See, e.g., id.* [¶ 56] (“[A] global licence between a SEP owner and an implementer may be FRAND.”); [¶ 117] (court-settled global license is FRAND); Landgericht [LG] [Düsseldorf District Court] Mar. 31, 2016, 4a O 73/14, *Saint Lawrence v. Vodafone (Ger.)* (providing that if patent portfolios are usually covered by worldwide licenses in the relevant market, a worldwide portfolio license will be FRAND under most circumstances).

25. *See Apple Inc. v. Qualcomm Inc.*, No. 3:17-cv-00108-GPC, 2017 WL 3966944, at *9 n.5 (S.D. Cal. Sept. 7, 2017) (noting the argument that a court does not have authority to adjudicate a FRAND determination unless the parties consent to be bound); *InterDigital Commc'ns Inc. v. ZTE Corp.*, No. 1:13-CV-00009-RGA, 2014 WL 2206218 at *3 (D. Del. May 28, 2014) (refusing to hold a trial to determine a FRAND rate because the parties did not consent to be bound to the determination and observing that it is “unclear as to how [the court] could actually enforce a ruling”); *Apple*

These issues should impact the remedies available in FRAND litigation. In *Unwired Planet*, the U.K. Patents Court fashioned an innovative solution to the “madness” of country-by-country, full-portfolio litigation. After finding that Huawei infringed one of Unwired Planet’s U.K. patents, the court found that an injunction was appropriate. The court further found it appropriate to order that the injunction would be lifted if Huawei agreed to take a worldwide portfolio license on FRAND terms prescribed by the court.²⁶ This solution neatly side-steps the issue of consent. The court plainly had the power to enjoin use of the patented invention in the United Kingdom. And Huawei was not *forced* to sign a license, but it could choose to sign a license as the price of lifting the U.K. injunction.

Though the *Unwired Planet* decision raised a number of challenging legal questions (and Huawei’s appeal to the U.K. Supreme Court remains pending), the result seems a salutary one. The alternative of worldwide, patent-by-patent litigation is extremely burdensome and wasteful. In the realm of commercial disputes, courts exist to resolve parties’ differences so that they can get on with business. In the absence of any tribunal that can resolve FRAND licensing disputes, the parties have little choice but to pummel each other until one side or the other says “uncle.” It makes far more sense to provide a forum where parties can litigate the real dispute—what terms would be FRAND for a particular patent portfolio—rather than launching multiple individual patent cases, no one of which is likely to force a settlement.

III. HOLDUP, ROYALTY STACKING AND HOLDOUT

A. Holdup and Royalty Stacking

For years advocates for standards implementers have been arguing that patent holdup presents a particular problem in connection with industry standards. This hypothesized danger has been cited repeatedly as the justification for governmental policies and even judicial decisions, notwithstanding the Federal Circuit’s admonition that allegations of holdup must be backed up with “actual evidence.”²⁷ Many advocates also take as an article of faith that royalty stacking is a serious problem imperiling implementers and even whole industries. Mark A. Lemley and Carl Shapiro gave these theories an air of academic legitimacy with their article, *Patent Holdup and Royalty Stacking*.²⁸ But is there any real-world evidence of the holdup and royalty stacking bogeymen?

Inc. v. Motorola Mobility, Inc., No. 11-CV-178-BBC, 2012 WL 5416931, at *1 (W.D. Wis. Nov. 2, 2012) (questioning whether it would be proper for a court to “undertake the complex task of determining a FRAND rate” if the parties do not consent to be bound by the determination).

26. *Unwired Planet Int’l Ltd.*, [2018] EWCA 2344 at [¶ 289].

27. *Ericsson, Inc. v. D-Link Sys., Inc.*, 773 F.3d 1201, 1234 (Fed. Cir. 2014).

28. See generally Mark A. Lemley & Carl Shapiro, *Patent Holdup and Royalty Stacking*, 85 TEX. L. REV. 1991 (2007).

Patent Remedies and Complex Products takes on this important question. After reviewing the evidence, coauthor Norman Siebrasse finds that “there is little evidence that holdup and royalty stacking are systemic problems.”²⁹

As to holdup, the evidence to support the theory is quite thin indeed. Lemley and Shapiro themselves cited the *Rambus* litigation. But, as Siebrasse notes, they simply misunderstood the facts of that case.

Siebrasse finds “more persuasive” their second example, Research in Motion’s (RIM’s) settlement with NTP, Inc.³⁰ In that case, NTP prevailed in its infringement litigation against RIM, and was awarded an injunction. To be sure, RIM settled for what many saw as an exorbitant sum. However, two points not raised by Siebrasse should be mentioned. First, NTP was a classic nonpracticing entity. In fact, the *NTP* case may be seen as the high-water mark of the “patent troll” scourge, before the tide turned against them. Second, *NTP* predated the Supreme Court’s *eBay* decision. In *eBay*, the Court held that there is no “general rule” in favor of injunctive remedies for patent infringement. Instead, courts must evaluate requests for injunctions using a four-factor equitable test.³¹ After *eBay*, patent holders have found it markedly more difficult to obtain injunctions. If *NTP* had been decided after *eBay*, the district court likely would not have awarded an injunction to the plaintiff.³² In short, the *NTP* example demonstrates that in the pre-*eBay* world, a nonpracticing entity, unconstrained by any concern about participating in the relevant industry after its litigation ended, could extract a large settlement. But that one case should not be seen as proof that patent holdup is common or to be expected absent those rather unique conditions.³³

Microsoft v. Motorola, Siebrasse posits, is another example that could be “suggestive” of holdup. But the argument there is merely that Motorola *sought* a royalty of 2.25 percent on Xboxes. As Motorola was not successful in obtaining such a royalty, it is difficult to see this as an example of actual holdup. Merely seeking a “high” royalty does not mean that the patent owner will recover an unduly high amount. And a rule against asking for too much would be untenable and an abridgement of litigants’ First Amendment right to seek redress of grievances in court. After all, if Motorola had succeeded in substantiating its claim for a 2.25 percent royalty, no one would be discussing holdup. We would be talking about how valuable Motorola’s inventions are and how Microsoft should have taken a license earlier.

29. Norman V. Siebrasse, *Holdup, Holdout and Royalty Stacking: A Review of the Literature*, in PATENT REMEDIES AND COMPLEX PRODUCTS, *supra* note 1, at 239, 302.

30. *Id.* at 295 (discussing *NTP, Inc. v. Research in Motion, Ltd.*, 270 F. Supp. 2d 751 (E.D. Va. May 23, 2003)).

31. *eBay Inc. v. MercExchange, L.L.C.*, 547 U.S. 388, 391–94 (2006).

32. Norman V. Siebrasse et al., *Injunctive Relief*, in PATENT REMEDIES AND COMPLEX PRODUCTS, *supra* note 1, at 115, 127–28 (discussing principles in *eBay*).

33. Some advocates have relied on Lemley and Shapiro to stoke fears of anticompetitive risks related to SEPs. *Patent Remedies and Complex Products* decidedly does *not* fall into this camp. But it is still worth pointing out that *NTP* was not a standards case. And it is interesting that the best example Lemley and Shapiro could cite of patent holdup did not involve SEPs.

In short, it is difficult to find any actual examples of patent holdup in relation to an industry standard. Siebrasse's conclusion that "there is little evidence" may have been charitable.

As for claims of royalty stacking, the evidence is even weaker. Lemley and Shapiro cite 3G cellular technology as one purported example. They note that one source (Bekkers and West) "suggests" that the total royalty stack for internet-enabled phones was "in the range of 20% . . . of the entire phone."³⁴ But the Bekkers and West reference is dubious, as it merely listed 20% in a table as the "estimated total royalty," without analysis or attribution. Another source (Thelander) is cited as placing the number at 22.5% for 3G WCDMA technology, plus 15–20% for 2G GSM technology, for a total of 37.5–42.5%.³⁵ But this was a nonpublic source at the time and is unavailable today. From the outset, the claim of royalty stacking was flimsy at best.

More recently, Galetovic, Haber, and Zaretzki³⁶ undertook an in-depth analysis of patent royalties for mobile phones. These researchers took a "follow the money" approach. Royalties paid by licensees are received as revenue by licensors, and many of those licensors report their revenues publicly. The number of mobile phones sold worldwide and their average selling prices are also available, as they are reliably estimated by a number of data providers. Using this revenue and sales data, it is possible to estimate the average cumulative royalty paid by mobile phone manufacturers. This analysis results in an estimate of the average cumulative royalty of just 3.3%.³⁷

Further substantiating their work, this estimate broadly agrees with a recent disclosure of actual industry information from litigation. One of the most vocal advocates on the supposed dangers of royalty stacking over the years has been Apple. In the recent litigation brought by the U.S. Federal Trade Commission against Qualcomm, an Apple witness testified that Apple paid Qualcomm about \$7.50 in royalties per iPhone. That same witness testified that \$7.50 was "more than everybody else put together."³⁸ In other words, during the relevant time period, Apple paid less than \$15 per iPhone to all licensors combined. In percentage terms, for a \$1000 iPhone,³⁹ Apple pays less than 1.5% in cumulative royalties.

This is not to say that royalties could never be unreasonable or excessive, or that a "stack" of royalties could never grow too large. But no one has come

34. Lemley & Shapiro, *supra* note 28, at 2026 (citing Rudi Bekkers & Joel West, *The Effect of Strategic Patenting on Cumulative Innovation in UMTS Standardization* 22 (Dynamics of Insts. & Mkts. in Eur., Working Paper No. 9, Mar. 2006), <http://ipr.dime-eu.org/node/144>).

35. *Id.* at 2027 (citing Michael W. Thelander, *The IPR Shell Game*, SIGNALS AHEAD, June 6, 2005, at 1, 7).

36. Alexander Galetovic et al., *A New Dataset on Mobile Phone Patent License Royalties* 3–5 (Hoover IP2 Working Paper No. 16011, 2016), <http://hooverip2.org/wp-content/uploads/ip2-wp16011-paper-original.pdf> [<https://perma.cc/GJ9U-8L4E>].

37. *Id.* at 11.

38. Fed. Trade Comm'n v. Qualcomm Inc., 411 F. Supp. 3d 658, 784 (N.D. Cal. 2019).

39. iPhone prices currently range from about \$449 to about \$1499. *iPhone Price Trackers*, MACPRICES.NET, https://www.macprices.net/iphone_prices.shtml [<https://perma.cc/9A92-SAHX>].

forward with a factually supported example. In *Ericsson v. D-Link*, the U.S. Court of Appeals for the Federal Circuit held that a jury in a FRAND royalties case may consider royalty stacking only when there is “actual evidence of stacking.”⁴⁰ Actual evidence of a real risk of royalty stacking will be difficult, if not impossible, to come by.

B. Holdout

Holdout occurs when an implementer opts for a “catch me if you can” strategy, forcing a patent holder to litigate, perhaps repeatedly, rather than voluntarily taking a license. In a climate where injunctive relief and enhanced damages are unlikely to be awarded, the implementer can pursue this strategy, potentially forcing years of delay and millions of dollars in costs on the patent holder. In the end, the implementer’s worst case scenario is that it will have to pay the FRAND royalty that it should have agreed to in the first place. Holdout thus can be used by implementers to drive up a licensor’s costs, drive down its expected recovery, and force lower royalty settlements.

Siebrasse acknowledges holdout as a possible justification for injunctive relief as a deterrent and to level the playing field. He outlines some of the arguments for and against that view. He concludes that the argument for the availability of injunctions is “most powerful when *ex ante* licensing is feasible.”⁴¹ In other words, if an infringer could have taken a license prior to some relevant date,⁴² but instead opts for a burdensome, patent-by-patent fight, an injunction may be an appropriate solution.

There is, however, another, significant issue related to holdout that is not discussed in *Patent Remedies and Complex Products*. As noted above, innovators who develop complex industry standards invest tremendous resources in those efforts, in anticipation of reaping rewards in terms of patent royalties from sales of standard-compliant end products. And some of those innovators generate extensive, worldwide patent portfolios to lay claim to their rights to collect such royalties. In the cellular industry, as an example, the custom and practice for many years has been for device makers to sign licenses with SEP holders and pay royalties at well-known rates.

For an implementer to play “catch me if you can” in these circumstances is highly problematic. After an innovator has made massive investments in developing a new standard, an implementer following the holdout strategy can effectively say, “I’m not paying what you ask, and in fact I will only pay damages that are awarded after you prove infringement of a valid, enforceable patent.” For an innovator with thousands of SEPs, this presents an almost insurmountable problem. It would be impossible to litigate thousands of patent infringement

40. *Ericsson, Inc. v. D-Link Sys., Inc.*, 773 F.3d 1201, 1234 (Fed. Cir. 2014).

41. Siebrasse, *supra* note 29, at 289.

42. It is unclear in this context whether the term *ex ante* refers to a time prior to the development of the standard, prior to its adoption, prior to the infringement, prior to the implementer making substantial investments in practicing the standard, or some other time. Picking a relevant date could be problematic for a number of reasons that are beyond the scope of the Comment.

cases. Even pursuing a smaller number of cases, in multiple countries, could be extremely burdensome and could take years.⁴³ And if the patent holder succeeds in establishing liability under a single patent, the damages will naturally be limited to the infringement of that one patent and are likely to be comparatively small. A well-heeled implementer could afford to suffer a number of such losses and continue fighting and imposing costs on the patent holder. Even a string of multiple damages awards might not get the patent holder close to the royalty it deserves for a portfolio of thousands of patents.

The implementer in such a situation likely would argue that it has the legal right to fight every patent, cannot be required to pay for patents it has not been shown to infringe, and cannot be compelled to sign a license against its will. And it would have a point—to a degree. But in reality, the implementer in this situation is leveraging the unfortunate fact that commercial dispute resolution is neither quick nor cheap, and therefore patent holders cannot easily secure compensation. Implementers can use this fact to force patent holders into a situation where they are undercompensated. From a societal perspective, this is an inefficient and undesirable situation. It would be far preferable to have a mechanism for resolving the parties' actual dispute—what is the value of a license to the at-issue portfolio of patents—and for the outcome of that mechanism to be enforceable.⁴⁴ While Justice Birss's decision in *Unwired Planet* provides an ingenious solution to the problem, this remains a fertile area for further research as to appropriate remedies for patent infringement.



Patent Remedies and Complex Products delivers important contributions of critical thought in an area of urgent concern at the crossroads of law, economics and policy. Building upon this strong foundation, further work with regard to the calculation of infringement damages, as well as remedies in relation to SEPs, will be most welcome.

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43. In *Apple v. Qualcomm*, the battle expanded to include over 80 separate actions on three continents before it was finally settled. Reed Albergotti, *Apple and Qualcomm Have Settled Their Epic Lawsuit Over Chip Patents*, WASH. POST (Apr. 16, 2019, 12:26 PM), <https://www.washingtonpost.com/technology/2019/04/16/apple-qualcomm-face-off-epic-courtroom-drama> [https://perma.cc/P3PC-Z749].

44. *Unwired Planet Int'l Ltd. v. Huawei Techs. Co.*, [2018] EWCA (Civ) 2344 (Eng.) [¶ 54] (“[Innovators] are entitled to an appropriate reward for carrying out their research and development activities and for engaging with the standardisation process, and they must be able to prevent technology users from free-riding on their innovations. It is therefore important that implementers engage constructively in any FRAND negotiation and, where necessary, agree to submit to the outcome of an appropriate FRAND determination.”)