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THE BROKEN BALANCE: HOW "BUILT-IN APPORTIONMENT" AND THE FAILURE TO APPLY *DAUBERT* HAVE DISTORTED PATENT INFRINGEMENT DAMAGES

William F. Lee & Mark A. Lemley***

ABSTRACT

The United States patent system is designed to be a balance: in exchange for the inventor disclosing their invention to the public, patentees are granted exclusive rights to that invention for a period of time. This ensures that patentees are adequately compensated for their innovation and society at large benefits from the patent's disclosure. This balance is now broken. Over recent years, patentees — particularly non-practicing entities — have been permitted to seek and recover unreasonable damages that stretch far beyond the value of the technology they invented. This has had serious and negative consequences: excessive patent damages discourage innovation, increase risk and cost of production, and, in turn, increase the cost of products to consumers.

Patent law has a solution to this broken balance: apportionment. This principle, which dates back to the nineteenth century, holds that damages must be limited to the value of just the patented invention and cannot capture the value of other features or technology. When applied as intended, apportionment ensures the patent balance — patentees recover the value of what they invented but no more. But therein lies the problem: in recent years, many courts have been backsliding from the principle of apportionment. First, some courts have permitted plaintiffs to rely on "built-in apportionment" to bypass apportionment entirely. Second, some courts have failed to properly apply *Daubert* and Federal Rule of Evidence 702 to exclude unreliable apportionment theories, particularly where experts purport to use regressions or conjoint survey analysis.

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* Partner, Wilmer Cutler Pickering Hale and Dorr LLP, and Eli Goldston Lecturer at Harvard Law School.

** William H. Neukom Professor, Stanford Law School; of counsel, Lex Lumina PLLC. We thank Harry D. Hanson, Jordan L. Hirsch, Asher S. McGuffin, Hannah Santasawatkul, Mark D. Selwyn, Timothy D. Syrett, and Todd Zubler, all of WilmerHale, for their contributions, without which this Article would not have been possible. We thank Bernard Chao, Tom Cotter, Paul Gugliuzza, Rose Hagan, John Jarosz, Amy Landers, Brian Love, and Jonathan Masur for comments on an earlier draft. We also note that, as indicated throughout the Article, one or both of the authors have been involved in some of the cases discussed herein. The views expressed in this Article are our own.

The Federal Circuit and district courts should take action to correct the skewed balance caused by improper application of apportionment law. The Federal Circuit should end the "built-in apportionment" exception to apportionment and district courts should do the hard work at the *Daubert* stage of ensuring that apportionment is effective and reliable. Inventors, businesses, and the balance upon which the patent system was built depend on it.

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I. INTRODUCTION

> IF AN ACTION IS TAKEN THAT DISRUPTS THAT BALANCE, THEN AN ACTION SIMILAR IN KIND AND DEGREE IS REQUIRED TO RESTORE EQUILIBRIUM.

— J.K. FRANKO, EYE FOR EYE

The United States patent system is predicated upon a bargain: in exchange for the inventor disclosing her invention to the public, she is granted exclusive rights to that invention for a period of time. As the Supreme Court has explained, the patent system is "a carefully crafted bargain for encouraging the creation and disclosure of new, useful, and nonobvious advances in technology and design."[1] Critical to this "carefully crafted bargain" is ensuring that damages for patent infringement properly reflect the true value — and only the true value — of the invention at issue. When damages are so balanced, the patent system encourages innovation without allowing patentees a windfall: the patentee receives fair value for their invention without capturing the value of technology they did not invent.

But if patentees are permitted to recover damages on the value of technology they did *not* invent, the balance is disrupted: patentees can obtain an unjustified windfall; product companies can be required to pay for technology not covered by the patents-in-suit; and the incentives for innovation that builds on previously patented technology, as most innovation does, can be diminished rather than enhanced. Indeed, unlike other types of litigation damages — which are primarily remedial or used to deter bad conduct — excessive patent damages present an additional risk because they impose ongoing costs on innovative activity. They do so directly by making innovative companies pay too much in patent litigation, but also indirectly by creating damages benchmarks that increase the costs paid by other users in the future.[2] Excessive patent damages thus can impose extra social costs because they can deter innovation and increase the cost of products to consumers.[3] In short, the "carefully crafted bargain" depends in no

1. Bonito Boats, Inc. v. Thunder Craft Boats, Inc., 489 U.S. 141, 150–51 (1989). Mr. Lee represented an amicus in this case.

2. *See, e.g.*, William F. Lee & A. Douglas Melamed, *Breaking the Vicious Cycle of Patent Damages*, 101 CORNELL L. REV. 385, 418–20, 439 (2016) ("Excessively generous remedies can induce parties to obtain patents as litigation tools beyond their economic value to technology users and consumers."); *see also id.* at 457 ("[T]he remedy should be designed to create optimal incentives going forward, rather than to punish past conduct or deter similar conduct in the future."), 463 ("Enhancing royalties for ongoing infringement is thus not necessary for deterrent purposes and would inefficiently increase the marginal cost of, and thus reduce, both the commercialization of the patented technology and follow-on innovation.").

3. Notably, patent infringement does *not* require either intent to infringe or copying from the plaintiff. The vast majority of defendants are not even accused of copying from the patentee, but rather are independent developers. *See* Christopher A. Cotropia & Mark A. Lemley, *Copying in Patent Law*, 87 N.C. L. REV. 1421, 1449–52 (2009) (showing that outside of pharmaceuticals, between 95% and 99.5% of defendants are independent inventors).

small part on the need to ensure that patent damages are not excessive and, instead, reflect the actual incremental value of the claimed invention.[4]

The Federal Circuit has recognized this need to calibrate patent damages in several ways, the most important of which, for present purposes, is the principle of apportionment. Apportionment is rooted in the Supreme Court's nineteenth-century opinions in *Seymour v. McCormick*[5] and *Garretson v. Clark*[6] holding that, in every case, damages must be limited to the value of the patented invention and must not capture the value of other features or technology of the accused products.[7] The patentee thus can recover the value of her invention, but must "apportion" out the value of other features and technologies that she did not invent. When damages are properly apportioned, inventors obtain the value of what they created — and a product company need not fear disproportionate damages claims or verdicts that capture the value of other features and technologies, including technologies invented by the product company itself.

Apportionment has become even more critical in recent years.[8] Modern products and methods in the life sciences, computer sciences, and other fields often consist of hundreds or thousands of features and components.[9] Given the complexity of these products and technolo-

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As a result, most patent damages awards transfer money from inventors who commercialized the product to other inventors who might not have done so.

4. *See* Thomas F. Cotter, John M. Golden, Oskar Liivak, Brian J. Love, Norman V. Siebrasse, Masabumi Suzuki et al., *Reasonable Royalties*, *in* PATENT REMEDIES AND COMPLEX PRODUCTS: TOWARD A GLOBAL CONSENSUS 6, 19 (C. Bradford Biddle, Jorge L. Contreras, Brian J. Love & Norman V. Siebrasse eds., Cambridge Univ. Press 2019) ("We perceive a widespread consensus among innovation economists and lawyers that the . . . economic value of a patented technology to its implementer is the (actual or expected) profit or cost saving the implementer derives from the use of the patented technology over the next-best alternative.").

5. 57 U.S. 480 (1853).

6. 111 U.S. 120 (1884).

7. *McCormick*, 57 U.S. at 480; *Clark*, 111 U.S. at 121–22.

8. *See* John C. Jarosz & Michael J. Chapman, *The Hypothetical Negotiation and Reasonable Royalty Damages: The Tail Wagging the Dog*, 16 STAN. TECH. L. REV. 769, 815 n.215 (2013) ("Though increasingly important of late, apportionment is deeply rooted in case law.").

9. Damien Geradin & Anne Layne-Farrar, *Patent Value Apportionment Rules for Complex, Multi-Patent Products*, 27 SANTA CLARA HIGH TECH. L.J. 763, 763 (2011) ("The vast majority of the products developed by the information technology ('IT') industry are technologically complex, incorporating hundreds or thousands of different components, and many of these components read on an increasingly large number of patents held by a number of third parties."); *see also* Ann Armstrong, Joseph J. Mueller & Timothy D. Syrett, The Smartphone Royalty Stack: Surveying Royalty Demands for the Components Within Modern Smartphones 1–2 (June 1, 2014) (unpublished manuscript) (detailing the cumulative royalty demands, or "royalty stack," for patents claimed to cover technologies in a smartphone), https://papers.ssrn.com/sol3/papers.cfm?abstract_id=2443848 [https://perma.cc/3QH4-5G5V]; Mark A. Lemley & Carl Shapiro, *Patent Holdup and Roy-*

gies, patentees — inadvertently or intentionally — may seek to capture the value of features that they did not invent. A failure to properly apportion damages means that companies that make innovative products will pay two (or more) times for the right to use the same technology.

The recent rise in lawsuits brought by non-practicing entities ("NPEs") has also led to an increased risk of intentionally inflated demands capturing the value of technologies beyond the patent-at-issue.[10] Many NPEs — often backed by litigation funders and hedge funds — purchase, for minimal amounts, patents that neither the inventor nor the purchasing entity has used in the real world and then claim extraordinary damages from operating companies. Those damages demands frequently have little or no relationship to the actual value of the patents.[11] These NPEs often file multiple cases against a single product company, in different jurisdictions and one after another.[12]

Indeed, NPEs filed more than two thousand patent infringement suits in each year between 2020 and 2022.[13] In 2022, NPEs filed

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alty Stacking, 85 TEX. L. REV. 1991 (2007) (discussing case studies of telephony, which involves thousands of patents "essential" to the standard).

10. *See* James Bessen & Michael J. Meurer, *The Direct Costs from NPE Disputes*, 99 CORNELL L. REV. 387, 390–91 (2014) (noting that "NPE litigation has reached a wholly unprecedented scale and scope" with the growth due in part to "new sources of funding").

11. *See* Joshua G. Richey, *Tilted Scales of Justice? The Consequences of Third-Party Financing of American Litigation*, 63 EMORY L.J. 489, 510–13 (2013) (noting that litigation funders are particularly active in patent lawsuits due to the availability of treble damages); Maya Steinitz, *The Litigation Finance Contract*, 54 WM. & MARY L. REV. 455, 460–61 (2012) (noting that third-party litigation funding has grown from "a trickle of investments by hedge funds . . . into a flood . . . .").

12. Alan Devlin, *Antitrust Limits on Targeted Patent Aggregation*, 67 FLA. L. REV. 775, 778 (2015) (characterizing NPEs' tactics as "extortion[ate]"); *id.* at 819 (explaining that NPEs "threaten [their] targets with serial litigation and catastrophic damages unless they pay exorbitant amounts, typically many multiples of the sums that the [NPE] spent to acquire the asserted [intellectual property rights]"); *see also* Jonathan Stroud, *Pulling Back the Curtain on Complex Funding of Patent Assertion Entities*, 12 LANDSLIDE 20, 20–21, (Nov./Dec. 2019) (noting that "NPEs abound" and that "serial private assertion entities . . . using dozens and sometimes hundreds of nom de plume proxy entities is the new normal"); EXEC. OFF. OF THE PRESIDENT, PATENT ASSERTION AND U.S. INNOVATION 1 (June 2013) (explaining that NPEs "focus on aggressive litigation, using such tactics as . . . creating shell companies that make it difficult for defendants to know who is suing them; and asserting that their patents cover inventions not imagined at the time they were granted"); Mark A. Lemley & A. Douglas Melamed, *Missing the Forest for the Trolls*, 113 COLUM. L. REV. 2117, 2153–54 (2013) (noting the business model of patent aggregators, who acquire multiple patents and assert them seriatim against product-producing companies); Robin C. Feldman & Tom Ewing, *The Giants Among Us*, 2012 STAN. TECH. L. REV. 1, 2 (documenting the shell games large aggregators use to hide the extent of their patent portfolios).

13. *2022 Patent Dispute Report*, UNIFIED PATS. (Jan. 5, 2023), https://www.unifiedpatents.com/insights/2023/1/4/2022-patent-dispute-report [https://perma.cc/58ZR-6JFX]; *see also* U.S. GOV'T ACCOUNTABILITY OFF., GAO-23-105210, THIRD-PARTY LITIGATION FINANCING, MARKET CHARACTERISTICS, DATA, AND TRENDS (2022).

eighty-eight percent of all high-tech patent cases and sixty percent of patent cases overall; and twenty-nine percent of NPEs were backed by third-party funding.[14] By way of example, a single hedge-fund-backed NPE and its subsidiaries have filed more than five hundred patent complaints — most in the last decade alone — often seeking hundreds of millions or billions of dollars from operating companies.[15]

These hedge-fund-backed plaintiffs do not evaluate individual patents to determine their incremental value. Instead, they consider the patents as assets monetizable in litigation. For them, the value is not the real value of a patented invention in the real world; in fact, they typically don't make any products. Instead, the value is the amount that might be extracted by settlement or verdict from an operating product company by asserting an enormous damages claim. In other words, they view these patents in the same category as junk bonds or lottery tickets.[16] They acquire the patents for minimal amounts and then immediately assert multiple enormous damages claims against a product company. Their damages demands also are not checked by the threat of patent counterclaims or the patent holder's interest in preserving goodwill for commercial activities other than patent monetization, as these NPEs neither manufacture nor sell products. Consequently, these plaintiffs can assert extraordinary damages claims with little or no risk. And it does not matter to them if a particular damages claim is unsuccessful. If only one of their serial damages claims is successful before a court or a jury, these hedge-fund-backed NPEs consider their investment a success. A single "hit" among several lottery tickets makes their investment worthwhile.[17]

If the patent system worked perfectly, we might be indifferent to who filed patent lawsuits or how many they brought, because the more patents there were that covered a particular product, the less

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14. UNIFIED PATS., *supra* note 13.

15. *See* Stroud, *supra* note 12, at 21–23; *see also* Uniloc USA, Inc. v. Microsoft Corp., 632 F.3d 1292, 1321 (Fed. Cir. 2011) (seeking $565 million for alleged infringement of one patent); Uniloc USA, Inc. v. Apple Inc., No. 19-CV-01692, 2020 WL 4368207, at *4 (N.D. Cal. July 30, 2020) (seeking $1.10 billion for alleged infringement of one patent).

16. *See* Lemley & Melamed, *supra* note 12, at 2126 (discussing "lottery ticket" trolls that "are playing an uncertain shot at a big payout").

17. *Id.* (explaining that "lottery ticket" NPEs "are interested in a big jury award against one or more entrenched players in the industry"); *see also* Diane Bartz, *U.S. House Takes Up Bill Aimed at Fighting 'Patent Trolls*,*'* REUTERS (Feb. 5, 2015), https://www.reuters.com/article/congress-patents-usa/u-s-house-takes-up-bill-aimed-at-fighting-patent-trolls-idUSL1N0VF1YT20150205 [https://perma.cc/75H4-4D8M] ("'We have seen an exponential increase in the use of weak or poorly granted patents by patent trolls to file numerous patent infringement lawsuits against American businesses with the hope of securing a quick payday,' said Rep. Bob Goodlatte in introducing the measure that he has spearheaded.").

valuable any one patent would be. This is precisely what apportionment is designed to achieve.[18]

But therein lies the problem. Recently, the Federal Circuit and district courts have been backsliding from the principle of apportionment. Three related phenomena have led to excessive damages awards and, unless corrected, promise to undermine the "carefully crafted bargain" of patent damages.

First, some courts have allowed patentees to bypass apportionment entirely by relying on "built-in apportionment."[19] Courts have long allowed the use of prior license agreements to show damages if the agreements are technologically and economically comparable to a hypothetical license to the patents-in-suit.[20] The fact that a license meets the threshold for being "comparable," however, does not necessarily address or solve the apportionment problem. Apportionment requires a more careful analysis of the prior license and adjustment of any royalty derived from the license in order to reflect the specific patent, accused product, and economic circumstances associated with the hypothetical negotiation between the parties in litigation. Nevertheless, starting around 2014, courts began to permit plaintiffs to use purportedly comparable licenses to prove damages — agreements in

18. *See* VirnetX, Inc. v. Cisco Sys., Inc., 767 F.3d 1308, 1326 (Fed. Cir. 2014) ("These strict requirements limiting the entire market value exception [to the apportionment requirement] ensure that a reasonable royalty 'does not overreach and encompass components not covered by the patent.'" (quoting LaserDynamics, Inc. v. Quanta Comput., Inc., 694 F.3d 51, 70 (Fed. Cir. 2012))); Christopher S. Storm, *Measuring the Inventor's Contribution*, 21 U.N.H. L. REV. 167, 205 (2022) ("The 'essential requirement' of the apportionment doctrine is that 'the ultimate reasonable royalty award must be based on the incremental value that the patented invention adds to the end product.' This requirement prevents patentees from overreaching and capturing value outside the claimed invention. Thus, the apportionment doctrine theoretically has potential to ensure that damages awards reflect the value of the inventor's contribution, 'and no more.'"). Mr. Lee represented a party in the *VirnetX* case.

19. *See, e.g.*, Vectura Ltd. v. GlaxoSmithKline LLC, 981 F.3d 1030, 1041 (Fed. Cir. 2020) ("Built-in apportionment effectively assumes that the negotiators of a comparable license settled on a royalty rate and royalty base combination embodying the value of the asserted patent. . . . [A] party relying on a sufficiently comparable license can adopt the comparable license's royalty rate and royalty base without further apportionment and without proving that the infringing feature was responsible for the entire market value of the accused product."). Mr. Lee represented a party in the *Vectura* case.

20. *See* Apple Inc. v. Motorola, Inc., 757 F.3d 1286, 1325 (Fed. Cir. 2014) ("[U]sing sufficiently comparable licenses is a generally reliable method of estimating the value of a patent."); *see also* Jonathan S. Masur, *The Use and Misuse of Patent Licenses*, 110 NW. U. L. REV. 115, 123 (2015) ("Existing licenses — whether granted by the plaintiff for access to the patent technology, or purchased by the defendant for similar technologies — are thus front and center in reasonable royalty calculations."). For a detailed discussion of how the *Georgia-Pacific* factors, and reliance on "comparable" licenses in particular, lead to systemic overcompensation of patent holders, see Lee & Melamed, *supra* note 2, at 417–22; Hon. Arthur J. Gajarsa, William F. Lee & A. Douglas Melamed, *Breaking the Georgia-Pacific Habit: A Practical Proposal to Bring Simplicity and Structure to Reasonable Royalty Damages Determinations*, 26 TEX. INTELL. PROP. L.J. 51, 100–02 (2018).

many cases covering much more than the patents-in-suit — without the careful apportionment required by Supreme Court precedent. For example, even for agreements covering hundreds of patents, different products, or rights beyond patent rights, patentees asserting just a small subset of the licensed patents have been allowed to use the entirety of the royalty payments in those agreements as a basis for damages, without any apportionment whatsoever.[21]

This trend began in *Commonwealth Scientific & Industrial Research Organisation v. Cisco Systems, Inc.*,[22] where the Court of Appeals for the Federal Circuit found, based on the specific facts of that case, that apportionment was "built in" to the prior license because the prior license and the hypothetical negotiation involved similar circumstances.[23] The concept of "built in apportionment" was used as a description of context-dependent facts of that case. But subsequent Federal Circuit panel decisions then effectively transformed this factual description of a specific case into a legal principle that allowed courts to apply the royalties from prior comparable licenses more generally — despite significant differences and without doing the careful apportionment required by Supreme Court caselaw.

Second, patentees and their experts have figured out how to game the comparable license loophole to the apportionment requirement. An NPE in the business of litigation, not making products, will often structure its licensing and litigation campaign to generate spurious "comparable" licenses it can then point to in later litigation. In the worst case, those licenses are actually collusive, with the parties agreeing to a number no one actually pays. But even if the licenses are real, they can be manipulated in a variety of ways. One common approach is to find a small defendant that is either going out of business or makes very few products and charge it a high percentage royalty that turns out to be a small dollar figure. The defendant gets a good deal, paying only a small price, and the plaintiff gets to claim that "comparable" defendants are paying a very high percentage.[24] For this reason, some courts have refused to treat agreements as comparable if

21. *See, e.g.*, Elbit Sys. Land & C4I Ltd. v. Hughes Network Sys., LLC, 927 F.3d 1292, 1299–1301 (Fed. Cir. 2019) (affirming verdict based upon an allegedly comparable settlement agreement, where the patentee's expert merely assumed that apportionment was "implicit[]" in the prior agreement and thus did not do any apportionment). Mr. Lee represented a party in the *Elbit* case.

22. 809 F.3d 1295 (Fed. Cir. 2015).

23. *Id.* at 1303.

24. *See* Cotter et al., *supra* note 4, at 40 & n.137 (noting this problem); Masur, *supra* note 20, at 123. One possible example is *Pavo Solutions LLC v. Kingston Technology Co., Inc.*, where a prior licensee paid a very small price but made a representation that it was a large percentage of profits. 35 F.4th 1367, 1378–80 (Fed. Cir. 2022). The court allowed an expert to testify to the percentage of profits. *See id.* at 1372.

they were executed in the context of "the threat of a lawsuit" or "a history of litigation between the parties."[25]

Finally, compounding those problems, some courts have failed to properly apply *Daubert*[26] and Federal Rule of Evidence 702[27] to exclude unreliable apportionment theories or gamesmanship. *Daubert* is intended to reduce the chances that juries will be misled by specious expert testimony by requiring district courts to act as "gatekeepers" to prevent unsupported or unreliable testimony from being presented to the jury.[28] But some district courts have been lax in their application of *Daubert* to issues of patent damages and, in particular, apportionment. As discussed further *infra*, Section III.B.2, too many courts have allowed plaintiffs to rely on made-for-litigation econometric models that purport to apportion but are instead designed through a series of complex steps to produce unreasonable damages numbers. Many of these "models" have not been published, peer reviewed, or validated in any way. This is especially common where experts purport to use regressions and/or conjoint survey analysis. Both are commonly used economic tools and can be useful when properly applied. The problem, however, is that both analyses can be misused in ways that, whether intended or not, produce grossly inaccurate results. And in recent years, courts have repeatedly permitted parties to introduce deeply flawed regressions and conjoint survey analyses and have left it to the jury to decide their probative value and whether the expert did any real apportionment.[29] These courts failed to properly apply *Daubert* and, more importantly, undermined the critical apportionment requirement when they put the issue to the jury without first performing the required gatekeeping function.

The Federal Circuit's backslide on apportionment came to a head in its June 2024 decision in *EcoFactor, Inc. v. Google LLC*,[30] where a deeply divided Federal Circuit panel disagreed both on the analysis required for "built-in apportionment" and the level of rigor *Daubert* demands. On built-in apportionment, the majority blessed the patentee damages expert's extraction of a royalty rate from prior settlement agreements without any modification, notwithstanding that the agreements covered many non-asserted patents. The majority found that it was sufficient that the expert asserted without quantification that (1) the non-asserted patents would have an undefined downward

25. Microsoft v. Motorola, No. C10-1823, 2013 WL 2111217, at *67 (W.D. Wash. Apr. 25, 2013).

26. Daubert v. Merrell Dow Pharms., Inc., 509 U.S. 579 (1993).

27. FED. R. EVID. 702.

28. *Daubert*, 509 U.S. at 589.

29. *See infra* Section III.B.2 and accompanying text.

30. 104 F.4th 243 (Fed. Cir. 2024).

impact on the royalty rate; and (2) any downward impact would be canceled out by other factors. The majority found that any disagreement with this approach could be addressed at trial, asserting that the "standard for admissibility" should not be raised "too high."[31] The dissent argued that this skirted apportionment and allowed the expert to entirely avoid accounting for the specific value of non-asserted patents.[32] The dissent asserted that this failed to apportion and resulted in prejudicial testimony that, under *Daubert*, must be excluded from the jury.[33] *EcoFactor* in many ways demonstrates the problems discussed in this article.

These problems arise, in significant part, from a broader lack of attention given to patent damages issues by the courts, the academic community, and commentators. For strategic reasons, damages issues often receive little time both at trial and on appeal, while liability issues such as infringement and invalidity receive most of the attention.[34] For example, defendants may feel that focusing on damages suggests a concern about infringement, and opt instead to focus on liability defenses. As discussed further below, patent cases are plagued by a harmful combination of factors affecting damages issues: failures by the district court to perform its required gatekeeping function on damages issues before trial, insufficient time for the parties to fully develop damages issues at trial, and appellate proceedings that cannot fully address damages issues because they are based upon the incomplete evidentiary record developed during flawed trial proceedings.

All of this leaves the patent damages balance askew. Patentees — often NPEs — have been permitted to seek billions of dollars in damages for patents whose value is nowhere near that in the real world. And operating product companies face the risk of being forced to pay excessive damages capturing the value of technology the patentee did not invent. This is not the "carefully crafted bargain" the Supreme Court envisioned.[35]

In this Article, we explain the need to correct the application of apportionment principles in patent damages and how to do so. In Part I, we explain the history and analytical justification of apportionment. In Part II, we describe the ways in which courts have increasingly tolerated damages theories that sidestep apportionment. Finally, in Part III, we offer recommendations to address this danger-

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31. *Id.* at 257.
32. *Id.* at 259–62.
33. *Id.* at 262.
34. *See* Daralyn J. Durie & Mark A. Lemley, *A Structured Approach to Calculating Reasonable Royalties*, 14 LEWIS & CLARK L. REV. 627, 634 (2010).
35. *See* Bonito Boats, Inc. v. Thunder Craft Boats, Inc., 489 U.S. 141, 150–51 (1989).

ous trend and restore apportionment and the patent damages balance. These recommendations include: (1) recognizing that "built-in apportionment" is only the beginning of a careful, detailed damages analysis, not an exception that obviates the need for such an analysis; and (2) more reliably enforcing *Daubert* when plaintiffs offer unreliable apportionment methodologies. The issues addressed in this Article — and the recommendations designed to address them — apply to all types of patent cases, from computer sciences to life sciences, but are particularly relevant for cases involving complex products, which include multiple features and inventions.

II. THE DAMAGES BALANCE AND THE NEED FOR APPORTIONMENT

The animating principle of patent law is that granting inventors a limited monopoly over their inventions will encourage the creation and dissemination of valuable innovations.[36] As the Supreme Court explained more than 150 years ago, "[T]he limited and temporary monopoly granted to inventors was never designed for their exclusive profit or advantage; the benefit to the public or community at large was another and doubtless the primary object in granting and securing that monopoly."[37] A primary goal of the patent system is thus to promote public disclosure of inventions to stimulate further innovation.[38] The patent system creates an incentive to commercialize a new invention and disclose it to the public. To encourage such disclosure, the patent system grants the inventor a period of time in which she can secure the financial rewards for her invention.[39]

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36. Pfaff v. Wells Elecs., Inc., 525 U.S. 55, 63 (1998) ("[T]he patent system represents a carefully crafted bargain that encourages both the creation and the public disclosure of new and useful advances in technology, in return for an exclusive monopoly for a limited period of time.").

37. Kendall v. Winsor, 62 U.S. 322, 327–28 (1858); *see also* Quanta Comput., Inc. v. LG Elecs., Inc., 553 U.S. 617, 626 (2008) (noting that "the primary purpose of our patent laws is not the creation of private fortunes for the owners of patents but is 'to promote the progress of science and useful arts'" (quoting Motion Picture Pats. Co. v. Universal Film Mfg. Co., 243 U.S. 502, 511 (1917))).

38. Roger D. Blair & Thomas F. Cotter, *Rethinking Patent Damages*, 10 TEX. INTELL. PROP. L.J. 1, 45 nn.214–15 (2001) (listing numerous patent-related incentives); Aronson v. Quick Point Pencil Co., 440 U.S. 257, 262 (1979) (describing goals of patent system are to "foster and reward invention," to promote "disclosure of inventions to stimulate further innovation . . . and to permit the public to practice the invention once the patent expires," and to "assure that ideas in the public domain remain there for the free use of the public").

39. *See* United States v. Univis Lens Co., 316 U.S. 241, 250 (1942) ("The declared purpose of the patent law is to promote the progress of science and the useful arts by granting to the inventor a limited monopoly, the exercise of which will enable him to secure the financial rewards for his invention." (citing U.S. CONST. art. I, § 8, cl. 8; 35 U.S.C. §§ 31, 40)).

The damages balance is critical to the goal of fostering innovation. The patent system must allow inventors to recover the value of their inventions if someone uses that invention without permission; otherwise, inventors may be less inclined to innovate and more inclined to hold onto their ideas without disclosing them.[40] But, at the same time, the patent system cannot allow patentees to recover the value of technology that they did not invent. Doing so would have the very consequence the patent system was designed to avoid. Excessive damages awards would discourage innovation because operating product companies would not invest enough time and money developing new technologies building on prior or different inventions, and they would be less likely to implement possibly patented inventions.[41]

Consider, for example, the microprocessor used in modern computers, smartphones, televisions, and similar devices. First sold commercially more than fifty years ago, modern microprocessors are incredibly powerful and sophisticated:[42] a dime-sized microprocessor now includes hundreds of millions or billions of transistors and can perform billions of operations per second. Within microprocessors, there are countless components and features that determine the many different aspects of a system's performance, including transistors, instruction sets, instruction decoders and execution units, arithmetic logic units, input/output control modules, memory and memory controllers, graphics processing units, video processing, security and authentication functionality, registers, buses, data transfer protocol, and caches.[43] Imagine that an inventor obtains a patent on an incremental

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40. Lee & Melamed, *supra* note 2, at 391 ("There is little dispute that providing inadequate patent protection to inventors would leave them without optimal incentives to invent."); WILLIAM M. LANDES & RICHARD A. POSNER, THE ECONOMIC STRUCTURE OF INTELLECTUAL PROPERTY LAW 13 (2003) (explaining that "a firm is less likely to expend resources on developing a new product if competing firms that have not borne the expense of development can duplicate the product and produce it at the same marginal cost as the innovator"); Norman V. Siebrasse & Thomas F. Cotter, *A New Framework for Determining Reasonable Royalties in Patent Litigation*, 68 FLA. L. REV. 929, 946–47 (2016) (arguing that damages for patent infringement "should support the incentive system . . . by ensuring that inventors receive appropriate compensation for their inventions" in order "to promote the social good by encouraging individuals to create and disclose new inventions that otherwise would not be created and disclosed, or that would be created and disclosed only at higher cost or with greater delay").

41. Lee & Melamed, *supra* note 2, at 391 ("[T]he ultimate goal of fostering innovation would be undermined by providing too great a degree of protection to patents and, in particular, that excessive damages for patent infringement would reduce the overall incentive for firms to develop commercial products and to innovate by building on earlier inventions.").

42. Morning Edition, *5 Decades Ago, Intel Unveiled the First Commercially Available Microprocessor*, NPR, at 0:11 (Nov. 15, 2021, 7:17 AM), https://www.npr.org/2021/11/15/1055767733/5-decades-ago-intel-unveiled-the-first-commercially-available-microprocessor [https://perma.cc/RVS2-U66G].

43. *See also* Mark A. Lemley, *Ten Things to Do About Patent Holdup of Standards (and One Not To)*, 48 B.C. L. REV. 149, 151 (2007) ("In IT, however, one product regularly

improvement in the microprocessor's ability to delete audio files. If a microprocessor manufacturer is found to use that invention in its products, the inventor should get the value of just her invention, i.e., the incremental improvement of that specific audio file deletion feature within the microprocessor. If the inventor were allowed to also claim damages on the value of the memory, the graphics functionality, the instruction execution functionality, the bus technology, and more, this would lead to outrageous demands disconnected from what the patentee invented.

The problem is worse than that because that patentee will not be alone. Complex, multi-component inventions have thousands or even hundreds of thousands of patents on them.[44] And because there are likely many other inventors with patents on those aspects, if each inventor claims more than their share, the cost of licenses to make a microprocessor will rapidly grow to many times the actual value of the inventions it contains.[45] The manufacturer could make the economically rational decision not to invest in a new microprocessor at all, if it believes there is a significant risk a patentee will claim billions of dollars in alleged damages for a minor improvement in one small aspect of those products. That decision would deny the public not only the benefits of the microprocessors that would otherwise be produced by the manufacturer, but also the future innovations building upon the patented technologies that would otherwise be created by the manufacturer. This is a holdup problem.[46]

In other words, for the patent system to work as intended, patent damages must be balanced — they must allow the patentee to recover the value of what she invented, without capturing the value of what she did not. The Supreme Court developed the principle of apportionment to ensure this balance. Apportionment has its roots in the Supreme Court's 1853 decision in *Seymour v. McCormick*,[47] in which the patent-at-issue was directed to an "improvement" on existing reaping machines.[48] The Supreme Court held that it would be a "very grave error to instruct a jury that as to the measure of damages the

involves the combination of 50, 100, even 1000, or — as Intel lawyers, themselves, say with respect to their own core microprocessor — 5000 different patent rights.").

44. *See, e.g.*, Jessie Yang, Note, *The Use and Abuse of Patents in the Smartphone Wars: A Need for Change*, 5 CASE W. RES. J.L. TECH. & INTERNET 239, 244–45 n.36 (2014) (estimating that smartphones might implicate 250,000 patents) (citing Steve Lohr, *Apple-Samsung Patent Shifts to Trial*, N.Y. TIMES (July 28, 2012), http://www.nytimes.com/2012/07/30/technology/apple-samsung-trial-highlights-patent-wars.html [https://perma.cc/YET7-GMFG]).

45. *See, e.g.*, Lemley, *supra* note 43, at 152–53.

46. Lemley & Shapiro, *supra* note 9, at 1992–93; Carl Shapiro & Mark A. Lemley, *The Role of Antitrust in Preventing Patent Holdup*, 168 U. PA. L. REV. 2019, 2020–21 (2020).

47. 57 U.S. 480 (1853).

48. *Id.*

same rule is to govern, whether the patent covers an entire machine or an improvement on a machine."[49] Instead, the *McCormick* Court explained that a patentee cannot recover damages entailing "whole profits arising from the skill, labor, material, and capital employed in making the whole machine" where the patented invention covers only a portion of the reaping device.[50] As the Court concluded, a different rule "would be extending the statute so as to make it cover, in effect, things that the patentee did not invent, and which by law belong to the public at large."[51] Put in modern terms, the audio file deletion patentee should not be able to recover the value of the entire microprocessor.

Thirty-one years later in *Garretson v. Clark*,[52] the Supreme Court further developed the apportionment rule, holding that when the accused product includes features beyond what is covered by the patent-at-issue, damages may compensate for the allegedly infringing use of the patent and no more: "[T]he patentee . . . must *in every case* give evidence tending to separate or apportion the defendant's profits and the patentee's damages between the patented feature and the unpatented features."[53] Furthermore, "such evidence must be reliable and tangible, and not conjectural or speculative."[54]

Apportionment is now reflected in the Patent Act itself, which provides that, if a patentee proves infringement of a valid patent, a court "shall award the claimant damages adequate to compensate for the infringement, but in no event less than a reasonable royalty, for the use made *of the invention* by the infringer."[55] Damages thus must

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49. *Id.* at 491 (internal quotation marks omitted).

50. *Id.* at 490–91.

51. *Id.* at 482. The *McCormick* Court also presciently observed that a contrary rule would be problematic where a multi-component product is covered by multiple patents:

> If the measure of damages be the same whether a patent be for an entire machine or for some improvement in some part of it, then it follows that each one who has patented an improvement in any portion of a steam engine or other complex machines may recover the whole profits arising from the skill, labor, material, and capital employed in making the whole machine, and the unfortunate mechanic may be compelled to pay treble his whole profits to each of a dozen or more several inventors of some small improvement in the engine he has built. By this doctrine even the smallest part is made equal to the whole, and "actual damages" to the plaintiff may be converted into an unlimited series of penalties on the defendant.

Id. at 490–91.

52. 111 U.S. 120 (1884).

53. *Id.* at 121 (emphasis added) (citation omitted) (internal quotation marks omitted).

54. *Id.*

55. 35 U.S.C. § 284 (emphasis added).

be tied to "the invention" — not to other technology and features the patentee did not invent.[56]

This damages balance makes legal and economic sense. Overcompensating patentees leads to undesirable results in at least two ways.[57] First, allowing patentees to recover the value of technology that they did not invent raises costs and disincentivizes product companies from innovating.[58] A product company facing the realistic possibility of having to defend against extraordinary damages must account for this risk in its cost allocation — it must earmark funds to defend against and potentially pay unreasonable damages.[59] This can result in costs being passed on to the consumer in the form of higher prices, diminished funds, and reduced incentives for investment in research and development.[60] And if the disincentive is large enough, a product company may simply decide not to try — it will reduce ef-

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56. *Id.*; *see* Ericsson, Inc. v. D-Link Sys., Inc., 773 F.3d 1201, 1233 (Fed. Cir. 2014) ("In other words, the patent holder should only be compensated for the approximate incremental benefit derived from his invention.").

57. Lee & Melamed, *supra* note 2, at 391 (explaining that "the ultimate goal of fostering innovation would be undermined by providing too great a degree of protection to patents" and "that excessive damages for patent infringement would reduce the overall incentive for firms to develop commercial products and to innovate"); Brian J. Love, Note, *Patentee Overcompensation and the Entire Market Value Rule*, 60 STAN. L. REV. 263, 278 (2007) ("Many socially undesirable effects result when patentees are overcompensated for their inventive contributions.").

58. Suzanne Scotchmer, *Standing on the Shoulders of Giants: Cumulative Research and the Patent Law*, 5 J. ECON. PERSPS. 29, 32–33 (1991) (explaining that innovators have no reason to improve on any product covered by another's patent if that patent owner can claim the innovators' profit); Bernard Chao, *Lost Profits in a Multicomponent World*, 59 B.C. L. REV. 1321, 1342 (2018) ("[I]magine giving the inventor of a fundamental television technology the right to capture all of the profits from any kind of television, even those that incorporate later-developed improvements . . . . Other inventors would have no incentive to develop better televisions because the original patentee would get all of the profits."); Amy L. Landers, *Patent Claim Apportionment, Patentee Injury, and Sequential Invention*, 19 GEO. MASON L. REV. 471, 506–07 (2012) (discussing how different damages structures can incentivize or disincentivize innovation); FED. TRADE COMM'N, THE EVOLVING IP MARKETPLACE: ALIGNING PATENT NOTICE AND REMEDIES WITH COMPETITION 148 (2011) ("Patent damages that . . . overcompensate patentees for infringement compared to the market can have detrimental effects on innovation and competition . . . . Overcompensation raises costs to other innovators through multiple mechanisms and can deter innovation.").

59. *See* Suzanne Michel, *Bargaining for RAND Royalties in the Shadow of Patent Remedies Law*, 77 ANTITRUST L.J. 889, 895 (2011) ("[I]nflated damage awards can discourage innovation by raising the costs of product development and increasing the risks of investment for other innovators and manufacturers."); Lemley & Shapiro, *supra* note 9, at 1993 (explaining that excessive royalties "act as a tax on new products incorporating the patented technology, thereby impeding rather than promoting innovation"); *see also* Thomas F. Cotter, *An Economic Analysis of Enhanced Damages and Attorney's Fees for Willful Patent Infringement*, 14 FED. CIR. BAR J. 291, 313–14 (2004) ("[S]upracompensatory awards could . . . induce firms to . . . avoid marketing innovative products, or (in the antitrust context) [prevent them] from agreeing to unconventional, but socially desirable, methods for joint production and distribution of goods.").

60. *See* Love, *supra* note 57, at 279.

forts to develop new technology and new products. These concerns are not merely hypothetical. For instance, a smartphone maker recently announced plans to exit the German market where the patent burden has grown too large.[61]

Second, the possibility of recovering oversized damages may also induce inventors to obtain patents for the wrong reasons. Rather than seeking patents as a means to protect their innovations, rational companies may view patents simply as a source of revenue through licensing and litigation campaigns.[62] These entities may then choose to patent things that would not otherwise warrant patenting and devote their resources to litigation rather than further invention. Those decisions, in turn, would prompt practicing entities to obtain patents as defensive measures so that they might deter some patent assertions against them, and as offensive measures so that they would not miss out on the patent litigation jackpot. These would be economically reasonable decisions in a no-apportionment world: if patent litigation can net billions of dollars without investment in research, development, marketing, or other product expenses, why undertake the significant risk and expense of developing a new product rather than obtaining patents to be used as lottery tickets?

The possibility of a litigation windfall may also induce companies that don't invent at all to buy up and assert patents against those who do. Indeed, this NPE business model has grown in popularity.[63] And even though NPEs lose the vast majority of their lawsuits,[64] they continue to file them, because a windfall victory will pay for a lot of losses. Further, defendants understand this risk, so they are often willing to settle even weak lawsuits rather than risk a disproportionate damages award.[65]

None of this is good for society. While there is nothing inherently wrong with licensing patents that involve useful technology even if you cannot build products yourself, a misaligned damages system re-

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61. ETTelecom, *Vivo Quits Germany After Losing Patents Dispute with Nokia*, ECON. TIMES (June 14, 2023, 3:48 PM), https://telecom.economictimes.indiatimes.com/news/devices/vivo-quits-germany-after-losing-patents-dispute-with-nokia/100990833 [https://perma.cc/SUG9-DYSR].

62. Love, *supra* note 57, at 281 ("When courts award infringement damages that are greater than the intrinsic value of the litigated patents, they send the message to patent owners that aggressive enforcement of their patent rights will be more profitable than using those inventions to bring products to market.").

63. *See supra* notes 10–15 and accompanying text. NPEs are sometimes referred to as "patent assertion entities" or "patent trolls."

64. *See* John R. Allison, Mark A. Lemley & David L. Schwartz, *How Often Do Non-Practicing Entities Win Patent Suits?*, 32 BERKELEY TECH. L.J. 237, 269 (2017) (finding that NPEs lose the vast majority of patent lawsuits).

65. *See* John R. Allison, Mark A. Lemley & Joshua Walker, *Patent Quality and Settlement Among Repeat Patent Litigants*, 99 GEO. L.J. 677, 678–79, 700–701 (2011).

wards companies for choosing to license or sue rather than make products. Those lawsuits rarely promote innovation.[66]

The Supreme Court's recognition of apportionment as "[t]he true rule" of patent damages accordingly serves the purpose of properly calibrating patent incentives.[67] But as we will see in the next Part, that careful calibration is under attack.

III. THE DAMAGES BALANCE HAS BECOME SKEWED

A. 2009-2014: Apportionment Enforced

As technology products boomed in the 2000s into the 2010s, the Federal Circuit initially strengthened apportionment law. From 2009 to 2014, the Federal Circuit issued a series of opinions bolstering the apportionment requirement in four key ways.

First, the Federal Circuit made clear that, when dealing with complicated modern technology products, apportionment requires a rigorous analysis separating out the value of non-accused features. In *Lucent Technologies, Inc. v. Gateway, Inc.*,[68] Lucent alleged that the "calendar date-picker" feature in Microsoft's Outlook software infringed Lucent's patents directed to a method of entering information on a computer screen without using a keyboard.[69] Outlook, of course, has dozens if not hundreds of features beyond the "calendar date-picker." Nonetheless, at trial, Lucent's damages theory was based on eight percent of the total sales revenue for Outlook — effectively allocating one-twelfth of the value of a common email software application to a single "calendar date-picker" feature.[70] The jury found infringement and awarded $357 million in damages, a figure calculated by applying a royalty rate to total Outlook revenue.[71]

In its 2009 decision, the Federal Circuit reversed the damages award for failure to apportion. Citing *McCormick* and *Garretson*, the Federal Circuit held that the patentee could not use the total revenue

66. *See* Lemley & Shapiro, *supra* note 9, at 1995–96 (explaining that parties are better off litigating if rewards exceed design or redesign costs); Mark A. Lemley & Robin Feldman, *Is Patent Enforcement Efficient?*, 98 B.U. L. REV. 649, 651–52 (2018); Amy L. Landers, *Let the Games Begin: Incentives to Innovation in the New Economy of Intellectual Property Law*, 46 SANTA CLARA L. REV. 307, 346 (2006) ("To the extent that such companies are discouraged from commercializing products in favor of licensing, such companies may fail to develop the follow-up innovation and improvements attendant with testing products in the market.").

67. Dobson v. Hartford Carpet Co., 114 U.S. 439, 445 (1885); *see* Westinghouse Elec. & Mfg. Co. v. Wagner Elec. & Mfg. Co., 225 U.S. 604, 610 (1912).

68. 580 F.3d 1301 (Fed. Cir. 2009).

69. *Id.* at 1308, 1317, 1338.

70. *Id.* at 1323.

71. *Id.* at 1336.

for an accused product in calculating damages (that is, use the "entire market value" of the product) because the patentee had not shown that the patented feature was "the basis" of demand for that product.[72] This makes sense: if the evidence shows that the patented feature creates the entire value of the product, it is sensible to use all product revenues to calculate damages.[73] But by the same token, if one patented feature creates the entire demand for the product, the value of all the other features should logically be zero.[74]

The Federal Circuit in *Lucent* held that this "entire market value" rule is a narrow exception to the general rule that apportionment is required. The court in *Lucent* explained that, where the patentee had not shown that the patented feature is "the basis" of demand for an accused product, the patentee could not simply apply a royalty rate to all revenues from the accused product.[75] The Federal Circuit therefore held that the plaintiff in *Lucent* had overreached. The accused calendar date-picker tool was "but a very small component of a much larger software program,"[76] and there was no evidence that Outlook customers had purchased Outlook because of the calendar date-picker feature. The plaintiff was not allowed to use the "entire market value" of Outlook, and it therefore violated principles of apportionment by using all Outlook revenues to get to its damages number.[77]

Second, in 2012, the Federal Circuit held that apportionment in modern technology products is not satisfied by showing that the feature at issue is "important" or even "essential."[78] In *LaserDynamics,*

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72. *Id.* at 1336–38; *see* Mark A. Lemley, *Distinguishing Lost Profits from Reasonable Royalties*, 51 WM. & MARY L. REV. 655, 660–63 (2009) (explaining that the entire market value rule makes sense primarily in lost profits cases where the plaintiff can show that people bought the defendant's product because of the patented feature).

73. *E.g.*, Love, *supra* note 57, at 275 ("[W]hen a patented component accounts for the entire market demand for a product, and thereby is the sole reason why a consumer would purchase the accused device over its next best alternative, the patentee deserves to be compensated based on the entire value of the product.").

74. The entire market value rule arose in lost profits cases where the parties compete directly, and it makes somewhat more sense in that context. If the question is whether the customer will buy the product from the plaintiff or the defendant, and if the patented feature really is the thing that drives that purchase decision, infringing will take a sale away from the plaintiff. Mentor Graphics Corp. v. Eve-USA, Inc., 851 F.3d 1275, 1290 (Fed. Cir. 2017). That is why patentees in lost profits cases can recover "convoyed sales" of unpatented items that would be sold alongside the patented one. Warsaw Orthopedic, Inc. v. NuVasive, Inc., 778 F.3d 1365, 1375 (Fed. Cir. 2015). But even in lost profits cases, the decision that the patented good is the basis for demand should be quite rare, because it means that none of the other components of the invention will receive any value in the calculation. And it makes no sense to extend the idea to reasonable royalties. *See* Lemley, *supra* note 72, at 663 (making this point).

75. *Lucent*, 580 F.3d at 1337–38.

76. *Id.* at 1337.

77. *Id.* at 1337–38.

78. LaserDynamics, Inc. v. Quanta Comput., Inc., 694 F.3d 51, 68 (Fed. Cir. 2012).

Inc. v. Quanta Computer, Inc.,[79] the plaintiff attempted to broaden the entire market value rule exception to the apportionment requirement by arguing that the patented feature was an "important" one, and that apportionment therefore was not required.[80] The plaintiff alleged that laptop manufacturer Quanta infringed a patent directed to methods for enabling an optical disc drive ("ODD") to automatically identify the type of optical disk, e.g., a CD versus a DVD.[81] LaserDynamics's damages expert testified that a two percent royalty of the total sales of laptop computers was the appropriate damages number.[82] The expert premised his opinion on the assertion that the asserted patent "provided an *important and valuable function* that was present in all ODDs currently in use, and that the presence of this function was a prerequisite for any laptop computer to be successful in the marketplace."[83] In other words, the expert argued that no apportionment was required because the patented feature was necessary for the product to work and to sell in the market. The expert applied his two percent rate to Quanta's total revenue from laptop sales — $2.53 billion — to arrive at the $52 million number presented to the jury.[84] The jury found infringement and awarded $52 million in damages.[85]

The Federal Circuit reversed, recognizing that, in complex technology products, there can be many "important" features — any one of which is necessary for the product to work — but that cannot be sufficient to avoid the apportionment requirement. The Federal Circuit held that apportionment is required even when the feature at issue is "valuable, important, or even essential":

> *It is not enough to merely show that the disc discrimination method is viewed as valuable, important, or even essential to the use of the laptop computer*. Nor is it enough to show that a laptop computer without an ODD practicing the disc discrimination method would be commercially unviable. *Were this sufficient, a plethora of features of a laptop computer could be deemed to drive demand for the entire product*. To name a few, a high resolution screen, responsive keyboard, fast wireless network receiver, and extended-life battery are all in a sense important

79. 694 F.3d 51 (Fed. Cir. 2012).
80. *Id.* at 60.
81. *Id.* at 56, 59.
82. *Id.* at 60.
83. *Id.* (emphasis added).
84. *Id.* at 61.
85. *Id.* at 68.

> or essential features to a laptop computer; take away one of these features and consumers are unlikely to select such a laptop computer in the marketplace. *But proof that consumers would not want a laptop computer without such features is not tantamount to proof that any one of those features alone drives the market for laptop computers*.[86]

The Federal Circuit thus reiterated that "[t]he entire market value rule is a narrow exception to this general rule [of apportionment]"[87] and can be invoked only when a plaintiff can make the strong showing that the patented feature is "*the* basis" for demand for the entire product.[88] Because LaserDynamics's expert failed to apportion the incremental revenues from the accused laptops products specifically attributable to the ODD feature, the damages award was improper.[89]

Third, the Federal Circuit in *VirnetX, Inc. v. Cisco Systems, Inc.*[90] held, two years later, that apportionment is required even when the plaintiff accuses the smallest saleable unit.[91] The concept of using the smallest saleable unit, sometimes also referred to as the "smallest saleable patent-practicing unit" ("SSPPU"), as a starting point for damages makes sense because it reduces the layers of speculation required to calculate damages. If there is a market for the patented component, it is easier to determine the value of that component directly than it is to determine the value of a larger product and then determine what value the component contributes to that product.

The idea that the smallest saleable unit should be used as the starting point for apportioning the royalty base was first adopted by Federal Circuit Judge Randall Rader (sitting by designation in district court) in *Cornell University v. Hewlett-Packard Co*.[92] The invention at issue in *Cornell* was a "method for instruction issuance within a computer processor."[93] The patented method was embodied in one component of a computer processor.[94] But the computer processors themselves were combined with "a temperature controlling thermal

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86. *Id.* (emphasis added). Indeed, many products have hundreds or even thousands of "essential" patented technologies, see Mark A. Lemley & Timothy Simcoe, *How Essential Are Standard-Essential Patents?*, 104 CORNELL L. REV. 607, 611 (2019), but that does not mean that each one is or could be *the* reason consumers buy the product.

87. *LaserDynamics*, 694 F.3d at 67.

88. *Id.* (emphasis added) (quoting Lucent Techs., Inc. v. Gateway, Inc., 580 F.3d 1301, 1336 (Fed. Cir. 2009)).

89. *Id.* at 68–69.

90. 767 F.3d 1308 (Fed. Cir. 2014).

91. *Id.* at 1329.

92. 609 F. Supp. 2d 279, 283 (N.D.N.Y. 2009).

93. *Id.*

94. *Id.*

solution, external cache memory, and a power converter" to form "CPU bricks."[95] Multiple CPU bricks were included in a "cell board" installed in a server.[96] Thus, the accused technology was at most only a component of a component within the CPU bricks used in Hewlett-Packard's servers and workstations.[97] Accordingly, the accused "servers and systems include vast amounts of technology beyond the infringing part of the processors."[98]

Despite these facts, Cornell offered at trial a damages theory using the entire revenue of servers and workstations without "credible and sufficient economic proof that the patented invention drove demand for Hewlett-Packard's entire server and workstation market."[99] After excluding this expert testimony midtrial, Judge Rader gave Cornell another opportunity to provide expert testimony "that takes into account to some degree . . . the fact that the claimed invention is not the entire system but only a component of a component of that system."[100]

Cornell's revised damages theory was instead based on a "hypothetical royalty base" of CPU bricks.[101] Judge Rader rejected this approach because it "was not premised on any market transactions," as Hewlett-Packard's customers "by and large purchased complete server and workstation systems, not CPU bricks."[102] Further, he concluded that this model continued to be flawed because it sought damages "based on technology beyond the scope of the claimed invention."[103] Notably, this shortcoming was entirely avoidable because the "logical and readily available alternative was the smallest salable infringing unit with close relation to the claimed invention — namely the processor itself."[104] The record also contained market evidence of the processor price based on sales of 31,000 infringing processors during the damages period.[105] In other words, the processor, as the "smallest salable unit," should have been the starting point for the apportionment analysis.[106]

Judge Rader's focus on "real world transactions" and a "discernable market" for the smallest saleable unit is economically sensible.[107]

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95. *Id.*
96. *Id.*
97. *See id.*
98. *Id.*
99. *Id.* at 284.
100. *Id.* (quoting trial transcript).
101. *Id.*
102. *Id.* at 285, 287.
103. *Id.* at 284–85.
104. *Id.* at 288.
105. *Id.* at 283.
106. *Id.* at 285, 288.
107. *Id.* at 287.

The market price of the smallest saleable unit provides an objective starting point for assessing the value that patented functionality provides. The purchase price of a component reflects how manufacturers value that functionality. To the extent that patented technology provides a benefit to a component, it should be reflected in the price of the component (along with other attributes of the component). For example, if patented technology provides a performance boost to a component as compared to competing components — e.g., increased processing speed or decreased power consumption — that benefit should be reflected in a higher price for the better-performing component. Accordingly, the market price of the smallest saleable unit that incorporates patented technology provides a reliable, objective starting point for determining the value of that patent.

But some patentees have since tried to use the idea of the "smallest saleable unit" as a way to avoid further apportionment. After *Lucent* limited the use of the entire market value rule, patentees attempted to calculate damages using the entire value of a product based on the fact that the product was the "smallest salable unit" containing the patented feature — even if the patented feature was not "the basis" of demand for that product.[108] For example, imagine that the patentee sued a laptop maker for infringing a patent relating to an improvement on a specific feature of a microprocessor (a saleable product) such as an incremental improvement on the ability to delete audio files. In such a case, the patentee would apportion the revenue base down to the entire microprocessor and then use the entire value of the microprocessor in the damages calculation even though the patent covered only one feature of the microprocessor. Patentees argued that this was appropriate because the sales price of the smallest saleable unit was knowable; was less than the price of the entire accused product; and, according to the patentees, was "apportioned."[109] The problem, of course, is that this approach is likely to capture the value of non-patented features within the smallest saleable unit — for instance, other features of the microprocessor that the patentee did not invent.

The Federal Circuit in *VirnetX* rejected this end-run around the apportionment requirement, holding that the patentee does not satisfy

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108. The jury instruction in *VirnetX* identified this method of calculating damages as a second exception (after the "entire market value" rule) to the apportionment requirement: "In determining a royalty base, you should not use the value of the entire apparatus or product unless either: (1) the patented feature creates the basis for the customers' demand for the product, or the patented feature substantially creates the value of the other component parts of the product; or (2) the product in question constitutes the smallest saleable unit containing the patented feature." VirnetX, Inc. v. Cisco Sys., Inc., 767 F.3d 1308, 1327 (Fed. Cir. 2014).

109. *See id.* at 1328–29.

its duty to apportion merely by limiting the royalty base to the value of the "smallest saleable unit."[110] The plaintiff, VirnetX, had alleged that the FaceTime feature in certain Apple devices, such as iPhones, infringed VirnetX patents directed to secure domain name service ("DNS") technology.[111] VirnetX's expert presented various damages theories, each based on the cost of the entire iPhone (and other accused devices), without any additional apportionment tied to the covered DNS procedures.[112] VirnetX argued this approach was appropriate because the accused devices were the "smallest saleable unit" — Apple did not sell smaller components that included FaceTime.[113] VirnetX argued that by starting with the smallest saleable product that included the accused feature, it satisfied the apportionment requirement.[114] The jury awarded VirnetX $368 million in damages.[115]

The Federal Circuit reversed, finding that even if the patentee starts its damages calculation with the smallest saleable unit, the apportionment inquiry does not end there.[116] Rather, identifying damages associated with the smallest saleable unit is "simply a step toward meeting the requirement of apportionment."[117] Looking back to *Cornell*, the court explained that the aim was to identify "the smallest salable infringing unit *with close relation to the claimed invention*."[118] And "[w]here the smallest salable unit is . . . a multi-component product containing several non-infringing features with no relation to the patented feature[,] . . . the patentee must do more to estimate what portion of the value of that product is attributable to the patented technology."[119] As the *VirnetX* court recognized, a different rule would "permit the entire market value exception to swallow the rule of apportionment."[120]

Finally, the Federal Circuit emphasized the importance of apportionment by articulating an *evidentiary* requirement designed to prevent patentees from evading the requirement. Specifically, in *Uniloc*

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110. *Id.* at 1327.
111. *Id.* at 1315.
112. *Id.* at 1325.
113. *Id.* at 1328.
114. *Id.*
115. *Id.* at 1316.
116. *Id.* at 1327 ("[T]he [lower court's] instruction mistakenly suggests that when the smallest salable unit is used as the royalty base, there is necessarily no further constraint on the selection of the base. That is wrong.").
117. *Id.*
118. *Id.* (quoting Cornell Univ. v. Hewlett-Packard Co., 609 F. Supp. 2d 279, 287–88 (N.D.N.Y. 2009) (emphasis added)).
119. *Id.*
120. *Id.* at 1327–28; *see id.* at 1328 n.2.

USA, Inc. v. Microsoft Corp.,[121] the court held that a patentee not only must separate out the value of all non-patented features but also should not be allowed to introduce into evidence at trial the total revenues the defendant made as a result of the non-patented features. In that case, the patentee accused the product-activation process in Microsoft's Office and Windows software of infringement.[122] To calculate damages, Uniloc's damages expert started with the entire value of Microsoft's "Product Key," applied a royalty rate, and asserted that total damages were $564 million.[123] As a purported "check," the expert compared his damages number to the gross revenue for Office and Windows — $19.28 billion.[124] He asserted that because his calculated royalty was only 2.9% of Microsoft's revenue, his number was "reasonable."[125] The jury awarded $388 million in damages.[126]

The Federal Circuit vacated the damages award and ordered a new trial on damages, holding that the plaintiff's reference to Microsoft's total revenues from the accused products had violated apportionment principles.[127] Because the plaintiff had not shown that the accused feature was "the basis" for consumer demand for Microsoft's Office and Windows software, using Microsoft's total revenues was impermissible even if only as a "check" to purportedly show the requested damages were "reasonable."[128] The court reiterated that Supreme Court and Federal Circuit "precedents do not allow consideration of the entire market value of accused products for minor patent improvements simply by asserting a low enough royalty rate."[129] And the court held that even mentioning the entire market value of the accused product was not permitted: such evidence "cannot help but skew the damages horizon for the jury, regardless of the contribution of the patented component" and therefore would make it more likely that the jury will award a windfall.[130] The Federal Circuit later described the purpose of this "important evidentiary principle": it

121. 632 F.3d 1292 (Fed. Cir. 2011).
122. *Id.* at 1297.
123. *See id.* at 1311.
124. *Id.*
125. *Id.* at 1312.
126. *Id.* at 1301.
127. *See id.* at 1318–21. The court also found a flaw in how Uniloc arrived at its royalty rate. Uniloc started with a twenty-five percent "rule of thumb" royalty. *Id.* at 1311. The court abrogated the twenty-five percent "rule of thumb" royalty rate as insufficiently tied to the facts of the case. *Id.* at 1315. The court found that simply asserting that patentees *typically* started with a twenty-five percent royalty as a "rule of thumb" was arbitrary and disconnected to the facts — there was no evidence that the parties at issue ever used that rate or would have agreed to it. *Id.* at 1318. The court held that any royalty rate must be connected to the specific facts at issue. *Id.* at 1317–18.
128. *Id.* at 1318–19.
129. *Id.* at 1320.
130. *Id.*

"help[s] our jury system reliably implement the substantive statutory requirement of apportionment of royalty damages to the invention's value."[131] As the court explained:

> [I]t is not that an appropriately apportioned royalty award could never be fashioned by starting with the entire market value of a multi-component product — by, for instance, dramatically reducing the royalty rate to be applied in those cases — it is that reliance on the entire market value might mislead the jury, who may be less equipped to understand the extent to which the royalty rate would need to do the work in such instances.[132]

The Federal Circuit recognized, in other words, that even the mention of revenues attributable to non-patented features could disrupt the balance and overcompensate the patent holder.

* * * * *

Thus, by the mid-2010s, courts had clearly applied apportionment law to modern technologies and complex products, and the law was in many respects consistent with the objectives of patent law and the damages balance as set forth in *McCormick* and *Garretson*. Patentees were held to a standard that required careful apportionment analysis and were required to adhere to evidentiary rules that reduced the risk of damages awards including the value of non-patented technology. In short, the Federal Circuit enforced apportionment rules that limited the likelihood of outsized damages claims divorced from the value of the patented technology.[133]

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131. Ericsson, Inc. v. D-Link Sys., Inc., 773 F.3d 1201, 1226 (Fed. Cir. 2014).

132. *Id.* at 1227.

133. *E.g.*, Smartflash LLC v. Apple Inc., No. 13-CV-447, 2015 WL 5840237, at *7–8 (E.D. Tex. Sept. 2, 2015) (setting aside a half a billion dollar jury verdict, and ordering a new trial on damages, where patentee failed to apportion, instead "includ[ing] the complete product revenue in the royalty base" and "emphasize[d] the value of the entire product" in trial presentation); Good Tech. Corp. v. MobileIron, Inc., No. 12-CV-05826, 2015 WL 3882608, at *7–8 (N.D. Cal. June 23, 2015) (patentee must apportion: "[e]vidence that customers would not have purchased [accused] products if they did not practice the patents-in-suit is insufficient because no evidence suggests that any patented feature was the primary reason customers purchased infringing product"); Intelligent Verification Sys., LLC v. Microsoft Corp., No. 12-CV-525, 2015 WL 1518099, at *12–15 (E.D. Va. Mar. 31, 2015) (excluding patentee's damages theory where expert failed to apportion within smallest saleable unit).

B. Apportionment Weakened

Recent events, however, have upset this delicate balance, as there has been an important shift in the manner in which courts have handled apportionment.[134] First, while continuing to pay lip service to apportionment, courts have increasingly allowed an exception to the rule for so-called "built-in apportionment" when patentees rely on prior license agreements to calculate damages.[135] That is particularly problematic because patentees have figured out how to game the design of their licenses so they don't necessarily reflect the value of the invention.

Second, by not appropriately enforcing *Daubert* and Federal Rule of Evidence 702 where plaintiffs offer unreliable and untested damages methodologies, courts have allowed patentees to sidestep apportionment.[136]

These developments have significantly weakened the apportionment requirement and allowed patentees to seek outsized damages far exceeding the true value of the patented invention. The consequences of these developments have been exacerbated by the proliferation of NPE-filed cases and, more importantly, by the NPE cases that are paid for by litigation funders or hedge funds, in which the shell plaintiffs' only incentive is to assert the largest damages award possible.

This weakening of apportionment principles did not happen all at once. The Federal Circuit did not suddenly decide that apportionment is no longer necessary. Instead, the shift has happened gradually, and some of the decisions undermining the apportionment requirements resulted from particular factual circumstances in which the result was not irrational. But these rulings have now been extended to very different scenarios and stretched in ways that threaten to swallow up important aspects of apportionment.

1. Comparable Licenses and "Built-In Apportionment"

Courts have long understood that license agreements can provide a useful benchmark to aid damages calculations. Following the Southern District of New York's often-cited 1970 decision in *Georgia-Pacific Corp. v. United States Plywood Corp.*,[137] many courts have

134. *See* Mark A. Lemley, *The Surprising Resilience of the Patent System*, 95 TEX. L. REV. 1, 11 (2016) (noting that in the 2000s the Federal Circuit had "begun to rein in outlandish theories of patent damages" but that "[b]y 2015, the tenor of the debate had changed").

135. *See infra* Section III.B.1.

136. *See infra* Section III.B.2.

137. 318 F. Supp. 1116 (S.D.N.Y. 1970).

recognized that "comparable" license agreements can be used as a measure of damages.[138] The idea is simple — just as one would look at the price of comparable houses before agreeing on a purchase price for a home, parties to a patent licensing negotiation would look to the price of comparable licenses before deciding what to pay to license a patent. But courts have also recognized that prior license agreements are useful only if they are "comparable" to a hypothetical license to the asserted patent that the parties would have entered into before the infringement began.[139]

Prior licenses must be comparable in two ways: the licenses must be (1) technologically comparable, i.e., involving the patent-in-suit or something technologically close to it so the factfinder can reasonably infer that the prior royalty is relevant to the value of a royalty for the technology at issue in the litigation;[140] and (2) economically comparable.[141] A litigant seeking to rely on a prior agreement bears the burden of showing, for example, that the scope of the prior license is similar to the scope of the hypothetical license[142] and that the market or economic position of the parties to the prior license is similar to that of the parties to the hypothetical negotiation.[143]

Economic comparability is required because, even if the technology of the prior license is the same or sufficiently similar to the technology of the patent-in-suit, the royalty stated in the license might nevertheless shed little light on the incremental value of the licensed technology. Such differences can arise for a variety of reasons because, in the real world, patent license agreements are entered for reasons entirely disconnected from the value of a particular covered patent.

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138. *Id.* at 1120; *see also supra* note 20.

139. Adasa Inc. v. Avery Dennison Corp., 55 F.4th 900, 915 (Fed. Cir. 2022) ("The party proffering a license bears the burden of establishing it is sufficiently comparable to support a proposed damages award."); *see* LaserDynamics, Inc. v. Quanta Comput., Inc., 694 F.3d 51, 79 (Fed. Cir. 2012) ("When relying on licenses to prove a reasonable royalty, alleging a loose or vague comparability between different technologies or licenses does not suffice . . . [We] insisted that the 'licenses relied upon by the patentee in proving damages [be] sufficiently comparable to the hypothetical license at issue in suit.'" (quoting Lucent Techs., Inc. v. Gateway, Inc., 580 F.3d 1301, 1325 (Fed. Cir. 2009))).

140. *See Adasa*, 55 F.4th at 915 (Fed. Cir. 2022).

141. Bio-Rad Lab'ys, Inc. v. 10X Genomics, Inc., 967 F.3d 1353, 1372–73 (Fed. Cir. 2020).

142. *See* Summit 6, LLC v. Samsung Elecs. Co., 802 F.3d 1283, 1298–99 (Fed. Cir. 2015) (finding that Summit, the plaintiff, "failed to present evidence that the Facebook license was comparable or relevant to calculating a reasonable royalty" in its case).

143. *See* Wordtech Sys., Inc. v. Integrated Networks Sols., Inc., 609 F.3d 1308, 1320 (Fed. Cir. 2010); ResQNet.com, Inc. v. Lansa, Inc., 594 F.3d 860, 870 (Fed. Cir. 2010); *Bio-Rad Lab'ys*, 967 F.3d at 1372–73 ("Assessing the comparability of licenses requires a consideration of whether the license at issue involves *comparable technology*, is *economically comparable*, and arises under *comparable circumstances* as the hypothetical negotiation.") (emphasis added).

For example, companies often obtain patent licenses as part of much larger litigation settlement agreements. The patent owner files suit, accusing the defendant of infringement, and the parties then settle the dispute. In exchange for a payment to the patent owner, the lawsuit is dismissed, and the defendant obtains a license to the asserted patent. But the defendant does not obtain *only* a license to the asserted patent — it also receives a dismissal of the litigation, avoids legal fees, avoids the cost and disruption of a jury trial, avoids the risk of a larger damages verdict or willfulness finding, avoids negative publicity, and often obtains a license that covers more than just the asserted patent. The payment in these settlement agreements can thus be driven by factors other than those that would have affected the hypothetical negotiation, and the payment may reflect far more than the value of a particular patented feature.[144]

Patent license agreements often license a bundle of intellectual property rights. For example, companies often negotiate licenses not to an individual patent — or even to a handful of patents — but to an entire portfolio that includes dozens or hundreds of patents.[145] The idea is often to obtain patent peace between two companies, or to ensure freedom to operate in a technical area.[146] In those circumstances, the payment made by the licensee does not reflect the value of a single patent or feature but, instead, covers the full collection of rights transferred.[147]

Parties also often enter technology or joint development agreements that include patent license provisions. In a technology or joint development agreement, the licensee obtains not just a patent license, but also access to the underlying technology — for instance, product specifications, design details, technical data, know-how, assistance in

144. *See* Lee & Melamed, *supra* note 2, at 420; Lemley & Shapiro, *supra* note 9, at 2018–19; Rude v. Westcott, 130 U.S. 152, 164 (1889) ("It is clear that a payment of any sum in settlement of a claim for an alleged infringement cannot be taken as a standard to measure the value of the improvements patented, in determining the damages sustained by the owners of the patent in other cases of infringement. Many considerations other than the value of the improvements patented may induce the payment in such cases."); Prism Techs. LLC v. Sprint Spectrum L.P., 849 F.3d 1360, 1369–70 (Fed. Cir. 2017) (citing *Rude*, 130 U.S. at 164); In re Mahurkar Double Lumen Hemodialysis Catheter Pat. Litig., 831 F. Supp. 1354, 1379 (N.D. Ill. 1993) ("[P]eople may settle patent litigation to reduce the costs of the legal process. The terms of a settlement reflect these costs as well as the parties' estimates about the probable outcome on the merits if the case proceeds."); Masur, *supra* note 20, at 124–25 ("[C]ourts and commentators generally disfavor licenses that parties negotiated as settlements to ongoing litigation. Courts have reasoned that litigation distorts the licensing prices that defendants are willing to pay, skewing the prices upward.").

145. Gideon Parchomovsky & R. Polk Wagner, *Patent Portfolios*, 154 U. PA. L. REV. 1, 27–29 (2005).

146. *See id.* at 33.

147. *See id.* at 27–29.

developing a product, and so forth.[148] Again, payment in these agreements is not specific to a particular patent; it includes the value of other technology and intellectual property, unpatented know-how, and business assistance.[149] In any of these circumstances, the payment may not reflect the economic and incremental value of the patent-at-issue.

Parties to litigation also have argued that real-world licenses can be different from the hypothetical license to the patents at issue because the hypothetical negotiation assumes that the patents at issue are valid and infringed, while in the real world, companies may not make this assumption.[150] No one assumes that all patents are valid and infringed. They aren't. As Carl Shapiro puts it, a patent isn't a right to exclude, but rather a right to *try* to exclude.[151] Patentees win only about twenty-five percent of their cases, a number that has remained unchanged for decades.[152] Businesspeople understand that no real-world patent license is truly comparable to the result of the hypothetical negotiation in a damages award, because the real world makes different assumptions than the patent damages cases do.[153] The negotiation is truly hypothetical.

For all of these reasons, there will very often be differences between real-world agreements and the hypothetical negotiation.[154] The job of apportionment is to identify the differences that impacted the payment amount and account for them in order to ensure that damages stemming from the use of such agreements do not reflect more than

148. *See generally* Jerry C. Liu, *Overview of Patent Ownership Considerations in Joint Technology Development*, 2005 SYRACUSE SCI. & TECH. L. REP. 1, 2 (providing overview of technology development agreements).

149. As another example where the royalty in a prior license sheds little light on the incremental value of the technology at issue in a subsequent litigation, it may be the case that the technology was licensed for use in a more or less valuable product than the products accused in the litigation.

150. *See* Consol. Rubber Tire Co. v. Diamond Rubber Co., 226 F. 455, 458 (S.D.N.Y. 1915) (Hand, J.) (noting that patent royalties may be reduced if the market believes — wrongly, as it turns out — that the patent was invalid).

151. Mark A. Lemley & Carl Shapiro, *Probabilistic Patents*, J. ECON. PERSPS., Spring 2005, at 75, 75.

152. Lemley, *supra* note 134, at 25.

153. *See* Cotter et al., *supra* note 4, at 34 ("There are nonetheless significant practical and conceptual problems involved with using comparable licenses — even 'established' ones — as evidence of a reasonable royalty."). Cotter et al. go on to note the difficulty of identifying such a multiplier in any given case, however. *Id.* at 39 ("It therefore would appear very difficult in most cases to reliably enhance the actual royalty arrived at in prior comparable licenses . . . .").

154. *See, e.g.*, Brian J. Love & Christian Helmers, *Are Market Prices for Patent Licenses Observable? Evidence from 4G and 5G Licensing*, 24 COLUM. SCI. & TECH. L. REV. 55, 60 (2022) (using 4G and 5G patent licensing agreements to underscore the difficulty of valuing a single patent from real-world deals).

what is claimed in the asserted patent.[155] The royalty of the prior license must be carefully analyzed to determine what portion was attributable to the technology at issue in the prior license (and not to the other types of factors and considerations identified above) before the factfinder can use the license to make any determination as to the appropriate royalty for the patent-in-suit as specifically used in the accused product in litigation.

Consider again a patent covering some aspect of a microprocessor, such as an incremental improvement to the ability to delete audio files. Assume that the patentee previously asserted her patent along with five other patents against a microprocessor manufacturer. After two years of litigation, millions of dollars in attorney fees, and the risk of millions more, the parties settled. As part of the settlement, the patentee granted the microprocessor manufacturer a license to more than one hundred of the patentee's patents across multiple countries; the microprocessor manufacturer granted the patentee a license to one of its own patent portfolios; the microprocessor manufacturer agreed to pay a royalty equal to a small percentage of the value of the microprocessors sold by the manufacturer; and both parties agreed to withdraw all litigation claims. If the same patent is later asserted in another case, it would be inaccurate and improper to assume that the payment in this agreement is a properly apportioned measure of damages that — consistent with *McCormick* and *Garretson* — reflects only the value of the patented feature in the products at issue in the second case.

First, the agreement includes the value of the litigation settlement and more than one hundred patents — it is not limited to the value of the single audio file deletion patent.[156] The value of one patent typically will not be the same as the value of one hundred patents — the Federal Circuit has stated that parties cannot assume that an infringed patent has no value[157] (even though patentees may lose the right to

155. *See supra* Section III.A.

156. *See* Uniloc USA, Inc. v. Microsoft Corp., 632 F.3d 1292, 1320 (Fed. Cir. 2011); *see also* Lee & Melamed, *supra* note 2, at 418 ("[V]irtually all licenses — even those that do not arise directly out of litigation — are negotiated in 'the shadow of the law' and reflect the parties' litigation expectations."); Christopher S. Storm, *Standard Essential Patents Versus the World: How the Internet of Things Will Change Patent Licensing Forever*, 30 TEX. INTELL. PROP. L.J. 259, 302 (2022) ("License negotiations are not academic exercises where both parties are focused on achieving the correct outcome consistent with all legal constraints and representative of the value being conferred."); Storm, *supra* note 18, at 207 (explaining that "built-in apportionment" is improper, as "[l]icense negotiations are influenced by a variety of factors having nothing to do with the value of the asserted patent").

157. *See, e.g.*, Dow Chem. Co. v. Mee Indus., Inc., 341 F.3d 1370, 1381–82 (Fed. Cir. 2003); Info-Hold, Inc. v. Muzak LLC, 783 F.3d 1365, 1372 (Fed. Cir. 2015) (citing *id.*); Apple Inc. v. Motorola, Inc., 757 F.3d 1286, 1328 (Fed. Cir. 2014), *overruled by* Williamson v. Citrix Online, LLC, 792 F.3d 1339 (Fed. Cir. 2015).

seek damages on any given patent if they fail to present sufficient damages evidence).[158] Second, the agreement involved the products of the microprocessor manufacturer in the settled case, not the products of the defendant in the second case. The fact that the parties to the prior agreement agreed to a royalty of X percent of the revenues of the specific microprocessors at issue does not mean that the patent is responsible for the same percentage value of another product. For instance, a 0.1% royalty rate may make sense for the use of the audio file deletion invention in an MP3 player, but not in a server that has many more unpatented components and features.

Third, the terms of the agreement may have been influenced by the patentee's litigation campaign. Patent holders, particularly NPEs that acquire patents for monetization, have an incentive to structure agreements to include terms that may help them assert the patent against other defendants.[159] For instance, a patentee may agree to a litigation settlement agreement with a small microprocessor manufacturer for a low dollar amount, but may structure the license terms to have a high percentage or per-unit royalty rate applied against a limited royalty base. The licensee may have little incentive to resist because its focus is primarily on the bottom-line payment amount. And the patentee can then try to use the artificially inflated rate as a benchmark in negotiations or litigations against other larger targets.[160]

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158. *Apple*, 757 F.3d at 1328 ("[A] fact finder may award no damages only when the record supports a zero royalty award. For example, in a case completely lacking any evidence on which to base a damages award, the record may well support a zero royalty award."); *see also* MLC Intell. Prop., LLC v. Micron Tech., Inc., 10 F.4th 1358, 1371–72 (Fed. Cir. 2021). Mr. Lee represented an amicus in the *Micron* case.

159. As Lee & Melamed explained:

> Patent holders, knowing that their licenses will influence royalty awards in future litigation, have an incentive to structure their agreements in ways that exaggerate the apparent cost of the licenses to the licensees . . . . The licensee will generally have little or no incentive to resist such a disproportionate allocation because it will have a license and will not be affected by the patent holder's use of the license as a benchmark in negotiations or litigation with other technology users.

Lee & Melamed, *supra* note 2, at 418; *see also* 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) ("The potential for this mischief has been recognized by practicing lawyers, who have recommended that 'if your company is a defendant in a multi-defendant case, you may be able to entice the patent owner to settle for a lower dollar amount in exchange for structuring your settlement to reflect a high effective royalty rate that the patentee can use in pursuing other larger defendants.'"); Storm, *supra* note 18, at 207 (noting the assumption that parties negotiating prior license agreement "negotiated [solely] over the value of" a particular patent is "dangerous because it allows patent owners to avoid apportioning value in future cases if they successfully forced past licensees to sign agreements that did not appropriately apportion value").

160. Keele, *supra* note 159, at 228.

Patentees may also use other techniques to obscure the actual price paid where there is a strategic benefit to doing so.[161]

Another strategy NPEs have exploited to manipulate the apportionment process is to purchase a patent from an operating company for a small amount, assert the patent against a defendant, and then argue that the low purchase price should be ignored because the hypothetical negotiation would have predated the sale to the NPE. The NPE argues that the patent is extremely valuable and warrants a large damages award because the hypothetical negotiation would have been between the larger operating company and the accused infringer, not between the NPE and the accused infringer.

To be clear, an agreed-upon royalty for the patent-at-issue can reflect the value of the licensed patent in some circumstances. But as the Federal Circuit has stated, "Prior licenses . . . are almost never perfectly analogous to the infringement action."[162] And the use of licenses that calculate royalties based on the value of a multi-component product raises a particular danger that patentees will be allowed to recover damages based on unpatented features. As the discussion above in Section III.A shows, Federal Circuit caselaw before 2014 guarded against this possibility by (1) carefully scrutinizing the use of any such license to ensure there is a rigorous apportionment analysis that allows damages only for the value of the asserted patents (i.e., an analysis that carefully accounts for different patents, different products, and different economic circumstances); and (2) not permitting the plaintiff to introduce to the jury the defendant's total revenue for the accused product, which *Uniloc* found would be inherently prejudicial.

But since 2014, the Federal Circuit and many district courts have eased their scrutiny of licenses in damages analyses, thereby opening the door for implicit abandonment of the apportionment principle. Rather than using earlier comparable licenses as evidence of the proper royalty only after the plaintiff took the additional step of adjusting the prior royalty to reflect the incremental value of the relevant feature in the accused product in litigation, courts have increasingly allowed patentees to use the total consideration paid for a license that includes more than the licensed technology to calculate damages. Courts have done so without the apportionment safeguards insisted upon in prior caselaw based on the patentee's assertion that apportionment was somehow built into the calculation such that no further apportionment

161. *See* Love & Helmers, *supra* note 154, at 79–80; *see also* Christian Helmers & Brian J. Love, Are Non-Practicing Entities Opportunistic? Evidence from Litigation of Standard-Essential Patents 7 (Aug. 4, 2023) (unpublished manuscript), https://papers.ssrn.com/sol3/papers.cfm?abstract_id=4540908 [https://perma.cc/48s9-gzhd].

162. Ericsson, Inc. v. D-Link Sys., Inc., 773 F.3d 1201, 1227 (Fed. Cir. 2014).

is necessary. This undermining of the apportionment requirement has developed in three stages.

a. Stage 1: Ericsson v. D-Link *and* CSIRO v. Cisco *Open the Door to "Built-in Apportionment"*

In a pair of decisions in the mid-2010s — *Ericsson, Inc. v. D-Link Systems, Inc.*[163] and *Commonwealth Scientific & Industrial Research Organisation v. Cisco Systems, Inc.* ("CSIRO")[164] — the Federal Circuit allowed plaintiffs to calculate damages using prior licenses that were tied to the entire value of the licensed products without requiring a rigorous apportionment analysis.

In *Ericsson*, Ericsson sued D-Link and others, alleging that D-Link's laptops, routers, and other devices infringed patents related to Wi-Fi technology.[165] Ericsson's expert calculated damages based on prior Ericsson portfolio license agreements that were "tied to the entire value of the licensed products" — i.e., multi-component, end-user products such as routers and laptops[166] — even though the prior license included dozens of patents and the asserted claims of the patents-in-suit were practiced only by the Wi-Fi chips of the accused products.[167] The expert "assumed that the Patents-in-Suit represent at least 50 percent of the total value of" the portfolio (even though they were a much smaller percentage of the patents in that portfolio) and reduced his per-unit rate accordingly to arrive at his ultimate damages number.[168] The jury found infringement and awarded roughly $10 million in damages, and the district court held that $0.15 per infringing product was an appropriate ongoing royalty rate for the three infringed patents.[169]

The Federal Circuit upheld this methodology, treating the issue of apportionment as largely a matter that the trial court can leave to the jury, provided that the trial court gives the jury proper instructions. Specifically, the Federal Circuit stated that a district court "should give a cautionary instruction regarding the limited purposes for which [testimony about the value of a multi-component product] is proffered" and "should also ensure that the instructions fully explain the need to apportion the ultimate royalty award to the incremental value

163. 773 F.3d 1201 (Fed. Cir. 2014). Mr. Lee represented a party in the *Ericsson* case.

164. 809 F.3d 1295 (Fed. Cir. 2015). Mr. Lee represented amici in the *CSIRO* case.

165. *Ericsson*, 773 F.3d at 1207, 1211–12.

166. *Id.* at 1225; Ericsson Inc. v. D-Link Corp., No. 10-CV-473, 2013 WL 2242444, at *1 (E.D. Tex. May 21, 2013).

167. *See Ericsson*, 2013 WL 2242444, at *2.

168. *See id.* at *3, *3 n.3.

169. *Ericsson*, 773 F.3d at 1207–08, 1225.

of the patented feature from the overall product."[170] But with those limited caveats, the Federal Circuit held that the expert's testimony was admissible:

> [W]here expert testimony explains to the jury the need to discount reliance on a given license to account only for the value attributed to the licensed technology . . . the mere fact that licenses predicated on the value of a multi-component product are referenced in that analysis . . . is not reversible error.[171]

The Federal Circuit left the issue of apportionment entirely to the jury without engaging in an independent review of the expert's damages analysis.[172]

In *CSIRO*, the Federal Circuit similarly endorsed a less disciplined apportionment analysis. The plaintiff CSIRO alleged that Cisco infringed a patent directed to wireless technology.[173] Following a bench trial, the district court adopted a damages theory based on the fact that the parties had previously discussed Cisco taking a license to the patent-in-suit.[174] Because Cisco had informally suggested $0.90 per end unit as a possible royalty in those negotiations, the court set $0.90 per unit as a lower bound on a reasonable royalty.[175] The district court then applied its determined rate to the accused products, resulting in a damages award of $16 million.[176] The court reached this conclusion without engaging in any apportionment analysis to determine what factors beyond the value of the asserted patent might have been reflected in rates that the parties discussed in negotiations.[177] The Federal Circuit affirmed, rejecting Cisco's argument that the district court violated the apportionment requirement by valuing the asserted patent with reference to end-product licensing negotiations.[178] Instead, because the parties' prior discussions involved a potential license to the patent-in-suit, the Federal Circuit reasoned that the "starting point for the district court's analysis already *built in* apportionment."[179] The court concluded, without citing any support, that

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170. *Id.* at 1228.

171. *Id.*

172. *See id.*

173. Commonwealth Sci. & Indus. Rsch. Organisation v. Cisco Sys., Inc., 809 F.3d 1295, 1297 (Fed. Cir. 2015).

174. *Id.* at 1300.

175. *Id.* at 1303. For the upper bound, the district court looked to the $1.90 per-unit rate requested by CSIRO in its public "Rate Card." *Id.* at 1299–1300.

176. *Id.* at 1300.

177. *Id.* at 1299–1301, 1303.

178. *Id.* at 1300–01, 1303.

179. *Id.* at 1303 (emphasis added).

"the parties negotiated over the value of the asserted patent, 'and no more.'"[180]

The outcomes in *Ericsson* and *CSIRO* were not entirely unreasonable, given the particular facts of those cases. In *Ericsson*, the prior agreements included licenses between the plaintiff and parties similarly situated to the defendants (e.g., other manufacturers of laptops and routers) for patent portfolios that included the patents asserted in the litigation; the expert purported to adjust the rates from the prior agreements to account for the value of non-asserted patents in those portfolios; and the expert described the apportionment requirement to the jury.[181] And in *CSIRO*, the damages calculation was rooted in previous negotiations between the same two parties involved in the litigation; those negotiations focused on the same patent and same products at issue in the litigation; and there was no concern regarding the jury hearing prejudicial total revenue figures because the judge determined the royalty following a bench trial.[182] Moreover, the *CSIRO* court recognized that, although the district court was allowed to start its analysis with the prior royalty, the court "still may need to adjust the negotiated royalty rates to account for other factors."[183]

But the opinions in these two cases opened the door to the more troubling "built-in apportionment" cases that followed. *CSIRO* used the term "built in" apportionment as a description of certain context-dependent facts that were found in that case. But because neither *Ericsson* nor *CSIRO* suggested what the plaintiff must do to demonstrate that other licenses or license negotiations on which they base their damages claims satisfy the apportionment requirement or how the referenced royalty rates should be adjusted, lower courts have reified that factual description and treated it as a legal principle — as if a "comparable license" can be deemed as a matter of law to solve the apportionment requirement. This allowed plaintiffs to base their damages analyses on prior royalty payments that covered multi-component products — and then leave it to the jury to determine whether the plaintiff's expert had sufficiently revised the royalty downward to account for non-patented features. Rather than requiring a patentee to carefully prove that its damages analysis reflected the value of patented features, the burden on apportionment began to shift to defendants. And by permitting plaintiffs to start the damages analy-

180. *Id.* (quoting Ericsson, Inc. v. D-Link Sys., Inc., 773 F.3d 1201, 1226 (Fed. Cir. 2014)); *Ericsson*, 773 F.3d at 1228 (stating that because Ericsson's expert had "take[n] into account . . . apportionment principles" in his testimony, the damages award did not violate apportionment).

181. *Ericsson*, 773 F.3d at 1225–28.

182. *CSIRO*, 809 F.3d at 1300–03.

183. *Id.* at 1303.

sis with large, unapportioned royalty figures, the Federal Circuit allowed the prejudicial "anchoring" effect that unavoidably results from using an excessive starting point.[184]

The Federal Circuit's decisions in *Ericsson* and *CSIRO* thus began a significant shift in the balance in patent damages law.

b. Stage 2: Elbit v. Hughes *and* Bio-Rad v. 10X Genomics *Continue to Embrace "Built-in Apportionment"*

After *Ericsson* and *CSIRO*, the Federal Circuit took "built-in apportionment" significantly further in 2019 and 2020. In *Elbit Systems Land & C4I Ltd. v. Hughes Network Systems, LLC*[185] and *Bio-Rad Laboratories, Inc. v. 10X Genomics Inc.*,[186] the court permitted patentees to assume that apportionment is "built in" even where the prior license agreement involved different parties, different patents, and different products than the hypothetical license to the asserted patent.

In *Elbit*, the patentee alleged that Hughes infringed patents related to satellite communication technology.[187] Elbit's expert calculated damages based on an allegedly comparable prior litigation settlement agreement that Hughes had negotiated with a third party for one of Hughes's patents.[188] The plaintiff's expert started with the prior Hughes settlement agreement's rate and, without attempting to "parse out a value for each of the claims" or account for the fact that the agreement involved different products than those accused in the present case, assumed that apportionment was "implicitly considered" in the Hughes agreement's royalty rate.[189] He then increased the Hughes agreement's rate to arrive at a $18 per-unit figure for a license to the asserted patents.[190] The jury found infringement, adopted the expert's rate, and awarded $21 million in damages.[191] On appeal, the Federal Circuit held that this approach did not violate apportionment principles, crediting the expert's testimony that apportionment "is essentially embedded in [the] comparable value" from the prior agreement,

184. *Cf.* Yun-chien Chang, Kong-Pin Chen & Chang-Chin Lin, *Anchoring Effect in Real Litigation: An Empirical Study* 4 (Coase-Sandor Working Paper Series L. & Econ., Working Paper No. 744, 2016).

185. 927 F.3d 1292 (Fed. Cir. 2019).

186. 967 F.3d 1353 (Fed. Cir. 2020).

187. *Elbit*, 927 F.3d at 1294.

188. *Id.* at 1300. The asserted patent was directed to a system for transmitting information from user terminals to a central hub using satellite communication. *Id.* at 1294. The products at issue were certain Hughes satellite communication platforms that provided broadband Internet services via satellite. *Id.* at 1296.

189. *Id.* at 1300–01; *see also id.* at 1301 (expert testimony that apportionment "is essentially embedded in [the] comparable value" from the prior agreement).

190. *Id.* at 1300, 1302.

191. *Id.* at 1295, 1300.

and concluding that "when [the expert] used the [Hughes] Agreement as his starting point, his analysis could reasonably be found to incorporate the required apportionment."[192]

The Federal Circuit in *Elbit* thus allowed the patentee to end run any real apportionment analysis. The Federal Circuit stated that *CSIRO* had upheld a "built-in apportionment" because the analysis "start[ed] from 'discussions centered on a license rate' for the same patent and concluded that those discussions already implicitly apportioned the proposed license rates to the value of the patented technology."[193] And the court then concluded that the facts in *Elbit* were "relevantly similar."[194] But the prior licensing discussions in *CSIRO* involved the same parties and the same patent, and they occurred outside the context of litigation. The prior agreement in *Elbit* was vastly different, and while the court said in conclusory terms that the plaintiff had "attended to" all the differences,[195] the facts are quite distinct:

(1) The prior license involved different patents, parties, and products. The prior agreement was actually a license in which the defendant (Hughes) was the *licensor*, yet the expert was allowed simply to assume that the agreement reflected what Hughes would have paid *as a licensee* for a different patent.[196]

(2) The prior license was a litigation settlement (which, as discussed above, includes the value to resolve the cost and uncertainty of litigation),[197] but the patentee's expert merely paid lip service to that issue, without making any actual adjustment to the royalty.

(3) The court allowed the expert to assume built-in apportionment even though the prior license related to the value of a patented invention in a different third-party product, not the accused Hughes product.[198]

(4) The court approved of the expert *increasing* the royalty rate from the prior agreement based on the fact that the accused Hughes product (two-way communications) was more advanced than the older product at issue in the prior license (one-way communications), without any analysis by the

192. *Id.* at 1301.

193. *Id.* (quoting Commonwealth Sci. & Indus. Rsch. Organisation v. Cisco Sys., Inc., 809 F.3d 1295, 1303 (Fed. Cir. 2015)).

194. *Id.*

195. *Id.* at 1300.

196. *See id.*

197. *Id.*

198. *See id.*

> court to determine or confirm that the *patent-in-suit* was responsible for the extra value created by that advancement from one-way to two-way communications — thereby giving the patentee exactly the type of reward that the apportionment principle is designed to prevent.[199]

In effect, the Federal Circuit in *Elbit* shifted the burden to the defendant to prove that the plaintiff's analysis was deficient — even commenting that "Hughes introduced no evidence that precluded" a finding of built-in apportionment.[200]

The *Elbit* decision demonstrates the danger of the "built-in apportionment" idea. *Elbit*'s affirmation of "built-in apportionment" enabled the court to ignore the fundamental differences in the patents at issue, the parties involved, and the products accused. It also enabled the court to ignore the different circumstances and imperatives that lead to license agreements in the real world. Instead, the court accepted what amounted to hand waving by an expert claiming that apportionment was "built in."

The Federal Circuit went even further in *Bio-Rad*, ruling that a patentee may rely upon the royalty from a prior license without making any adjustment to the negotiated rate at all. There, the patentee's expert based his damages calculation on allegedly comparable prior license agreements, none covering the asserted patents.[201] The primary agreement on which the damages award was based was one in which a third-party licensee had agreed to pay another third party a fifteen percent royalty rate to license more than five hundred patents under limited conditions (i.e., if the licensee and the licensor became direct competitors).[202] Although that fifteen percent rate was never actually paid under that license, and despite the massive difference in the number of patents covered by the license (over five hundred) and the number of patents at issue in the litigation (three),[203] Bio-Rad's expert adopted the fifteen percent royalty rate from that agreement and, after concluding that no adjustments to the rate were needed un-

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199. *See id.* (noting that the expert "relied on the per-unit figure in the [prior license] for one-way technology, together with Hughes-based evidence that two-way technology was worth at least an additional 20%, to arrive at his proposed per-unit figure — which the jury adopted")

200. *Id.* at 1301.

201. Bio-Rad Lab'ys, Inc. v. 10X Genomics Inc., 967 F.3d 1353, 1373–74 (Fed. Cir. 2020). The asserted patents were directed to systems and methods for forming microscopic droplets of fluids to perform biochemical reactions which are used, for instance, in medical diagnostics. *Id.* at 1360. The accused products were five product lines, each of which used a hardware instrument, microfluidic chips used on those hardware instruments, and a variety of specialized reagents. *Id.* at 1361–62.

202. *Id.* at 1375.

203. *Id.*

der *Georgia-Pacific*, applied the rate to all of the defendant's accused revenues.[204] The jury found infringement and awarded nearly $24 million in damages, the full amount Bio-Rad requested.[205] The Federal Circuit affirmed, holding that this approach did not violate the apportionment requirement.[206] The court again took a hands-off approach and held that it was enough that the expert "assess[ed] whether the importance of [the] technology to the particular license was similar to the hypothetical negotiation" and that "the proportion of licensed/unlicensed features was comparable to the present case," relying "on the reports, testimony, and conclusions of other witnesses" to conclude that "no adjustment . . . was required."[207] This analysis, the court found, "could reasonably be found to incorporate the required apportionment."[208]

Bio-Rad thus further undermined the apportionment requirement. Despite the many differences between the prior license and the facts in the *Bio-Rad* case (e.g., different parties, different products, vastly different number of patents), the Federal Circuit simply allowed the expert to adopt wholesale the royalty structure from the prior agreement. The result is that, under *Bio-Rad*, a patentee's damages expert need not make *any* adjustments to the royalty in a prior agreement so long as the expert claims the prior agreement to be "comparable" and the expert purports to "assess[]" any differences — regardless of whether the expert makes any actual adjustments in the face of significant differences.[209]

c. Stage 3: Vectura v. GSK *Swallows Up Apportionment*

In *Vectura Ltd. v. GlaxoSmithKline LLC*,[210] the Federal Circuit reaffirmed the proposition that patentees may rely on "built-in apportionment" even where the prior license agreement involved different patents and products.[211] And it took another step that further disrupted the delicate balance that existed in patent damages law: the court actually endorsed a patentee referring at trial to the accused product's entire value, even where the entire market value rule indisputably does not apply.[212]

204. *Id.* at 1377.
205. *Id.* at 1372.
206. *Id.* at 1377.
207. *Id.*
208. *Id.*
209. *See id.* at 1372–73.
210. 981 F.3d 1030 (Fed. Cir. 2020).
211. *See id.* at 1040–41.
212. *Id.* at 1041.

At trial, Vectura asserted just one claim with one patent against defendant GlaxoSmithKline's ("GSK's") medical inhalers.[213] Vectura's damages theory, however, focused on a 2010 agreement in which Vectura granted GSK a license to more than four hundred patents with a royalty structure where GSK agreed to pay a three percent royalty on sales of licensed products until sales reached a certain amount.[214] Even though the 2010 license covered vastly more patents and different products, and included a royalty cap, Vectura's damages expert adopted without alteration the 2010 license's royalty base (i.e., total revenue on sales of accused products) and its three percent rate — and eliminated the royalty cap.[215] The expert testified that she had "considered" whether differences between the 2010 agreement and the hypothetical license — e.g., the fact that the 2010 deal covered more than four hundred patents — required adjustments to the damages calculation, and concluded that they did not.[216] The jury found infringement and awarded Vectura a three percent royalty on a base of $2.99 billion in total sales, resulting in $89 million in damages.[217]

GSK appealed, arguing that Vectura's use of total sales of accused products violated the apportionment requirement, and that Vectura's reference to GSK's total revenue for those products was improper under *Uniloc*.[218] The Federal Circuit rejected both arguments. First, citing *Bio-Rad*, *Elbit*, and *CSIRO*, the court concluded that the expert appropriately applied "built-in apportionment":

> Built-in apportionment effectively *assumes* that the negotiators of a comparable license settled on a royalty rate and royalty base combination embodying the value of the asserted patent . . . . *[A] party relying on a sufficiently comparable license can adopt the comparable license's royalty rate and royalty base without further apportionment* and without proving that the infringing feature was responsible for the entire market value of the accused product.[219]

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213. *Id.* at 1032–33.

214. *Id.* at 1039–40. The asserted patent was directed to "the production of 'composite active particles' for use in pulmonary administration, such as in dry-powder inhalers." *Id.* at 1032. Vectura alleged infringement by GSK's Ellipta-brand inhalers base on certain mixtures in the inhalers. *Id.* at 1033.

215. *Id.* at 1040.

216. *Id.* at 1041.

217. *Id.* at 1034.

218. *See id.* at 1041, 1043–44.

219. *Id.* at 1041 (emphasis added).

Because the court concluded that the 2010 agreement was "sufficiently comparable" to the hypothetical license to the asserted patent, it found that there was no need to show that the patented feature was responsible for the accused products' total market value, or to show any further apportionment.[220]

Second, the court disagreed that Vectura's references to GSK's total revenues warranted a new trial. The Federal Circuit found that Vectura had made three such references that were objectionable — what the court labeled "pennies on the dollar" arguments — but did not find these comments sufficiently prejudicial to overturn the verdict.[221] The court went on to conclude that other references by the plaintiff to total sales "were not objectionable because it was *necessary* for Vectura to reference GSK's total sales . . . considering that Vectura's damages theory asked the jury to multiply the three-percent royalty rate by the royalty base, i.e., GSK's total sales."[222]

In many respects, *Vectura* demonstrates that the "built-in apportionment" exception has swallowed the apportionment rule. Patentees have asserted that under *Vectura*, they should be permitted to import royalty rates from allegedly "comparable" license agreements and use the entire value of an accused product in calculating damages, without any meaningful analysis that isolates the contribution of the claimed invention to the specific accused product.[223] This is exactly what apportionment was designed to prevent. Patentees' experts have asserted that apportionment is deemed to be "built in" to historical licenses — even where the licenses involved different parties, different patents, and/or different products — and courts have permitted damages awards to be based on the prior royalty terms without any modification despite those differences. Further, despite *Uniloc*'s clear recognition that reliance on an accused product's entire market value to

220. *Id.*

221. *Id.* at 1043–44.

222. *Id.* at 1044 (emphasis added); *see id.* ("In particular, it was legitimate for [the expert] to reference GSK's total sales when calculating her proposed damages award because her royalty base was the total sales of the accused inhalers."). According to the court, it was "proper" for the expert "to refer to the sales figures when analyzing the comparability of the 2010 license and the 2016 hypothetical negotiation — *an analysis critical to any built-in apportionment theory*." *Id.* (emphasis added).

223. *See* NNCrystal US Corp. v. Nanosys, Inc., No. 19-CV-1307, 2023 WL 2891453, at *2–4 (D. Del. Apr. 11, 2023) (plaintiff's expert argues for "built in apportionment" without adjusting payment in licenses covering many patents other than the asserted patent); IOENGINE, LLC v. PayPal Holdings, Inc., 607 F. Supp. 3d 464, 500 (D. Del. 2022) (plaintiff argues that "'built-in apportionment' satisfies the apportionment requirement" even though licenses covered different technologies than the hypothetical negotiation); Epistar Corp. v. Lowes Cos., Inc., No. 17-CV-03219, 2022 WL 18911616, at *15–17, *16 n.8 (C.D. Cal. Oct. 4, 2022) (plaintiff's damages expert relies on "built-in apportionment" and does not adjust number to account for differences in the licensed technologies or the number of licensed patents).

calculate damages unfairly "skew[s] the damages horizon,"[224] patentees have now successfully argued that, under *Vectura*, they can use this evidence to support a built-in apportionment theory.

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The series of Federal Circuit cases from *Ericsson* to *Vectura* significantly weakened the apportionment requirement, allowing patentees to advance damages theories disconnected from the facts of the case and to recover large awards without anything like the methodical evidentiary showings required before 2014. The result is that plaintiffs have made an end run around apportionment, claimed damages using payments not at all limited to the incremental value of the asserted patents, and obtained windfall damages.

This is problematic both economically and legally. Allowing plaintiffs to use unapportioned payments from prior licenses covering far more than the asserted patents does not make economic sense. It is no more economically justifiable than calculating the property tax value of an apartment based on the prior sales price of an entire apartment building in a different city. And as a legal matter, allowing patentees to introduce evidence of total product revenues distorts the jury's analysis and encourages damages far beyond the footprint of the invention. In the authors' experience, the introduction of "big numbers" can and does sway a jury.[225]

Worse still, patentees can and do manipulate the way their licenses are written to maximize damages in later litigation. This manipulation can happen in a number of ways. A patentee intent on bringing a group of lawsuits will often start with a suit or threat letter against small companies who don't have the incentive to fight. They may sign a deal with a license fee that recites a high percentage royalty because

224. Uniloc USA, Inc. v. Microsoft Corp., 632 F.3d 1292, 1320 (Fed. Cir. 2011).

225. This is a topic of ongoing academic debate. *See* Michael J. Chapman, *The Incremental Value of Apportionment in Reasonable Royalty Patent Damages Analysis*, 29 FED. CIR. BAR J. 49, 99 (2019) (arguing that "the widely-shared concern expressed by courts that consideration of the full value of the accused product is likely to skew damages is, in fact, merely an assumption whose relevance and applicability should be determined in each relevant case"); Thomas F. Cotter, *Patent Damages Heuristics*, 25 TEX. INTELL. PROP. L.J. 159, 202 (2018) ("[A]lthough the cognitive biases that advocates of the SSPPU invoke may be well-documented in many settings, whether they are likely to affect the calculation of damages within the formal setting of a trial remains a hypothesis, not a proven fact."); David J. Teece & Edward F. Sherry, *On the "Smallest Saleable Patent Practicing Unit" Doctrine: An Economic and Public Policy Analysis* 9 (Tusher Ctr. for Mgmt. Intell. Cap. Working Paper Series, Paper No. 11, 2016), https://ssrn.com/abstract=2764614 [https://perma.cc/MDJ8-ABHK] ("The fact that patent holders often advocate for the use of a larger royalty base, while accused infringers often advocate for the use of a narrower royalty base, lends credence to the idea that *litigants* believe that framing and/or anchoring matters.").

the actual amount at stake is very small. That is especially true if the initial defendant no longer makes the product, so they don't face any ongoing liability. For example, a patentee with a patent on a small component may want to target a company with $1 billion in sales of a large, multi-component product. But if they can first sue a company that sold only $1 million and is no longer in business, that company may be willing to settle for, say $300,000 — a nuisance-value fee that is far less than it would cost to invalidate even a very weak patent in court. By structuring the license as a thirty percent royalty, rather than a $300,000 flat fee, the patentee now has a "comparable" license to point to when it sues the $1 billion company.

Other variants of this strategy work when patentees sue and settle with companies for a small, fixed fee, but the license recites (accurately or not) that the fee represents a large percentage of either revenues or profits. In *Pavo Solutions v. Kingston Technologies*,[226] for example, the Federal Circuit held that the district court did not abuse its discretion in declining to exclude damages testimony that relied on a non-payment term in a license.[227] The plaintiff presented a reasonable royalty theory with a forty-cent per-unit rate, using license negotiations between CATR, which was the prior patent holder, and a company called IPMedia.[228] Both parties agreed this prior license was comparable, and it included a one-cent running royalty for sales of the product and a representation that this was twenty-five percent of the profits.[229] The plaintiff's expert opined that a profit-split model was appropriate to use as a factor in determining damages, reduced it to 18.75% because of differences in profitability, and argued that this resulted in a forty-cent per-unit rate when applied to the defendant's profits.[230] The defendant argued this relied not on the payment term, which was one cent per unit, but on a nonbinding representation that this represented twenty-five percent of the defendant's profits.[231] The court held this was not unduly speculative, as the representation merely provided context for the royalty and was not a separate payment provision.[232]

The defendant next argued that the plaintiff's expert failed to apportion for non-infringing features, as its total cost for the product materials were less than the proposed royalty, making the royalty for the component in excess of one hundred percent.[233] The court rejected

226. 35 F.4th 1367 (Fed. Cir. 2022).
227. *Id.* at 1378.
228. *Id.* at 1379.
229. *Id.*
230. *Id.*
231. *Id.*
232. *Id.*
233. *Id.*

this and allowed the verdict, noting that the further apportionment is not required when a sufficiently comparable license is used, and that material costs are not the same as the value of the feature.[234] The court affirmed the jury award.

Pavo demonstrates that even where the parties agree that a particular license is comparable, the failure to apportion can lead to bad results. By allowing the patentee to rely on a nonbinding representation about what a small per-unit payment reflected in terms of defendant's profits, the court effectively converted a small royalty into a larger one. And its ruling on "built-in apportionment" prevented the court from making a reality check on the size of the resulting royalty.

d. A Bridge Too Far? Temporarily Rehabilitating Apportionment

In *Omega Patents, LLC v. CalAmp Corp.*[235] and *MLC Intellectual Property, LLC v. Micron Technology, Inc.*,[236] the Federal Circuit itself seems to have recognized that the "built-in apportionment" cases had gone too far. In *Omega*, the patentee argued that it had satisfied "built-in apportionment" based on its existing "policy" of offering the same five-dollar per-unit rate regardless of the specific patent licensed, and based on allegedly "comparable" license agreements.[237] The Federal Circuit rejected both arguments. As to the first, the court explained that Omega's "policy" said nothing about apportionment "between the patented improvement added to the [accused product] and the conventional features of [those products]."[238] And as to Omega's license-based argument, the court acknowledged that the prior agreements "could, in theory, provide a basis for a reasonable royalty if the license rate were properly apportioned."[239] But the court concluded that the patentee and its expert did not do the necessary work to account for "distinguishing facts" between the prior agreements and a hypothetical license to the single asserted patent.[240] At most, the expert had "*identified* such differences," which, the court held, was insufficient.[241]

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234. *Id.* at 1379–80.

235. 13 F.4th 1361 (Fed. Cir. 2021).

236. 10 F.4th 1358 (Fed. Cir. 2021). Mr. Lee represented an amicus in the *Micron* case.

237. *Omega*, 13 F.4th at 1377–79.

238. *Id.* at 1379. As the court recognized, accepting Omega's "policy"-based argument would "improperly permit Omega to hide behind its generic licensing arrangement to avoid the task of apportionment." *Id.* (citing LaserDynamics, Inc. v. Quanta Comput., Inc., 694 F.3d 51, 79 (Fed. Cir. 2012) ("[T]o prove a reasonable royalty, alleging a loose or vague comparability between different technologies or licenses does not suffice.")).

239. *Id.* at 1380.

240. *Id.* at 1380–81.

241. *Id.* at 1381.

Similarly, in *Micron*, the Federal Circuit rejected the patentee's built-in apportionment argument as conclusory.[242] The patentee's expert argued that there was "de facto no need to apportion" because the licenses on which he relied were "comparable."[243] The Federal Circuit again acknowledged that it had "previously approved the use of comparable licenses to account for apportionment" but, as in *Omega*, held that the expert had not done the necessary work.[244] Instead, the patentee's expert "provided no evidence or explanation for how the 0.25% royalty rate he derived from the [prior] agreement accounts for apportionment of [the] accused products."[245]

Omega and *Micron* are correct to impose more discipline on damages awards. And the decisions provide important guidance on what that discipline requires. As these cases recognize, patentees and their experts should not be permitted simply to say the magic words "built-in apportionment" and stop; they should be required to come forward with evidence separating damages between the patented feature and the unpatented ones.[246] Other courts have since applied *Omega* and *Micron* to strike down some "built-in apportionment" contentions by plaintiffs.[247]

The Federal Circuit took additional steps to block the most egregious violations of the apportionment principle in its recent *VLSI Technology LLC v. Intel Corp.*[248] decision. VLSI asserted two patents

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242. *See* MLC Intell. Prop., LLC v. Micron Tech., Inc., 10 F.4th 1358, 1374 (Fed. Cir. 2021).

243. *Id.*

244. *Id.* at 1374–75; *see Omega*, 13 F.4th at 1380–81.

245. *Micron*, 10 F.4th at 1374–75 (adding that expert "conducted no assessment of the licensed technology versus the accused technology to account for any differences").

246. *See* LaserDynamics, Inc. v. Quanta Comput., Inc., 694 F.3d 51, 67 (Fed. Cir. 2012).

247. *See* IOENGINE, LLC v. PayPal Holdings, Inc., 607 F. Supp. 3d 464, 502–03 (D. Del. 2022) ("[A]t least in broad strokes, [the expert] attempted to account for some of the differences between the [prior] license and the hypothetical negotiation in these cases. But those efforts are not sufficient."); Epistar Corp. v. Lowes Cos., Inc., No. CV17-03219, 2022 WL 18911616, at *16 (C.D. Cal. Oct. 4, 2022) ("As in *Omega*, identifying other licenses that cover a variety of patents and rights in exchange for a standard royalty rate, *e.g.*, $5.00 in that case, versus 3% or 5% here, is insufficient to determine or analyze whether those agreements reflect built-in apportionment for the value of patented features. Although [patentee's damages expert] testified that industry practice supported blanket rates . . . under *Omega* this is insufficient to analyze built-in apportionment. It does not distinguish between patented and non-patented features covered by the agreements."); *see also* Rex Med., L.P. v. Intuitive Surgical, Inc., No. 19-005, 2023 WL 6142254, at *7–11 (D. Del. Sept. 20, 2023) (rejecting a non-comparable license under *Daubert*, and ultimately remitting damages to $1 because plaintiff offered no other theory besides the non-comparable license: "This testimony fails to provide any basis from which a factfinder could assign any portion of the $10,000,000 to the '650 patent alone. . . . [T]here is nothing in the record that addresses the extent to which the '650 patent — as opposed to the '892 patent — contributes to the $10,000,000 sum.").

248. 87 F.4th 1332 (Fed. Cir. 2023). Mr. Lee represented a party in the *VLSI* case.

against Intel and had obtained a $2.2 billion trial verdict.[249] The Federal Circuit overturned the judgment. The court first reversed the infringement judgment of one of the asserted patents, erasing nearly $700 million of the jury's award.[250] As to the other patent, the Federal Circuit vacated the $1.5 billion jury award and remanded for a new trial on damages.[251] The court found that VLSI's damages experts had estimated the alleged benefits of the claimed invention by performing testing that included *non*-accused features, explaining that to try to show the purported benefits of the accused technology, VLSI's damages expert "used inputs that he chose by trying to match . . . data not from use of infringing functionality."[252] The court stated that "we cannot deem this step in the damages calculation harmless as to the bottom-line amount of damages" and therefore "[t]he damages award must be set aside . . . ."[253]

As a result, it appeared that the Federal Circuit would resurrect apportionment. But, as noted below, those hopes were soon dampened.

e. The Backslide Returns — EcoFactor, Inc. v. Google LLC

The Federal Circuit's June 2024 decision in *EcoFactor, Inc. v. Google LLC*[254] threatens to exacerbate the erosion of the principles of apportionment. In that case, the patentee's damages expert argued that three prior lump sum litigation settlement agreements supported an X%[255] royalty rate — a rate based on the agreements' unilateral "recitals" of the patentee's "belief" of what "is a reasonable royalty" [256] — and then applied that same rate to defendant's sales to arrive at his damages number.[257] The defendant challenged this methodology under *Apple Inc. v. Wi-LAN Inc.*[258] and *Omega Patents., LLC v. CalAmp Corp.*,[259] arguing, among other things, that each of the prior licenses covered non-asserted patents and yet the expert pulled the rate from the agreements without accounting for the value of the non-asserted patents.[260]

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249. *See id.* at 1335, 1339.
250. *Id.* at 1352.
251. *Id.*
252. *Id.* at 1348.
253. *Id.* at 1348–49.
254. 104 F.4th 243 (Fed. Cir. 2024).
255. The court redacted the actual percentage as confidential information.
256. 104 F.4th at 257–58 (Prost, J., dissenting in part).
257. *Id.* at 252.
258. 25 F.4th 960 (Fed. Cir. 2022).
259. 13 F.4th 1361 (Fed. Cir. 2021).
260. *EcoFactor*, 104 F.4th at 254–55.

The panel majority rejected the challenge, finding that the expert sufficiently accounted for the different scope of the licenses because he "acknowledged" that the prior agreements covered non-asserted patents, and said that (1) the defendant would have argued at the hypothetical negotiation that the inclusion of non-asserted patents in the prior agreements would have decreased the X% rate; (2) the fact that the parties to the hypothetical negotiation assume infringement and validity but the parties to the prior agreements did not have to make this assumption would have then increased the rate back to X%; and (3) the X% rate is further supported by the defendant's survey data that showed that more than X% of the defendant's profits is attributable to the accused functionality.[261] The majority then distinguished *Omega* and *Wi-LAN*, concluding that in *Omega*, the expert merely "identified" the fact that the prior agreements covered more than the asserted patents, without "accounting for" this difference and, in *Wi-LAN*, the expert simply "assum[ed]" without facts that the asserted patents drove the value of the prior agreements that covered more than the asserted patents.[262]

Judge Prost disagreed, writing in a strongly worded dissent that "the majority opinion here at best muddles our precedent and at worst contradicts it."[263] As Judge Prost explained, the patentee's expert "did not ask the necessary question under our law — what effect the *specific* non-asserted patents in [the patentee's patent] portfolio would have on the hypothetical negotiation."[264] And the expert's "generic" "circumstance-agnostic" testimony about patent licensing strategy — "that since, 'in the real world,' 'the rest of the patents are thrown in usually either for nothing or very little additional value,' the presence of these non-asserted patents would place 'downward pressure on the royalty rate' in a hypothetical negotiation" — was insufficient under settled apportionment law.[265]

EcoFactor is revealing for two reasons. First, the case threatens to erode the temporary progress of *Wi-LAN* and *Omega*. The majority's decision in *EcoFactor* could be read to suggest that simply acknowledging that the existence of non-asserted patents covered by prior agreements would put "downward pressure" on the royalty rate, and

261. *Id.*

262. *See id.* at 256–57.

263. *Id.* at 257 (Prost, J., dissenting). With respect to the selection of an $X royalty rate, Judge Prost explained: the expert's "rate rests on [the patentee's] self-serving, unilateral 'recitals' of its 'beliefs' in the license agreements. These recitals are not only directly refuted by two of those same agreements; they also have no other support (e.g., sales data or other background testimony) to back them up. Our law does not allow damages to be so easily manufactured." *Id.*

264. *Id.* at 261 (emphasis in original).

265. *Id.*

then asserting that any such pressure would be canceled out, could be enough to meet the apportionment requirement.[266] Second, the case shows that even within the Federal Circuit, there is recognition that the balance is askew.

f. District Court Contribution to Backsliding

Given the disagreement even within the Federal Circuit as to the level of analysis required for built-in apportionment, it should come as no surprise that district courts have contributed to the backsliding on apportionment principles. Patentees, including particularly NPEs,[267] have made extraordinary damages demands based on the theory.[268] And too often district courts have taken a hands-off attitude toward the damages evidence they have allowed plaintiffs to present to the jury. These district courts have allowed plaintiffs to use prior license agreements with large royalty payments without any substantive apportionment under the guise of "built-in apportionment."

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266. *Cf.* Omega Pats.., LLC v. CalAmp Corp, 13 F.4th 1361, 1379 (Fed. Cir. 2021) (recognizing that accepting a patentee's reliance on its licensing "policy" would "improperly permit Omega to hide behind its generic licensing arrangement to avoid the task of apportionment").

267. *See* Love & Helmers, *supra* note 154, at 69–70.

268. One recent case, in which a hedge-fund-backed NPE sought nearly $10 billion from Intel, is illustrative. *See* Memorandum Opinion at *2, Intel Corp. v. Future Link Sys., LLC, No. 14-377 (D. Del. June 8, 2017) (D.I. 621) (noting claim for $9.94 billion in damages on fourteen patents-in-suit); *see also* RPX, *After Its Recent Return to Litigation, IPValue's Future Link Systems Acquires More Patents from NXP*, RPX INSIGHTS (Feb. 8, 2021), https://insight.rpxcorp.com/news/65286-after-its-recent-return-to-litigation-ipvalue-s-future-link-systems-acquires-more-patents-from-nxp [https://perma.cc/45M5-WHK6]. In *Future Link*, for one set of patents-in-suit, Future Link's damages expert began with four allegedly comparable licenses and then conducted a "*Georgia-Pacific* analysis to determine whether any adjustments needed to be made" to the royalty rate, only to conclude that no adjustments were necessary. Memorandum Opinion, *supra*, at 3. The expert's report made no reference to apportionment, and the expert later asserted that apportionment was "embedded" in the licenses' royalty rate. Intel's Opening Brief in Support of Its *Daubert* Motion to Exclude Reasonable Royalty Opinions of Future Link's Damages Experts at 8–9, Intel Corp. v. Future Link Sys., LLC, No. 14-377 (D. Del. Mar. 06, 2017) (D.I. 541); *see also* Redaction of 617 Transcript. Official Transcript of Oral Argument Hearing held on April 25, 2017 before Chief Judge Leonard P. Stark at 14:21–15:2, Intel Corp. v. Future Link Sys., LLC, No. 14-377 (D. Del. July 17, 2017) (D.I. 634) (counsel for patentee arguing that "it is appropriate for an expert to determine . . . that the parties inherently apportioned as part of their negotiations"). The expert then applied the licenses' rate to the entire market value of Intel's accused products, resulting in a claim for $6.16 billion in damages based on just six of the asserted patents. Intel's Opening Brief, at 8; Memorandum Opinion, *supra*, at 2. The district court allowed the expert's testimony under Rule 702. *See* Dave Simpson, *Intel Settles Patent Row That Future Link Valued at $10B*, LAW360 (Aug. 18, 2017), https://www.law360.com/articles/955712/intel-settlespatent-row-that-future-link-valued-at-10b [https://perma.cc/MJU8-73ZG].

For instance, in *Opticurrent, LLC v. Power Integrations, Inc.*,[269] a Northern District of California court permitted the patentee's expert to import a royalty rate of three percent from an earlier license without any modification — despite the court's acknowledgment that the expert's discussion of the differences between the facts of the case and the circumstances of the earlier license was "not robust."[270] The district court summarized the testimony in a few paragraphs but failed to insist, either in its ruling on the post-trial motion or in its jury instructions, that the evidence really be sufficient, thus failing to supervise the trial with sufficient rigor.[271] The district court justified the result by citing the Federal Circuit's decision in *CSIRO* and stating that apportionment may be "already built into the royalty rate in a comparable license."[272] The Federal Circuit affirmed without opinion.[273]

Similarly, in *RSB Spine, LLC v. DePuy Synthes Sales, Inc.*,[274] which was decided after *Omega* and *Micron*, a District of Delaware court accepted the patentee's argument that apportionment was "built in" to the royalty rate from three prior agreements.[275] Although all three agreements were between the patentee and third parties, related to different products, and covered additional patents to those asserted, and two were entered to resolve litigation, the patentee's expert was allowed to import the six percent rate from the earlier licenses without modification.[276] According to the court, it was enough that the expert "addresse[d] the additional licensed patents and provide[d] reasoning for why he [did] not think they impact[ed] his overall calculation."[277]

While these district court cases are in many respects the natural consequence of decisions like *Vectura*, they are far afield from the Supreme Court's guidance that "in every case" damages must be limited to the specific footprint of the claimed invention.[278] And the problem remains particularly acute in cases brought by litigation-funded NPEs, where an NPE's only incentive is to assert the most

269. No. 17-CV-03597, 2019 WL 2389150 (N.D. Cal. June 5, 2019).

270. *Id.* at *8–9, *11.

271. *See id.* at *10–11.

272. *Id.* at *10.

273. *See* Opticurrent, LLC v. Power Integrations, Inc., 815 F. App'x 547 (Fed. Cir. 2020). Likewise, in *Imagenetix, Inc. v. Robinson Pharma, Inc.*, a Central District of California court allowed the plaintiff's expert to estimate damages based on the same royalty rate used in a prior licensing agreement between the plaintiff and a third party, without any substantive apportionment. No. 15-CV-599, 2018 WL 5880798, at *8 (C.D. Cal. June 12, 2018). The district court found this was acceptable because the expert "testified that this agreement 'already apportions' the value of [the patented agreement]." *Id.* The court simply accepted the expert's say-so and performed no further review. *Id.*

274. No. 19-1515, 2022 WL 17084156 (D. Del. Nov. 18, 2022).

275. *Id.* at *2.

276. *Id.*

277. *Id.*

278. Garretson v. Clark, 111 U.S. 120, 121 (1884).

substantial claim possible; because the NPE has no products or product revenues, it has no risk of a countersuit. And for the same reason, they have the strongest incentives to bias early settlements to leverage decisions like *Pavo*.

Although the Federal Circuit appears to have started to recognize the dangers of built-in apportionment in *Omega* and *Micron*, the application of built-in apportionment continues, and after *Pavo*, the problem is likely to get worse. Tolerance of "built-in apportionment" and the failure to apply apportionment principles consistently or rigorously have resulted in an explosion of litigation that is in furtherance of neither the delicate balance of the patent bargain nor the promotion of innovation and invention.

2. Failure to Apply *Daubert* and Rule 702 to Unreliable Damages Methodologies

In addition to acceptance of "built-in apportionment" contentions, courts have increasingly allowed patentees to sidestep apportionment in a second important way: by failing to consistently apply *Daubert* and Federal Rule of Evidence 702 to exclude unreliable expert apportionment theories.[279] This may be most evident in how courts have handled two types of statistical analysis that are increasingly popular in patent cases: regression analysis and conjoint survey analysis.

Daubert is fundamentally about reducing the likelihood that juries will be misled by specious testimony by purported experts. It necessarily rests on the premise that jury instructions are *not* sufficient for that purpose. Together with Rule 702, *Daubert* thus requires, as a matter of law, that the court act as a "gatekeeper."[280]

Daubert should have teeth. While courts and practitioners often cite to *Daubert*, many appear to forget how rigorous the *Daubert* standard was at its inception.[281] The Supreme Court in *Daubert* held that, before an expert analysis can be presented to the jury, the court must assess "whether the reasoning or methodology underlying the testimony is scientifically valid" and "properly can be applied to the

279. FED. R. EVID. 702; *see* Daubert v. Merrell Dow Pharms., Inc., 509 U.S. 579, 589 (1993); Kumho Tire Co. v. Carmichael, 526 U.S. 137, 141 (1999). Rule 702 provides that expert testimony is admissible only "if: (a) the expert's scientific, technical, or other specialized knowledge will help the trier of fact to understand the evidence or to determine a fact in issue; (b) the testimony is based on sufficient facts or data; (c) the testimony is the product of reliable principles and methods; and (d) the expert has reliably applied the principles and methods to the facts of the case." FED. R. EVID. 702.

280. *See* Apple, Inc. v. Motorola, Inc., 757 F.3d 1286, 1314 (Fed. Cir. 2014).

281. *See* Weisgram v. Marley Co., 528 U.S. 440, 455 (2000) (stating that *Daubert* established "exacting standards of reliability" for the admissibility of expert testimony); *see also* David E. Bernstein & Eric G. Lasker, *Defending* Daubert*: It's Time to Amend Federal Rule of Evidence 702*, 57 WM. & MARY L. REV. 1, 11 (2015).

facts in issue."[282] The Court explained that this can be determined, for example, by analyzing whether the methodology "can be (and has been) tested" in the relevant field;[283] whether the "theory or technique has been subjected to peer review and publication";[284] the "known or potential rate of error" the methodology has; and "general acceptance" in the relevant scientific community.[285]

As with apportionment, there are economic and legal justifications for this rule. As it applies to damages experts in patent cases, *Daubert* plays an important economic role. Jurors generally are not experts in finance or economics, and they can be misled by superficially convincing but flawed testimony by purported experts. The problem is compounded by the fact that, in many patent cases, jurors are asked to learn a complicated and unfamiliar technology, decide infringement and validity, and assess complicated damages models, all in a trial lasting less than a week. Jurors therefore need careful guidance when they are called upon to make a damages determination.

In this context, it is critical that the courts ensure that the damages evidence presented to the jury has a sound and reasonable economic foundation. Assume an expert's theory was that the jury should measure damages based on the number of inventors listed on the patent-at-issue. All would agree that this does not make sense. It would be an economically illogical result if the jury heard and accepted this theory, and *Daubert* is designed to prevent such a result. Basing damages on the number of named inventors has not been tested, peer reviewed, published, or generally accepted. It is not a scientifically valid methodology and should not be a basis for determining damages.[286]

That is where *Daubert*'s legal justification also becomes important. As a matter of evidence, before a theory or methodology is presented to the jury, it should be shown to be reliable and relevant.[287] It has long been recognized that unreliable and irrelevant evidence clouds and distorts the jury's decision making.[288] Nonsensical damages theories — e.g., linking the value of a patent to the number of inventors — have no place at trial other than to confuse the jury's

282. *Daubert*, 509 U.S. at 592–93.
283. *Id.* at 593.
284. *Id.*
285. *Id.* at 594.
286. *See id.* at 591–92 ("The study of the phases of the moon, for example, may provide valid scientific 'knowledge' about whether a certain night was dark . . . . [But it] will not assist the trier of fact in determining whether an individual was unusually likely to have behaved irrationally on that night. Rule 702[] . . . requires a valid scientific connection to the pertinent inquiry as a precondition to admissibility."), 592–94 (enumerating factors for reliability).
287. FED. R. EVID. 702.
288. *Daubert*, 509 U.S. at 591.

analysis. *Daubert* thus makes clear that district courts must act as "gatekeepers" to guard juries against misleading or unreliable expert testimony.[289] "Vigorous cross-examination, presentation of contrary evidence, and careful instruction on the burden of proof" alone are insufficient to avoid juries being swayed by dubious scientific and technical expert testimony.[290] Instead, Rule 702 "imposes a special obligation upon a trial judge to 'ensure that any and all scientific testimony . . . is not only relevant, but reliable'" *before* such testimony can be presented at trial.[291] Testimony that is not based on sufficient facts, or where the expert has not reliably applied her chosen methodology to the facts of the case, is to be excluded before it reaches the jury.[292]

Daubert has becoming increasingly important with respect to patent damages. As explained at the outset of this article, damages demands in patent cases have grown steadily in recently years, fueled by hedge-fund-backed NPEs.[293] Because these actors are risk-takers, and need just one large "hit" to continue to their pursuits, NPEs often advance outsized damages demands based on implausible theories. For example, in *Uniloc*, the plaintiff's expert offered testimony based on the so-called "25 percent rule of thumb."[294] This supposed "rule" simply declared that no matter how small the invention or how many other components there were to the product, a patentee should presumptively be entitled to twenty-five percent of the defendant's total profits. There is no logic or rigor to this rule of thumb. To ensure that the damages determination in patent cases remains economically and legally sound — and damages are properly apportioned to just the value of the patents at issue — courts should apply *Daubert* rigorous-

289. *Id.* at 589, 592–93; *see In re* Zurn Pex Plumbing Prod. Liab. Litig., 644 F.3d 604, 613 (8th Cir. 2011) ("The main purpose of *Daubert* exclusion is to protect juries from being swayed by dubious scientific testimony."); Deal v. Hamilton Cnty. Bd. of Educ., 392 F.3d 840, 851 (6th Cir. 2004) ("In *Daubert*, the Supreme Court held that district courts must act as 'gatekeepers' to protect juries from misleading or unreliable expert testimony by assessing the reliability of the expert's principles and methodologies used to reach the expert opinion or conclusion.").

290. *Daubert*, 509 U.S. at 596 ("These conventional devices . . . are the appropriate safeguards where the basis of [expert] testimony meets the standards of Rule 702."); *see* Nease v. Ford Motor Co., 848 F.3d 219, 231 (4th Cir. 2017) ("The fact that an expert witness was 'subject to a thorough and extensive examination' does not ensure the reliability of the expert's testimony; such testimony must still be assessed before it is presented to the jury.").

291. Kumho Tire Co. v. Carmichael, 526 U.S. 137, 147 (1999) (quoting *Daubert*, 509 U.S. at 589); *Nease*, 848 F.3d at 231 ("The district court's 'gatekeeping function' under *Daubert* ensures that expert evidence is sufficiently relevant and reliable *when it is submitted to the jury*." (emphasis in original)).

292. *See* FED. R. EVID. 702; *Daubert*, 509 U.S. at 589; *Kumho Tire*, 526 U.S. at 151; Sundance, Inc. v. DeMonte Fabricating Ltd., 550 F.3d 1356, 1360 (Fed. Cir. 2008).

293. *See supra* Part I.

294. Uniloc USA, Inc. v. Microsoft Corp., 632 F.3d 1292, 1311 (Fed. Cir. 2011).

ly, as the court did in *Uniloc* in rejecting this testimony as implausible.[295]

As recently as last year, the Federal Circuit emphasized the importance of *Daubert* in assessing patent damages. In *Cyntec Company, Ltd. v. Chilisin Electronics Corp.*,[296] the Federal Circuit vacated and remanded a damages award on grounds that the district court abused its discretion in denying appellant Chilisin's *Daubert* motion.[297] In this case, the court found that the expert's estimates of Chilisin's indirect sales to the United States were unreliable, given that he relied on "sales of irrelevant products and services" that did not contain the accused invention to make his projections.[298] It therefore vacated the damages award, holding that this expert testimony was "unreliable and speculative" and should not have been admitted by the district court.[299]

Yet *Daubert* is not always applied so rigorously, and some courts — including the Federal Circuit — have taken a lax approach in their application of *Daubert* to issues of patent damages. The Federal Circuit's recent decision in *EcoFactor*, described above, provides a vivid example. The panel majority expressed concern about the "standard for admissibility [for experts' damages opinions being] raised too high" and suggested that methodological flaws could be addressed on cross-examination.[300] Although the dissent stressed the need for judges to "pay close attention to the reliability of the methodology underlying expert testimony to ensure that the jury can fulfill its proper role as the factfinder,"[301] the majority's opinion evidences a larger problem. Many courts have permitted unreliable damages theories where the expert has claimed to perform apportionment but, in reality, has failed to do so. Until and unless this is rectified, *Daubert* will not be able to serve its intended purpose of preventing misleading and unreliable testimony.

The erosion of *Daubert* seems to have been especially common where experts purported to use two particular statistical techniques — regression and conjoint survey analysis. As discussed below, both are commonly used and potentially valuable tools. But both can be misused in ways that, whether intended or not, produce grossly inaccurate

295. See *id.*
296. 84 F.4th 979 (Fed. Cir. 2023).
297. *Id.* at 987.
298. *Id.* at 987–90.
299. *Id.* at 990.
300. 104 F.4th at 253, 257 ("If the standard for admissibility is raised too high, then the trial judge no longer acts as a gatekeeper but assumes the role of the jury.").
301. *Id.* at 262; *see id.* ("The majority's decision to overlook the prejudicial impact of his unreliable testimony abdicates its responsibility as a gatekeeper and contradicts our precedent.").

results. And courts have repeatedly in recent years permitted parties to introduce deeply flawed regression and conjoint survey analyses and have left it to the jury to decide their probative value. This has undermined both *Daubert* and the apportionment requirement by allowing patentees to seek damages that far exceed the value of the patent-at-issue. It has also encouraged litigation that has nothing to do with the promotion of innovation.[302]

a. Courts Have Not Consistently Applied Daubert *to "Regression" Analyses*

Regression is a statistical technique that attempts to estimate correlations between two or more variables in a data set.[303] Regression analysis involves identifying one variable (the dependent variable) that one wants to understand or predict, and other variables (the independent variable(s)) that might have an impact on the dependent variable.[304] Regression analysis uses a statistical analysis to try to sort out which independent variables have an impact on the dependent variable and the magnitude of that impact.[305]

For example, most employers have records describing their employees' salaries, as well as records that describe employees' ages, education levels, performance, years of experience, and so forth. Using that data, a regression analysis could be performed to try to estimate how an employee's age affects his or her salary — how much more (or less) an employer pays its older employees than its younger ones — after controlling for other factors (e.g., education levels, years of experience, performance) that may also affect salaries.[306]

Regression can sometimes provide instructive results if, among other things, the underlying data is accurate and complete, the variables included in the analysis are carefully considered and selected, all the relevant variables are included,[307] and the results make economic sense. Indeed, the authors have seen litigants argue that regression is a well-accepted technique and is used by the Department of Treasury and other government agencies. But a regression is only as useful as the inputs to the analysis and the structure of equation that the expert creates. Absent careful controls, or if used in the wrong context, re-

302. We note that *Daubert* applies not just to plaintiffs' experts but also to defendants'. *See* Adasa Inc. v. Avery Dennison Corp., 55 F.4th 900, 915 (Fed. Cir. 2022) (affirming exclusion of defendant's expert testimony for relying on non-comparable licenses).

303. Daniel L. Rubinfeld, *Reference Guide on Multiple Regression*, *in* REFERENCE MANUAL SCI. EVID. 303, 305 (Fed. Jud. Ctr. ed., 3d ed. 2011).

304. *Id.*

305. *Id.*

306. *See id.*

307. *See* Rubinfeld, *supra* note 303, at 314–16.

gression analyses may yield false or misleading results and can be entirely unreliable.[308]

For instance, in the example above (a regression designed to determine the impact of age on salary), imagine the analysis omits education, years of experience, and performance as variables. Instead, the only variables considered are salary, age, and the employee's favorite number. The exclusion of relevant information — variables like performance and experience that likely impact salary — and the inclusion of a wholly irrelevant variable (favorite number) would significantly distort the results.[309] Economists and courts also have noted that regression analyses, like the methodology at issue in *Daubert* itself,[310] show *correlation* between variables but not *causation* between them.[311] In other words, a regression may show that salary rises with an employee's favorite number, but that does not mean favorite number causes a salary increase.

This makes regression a potentially dangerous tool in litigation: "[W]hen inappropriately used, regression analysis can confuse important issues while having little, if any, probative value."[312] It may be useful when properly applied, but it may also provide misleading results that appear to be sophisticated and statistically based but, in

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308. *Id.* at 308, 322.

309. *See id.* at 314–16.

310. Daubert v. Merrell Dow Pharms., Inc., 509 U.S. 579, 583–84 (1993).

311. *See, e.g.*, Morgan v. United Parcel Serv. of Am., Inc., 380 F.3d 459, 466 (8th Cir. 2004) ("[E]ven the best regression equation cannot directly show discrimination because it cannot prove causation. The most it can show is a correlation that can give rise to an inference of discrimination."). The Federal Judicial Center explained:

> A correlation between two variables does not imply that one event causes the second. Therefore, in making causal inferences, it is important to avoid *spurious correlation*. Spurious correlation arises when two variables are closely related but bear no causal relationship because they are both caused by a third, unexamined variable. For example, there might be a negative correlation between the age of certain skilled employees of a computer company and their salaries. One should not conclude from this correlation that the employer has necessarily discriminated against the employees on the basis of their age. A third, unexamined variable, such as the level of the employees' technological skills, could explain differences in productivity and, consequently, differences in salary. Or, consider a patent infringement case in which increased sales of an allegedly infringing product are associated with a lower price of the patented product. This correlation would be spurious if the two products have their own noncompetitive market niches and the lower price is the result of a decline in the production costs of the patented product.

Rubinfeld, *supra* note 303, at 309 (emphasis in original).

312. *Id.* at 308.

reality, are no more logical than arguing that shoe size should predict salary.[313]

The risk is heightened because, over the past decade, many patentees have turned to regression analyses to try to meet the apportionment requirement. As the Federal Circuit began enforcing apportionment law through *Lucent* and its progeny, creative patentees searched for alternatives. They retained economists to argue that regression could isolate the value of just the accused feature from all the other features of the accused products.[314] This, the experts argued, allowed apportionment without the need to directly consider different contributions to the value of the product. The experts used a regression to calculate the per-unit price increase allegedly attributable to the feature at issue and multiplied by the number of accused units.[315]

This is where *Daubert* should do its work. In the *Daubert* framework, before an analysis of this complexity is presented to the jury, it should be shown to be scientifically reliable. Regression is a technical analysis. It requires consideration of variables, products, and time frame. And it involves a statistical analysis to determine the causal relationship between the variables. As an example, a typical regression calculation looks something like this:

$$Y_i = \beta_0 + \beta_1 x_{1i} + \beta_2 x_{2i} + \ldots + \beta_k x_{ki} + u_i$$[316]

To be clear, the issue is not whether regression in general can be useful tool; instead, the question is whether the specific regression techniques upon which a damages claim is predicated are reliable — have they been tested, peer reviewed, published, or otherwise validated?

Outside of the patent context, many district courts have done the hard work that *Daubert* requires — analyzing the inputs and results of

313. *See id.* at 309; Burak Bali, *Confounding or the Relationship Between Shoe Size and Salary*, BURAK'S DATA BLOG (Dec. 6, 2016), https://gunhanb.github.io/blog/2016/12/06/confounding.html [https://perma.cc/KF3H-WGFC].

314. *E.g.*, Huawei Techs. Co. v. T-Mobile US, Inc., No. 16CV00057, 2017 WL 7052466, at *1 (E.D. Tex. Sept. 10, 2017); Oracle Am., Inc. v. Google Inc., No. C10-03561, 2012 WL 850705, at *11 (N.D. Cal. Mar. 13, 2012). *See generally* Jake M. Holdreith, Christine Yun Sauer & Ryan Schultz, *Using Regression Models to Isolate the Value of a Patented Feature*, INTELL. ASSET MGMT., May/June 2013, at 19, 19, https://www.iam-media.com/litigation/using-regression-models-isolate-value-patented-feature [https://perma.cc/4XJU-DD3B]. Members of Mr. Lee's firm represented a party in the *Huawei* case.

315. Holdreith et al., *supra* note 314, at 19, 22–24.

316. JAMES H. STOCK & MARK W. WATSON, INTRODUCTION TO ECONOMETRICS 204 (3d ed. 2011). The variable to be explained (such as price) is labeled as Yi, and is hypothesized to be a function of other independent variables (such as product features), which are labeled as x1i, x2i, etc. The regression analysis attempts to measure the impact of each independent variable by estimating values β1, β2, etc.

the regression before determining whether the analysis can be presented to the jury. For instance, in *ATA Airlines, Inc. v. Federal Express Corp.*,[317] the Seventh Circuit ruled that the district court erred in not excluding a regression analysis that led to counterfactual results. ATA sued FedEx for alleged breach of contract.[318] At trial, the jury found in ATA's favor and awarded nearly $66 million in damages, based entirely on a regression analysis by ATA's expert that purported to show the additional profit ATA would have made but for the breach.[319]

But the Seventh Circuit ruled that the regression analysis was unreliable. The court found that the regression model had, for example, predicted that the plaintiff's costs would fall as its revenue rose, even though that was inconsistent with the plaintiff's actual financial data.[320] Specifically, the real-world financial data showed that, without exception, when the plaintiff's revenues rose, its costs also rose, and when its revenues fell, its costs also fell.[321] But the expert's regression produced the opposite result.[322] The regression, in other words, was counterfactual. The court also found that the regression used insufficient data — i.e., a "tiny sample" with so few data points that "there can be no reasonable confidence in the jury's damages award."[323] The Seventh Circuit carefully evaluated the flaws in the expert's regression analysis and concluded that the opinion did not satisfy Rule 702 and should not have been presented to the jury.[324]

The court in *In re Wireless Telephone Services Antitrust Litigation*[325] similarly carefully examined the plaintiff's regression analysis. There, the plaintiffs sued the five largest wireless telephone carriers in the United States, alleging that "requiring customers to purchase an approved handset in order to subscribe to the defendant's wireless telephone services constitute[d] an unlawful tying arrangement in violation of Section 1 of the Sherman Act."[326] The plaintiffs' expert performed a regression analysis to try to show that defendant's "tying and locking of handsets inflated the average wholesale price of handsets between 1999 through 2003 relative to that of other, comparable consumer electronic goods."[327] But the regression was missing key

317. 665 F.3d 882 (7th Cir. 2011).
318. *Id.* at 883.
319. *Id.* at 889, 892.
320. *Id.* at 894.
321. *Id.*
322. *Id.*
323. *Id.* at 895–96.
324. *See id.* at 890–95.
325. 385 F. Supp. 2d 403, 427–28 (S.D.N.Y. 2005).
326. *Id.* at 405.
327. *Id.* at 427.

variables. For example, the expert did not include a variable that accounted for the shift from analog to digital data, or variables such as longer battery life, email, and smaller size that clearly increased prices.[328] In other words, the expert drew a conclusion about the reasons price increased without considering key reasons why the price might have increased. The court excluded the regression analysis, explaining that "[w]here an expert conducts a regression analysis and fails to incorporate major independent variables, such analysis may be excluded as irrelevant."[329] The failure to include even "obvious and significant alternative explanations render[ed] [plaintiff's experts'] analysis 'essentially worthless.'"[330]

By contrast, in the patent context, when regression analyses are used as a proxy for apportionment, district courts have often been less willing to do the work that *Daubert* requires. Courts in these cases have allowed regression analyses to go to the jury despite some of the same types of flaws identified in the above cases.

Wisconsin Alumni Research Foundation v. Apple, Inc.[331] is one such example. The Wisconsin Alumni Research Foundation ("WARF") accused Apple's iPhones of infringing a patent that WARF alleged increased processing speed.[332] WARF's expert used a regression analysis to try to calculate the price increase associated with an increase in processing speed in Apple's accused products.[333] WARF's damages expert used the results of that analysis to support a $400 million damages number for alleged infringement of a single patent.[334] The expert argued that, because the regression isolated the value of the accused feature that purportedly improved processor speed, no separate apportionment was required — the analysis was already allegedly limited to the value of the accused feature.[335] The expert did no additional analysis to separate out revenues attributable to the accused feature versus the hundreds of other features of the processor, or indeed other patents that might cover the feature at issue in the case.

Instead, the purported "apportionment" was simply the regression. If that sounds similar to "built-in apportionment," there is good

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328. *Id.* at 428.
329. *Id.* at 427.
330. *Id.* at 428.
331. 135 F. Supp. 3d 865 (W.D. Wis. 2015) [hereinafter *WARF*].
332. *Id.* at 865, 883.
333. *Id.* at 883–84.
334. Tech Transfer Central, *WARF's Big Infringement Win Over Apple Offers Lessons for Universities*, TECH. TRANSFER TACTICS (Jan. 2016), https://techtransfercentral.com/reprints/ttt/116-warfs-big-infringement-win-over-apple/ [https://perma.cc/V5Q4-ABEM]; *see also WARF*, 135 F. Supp. 3d at 883.
335. *WARF*, 135 F. Supp. 3d at 883–84.

reason — in both instances, experts are essentially asking the court simply to trust that outsized damages numbers that come out of a black box are "apportioned."

WARF's regression, however, produced irrational results. For example, it concluded that "a larger display decreases value, and that a heavier phone increases value."[336] This is precisely the same problem the court identified in *ATA Airlines*.[337] But unlike the Seventh Circuit, the Western District of Wisconsin allowed the regression to be presented to the jury notwithstanding the counterfactual results, stating that Apple could cross-examine WARF's expert at trial: "Apple may well question [the expert] about his approach and whether the analysis results in outliers with respect to other variables, but the court does not find that this serves as a basis for striking his testimony."[338] But cross-examination is always available and cannot, by itself, eliminate the *Daubert* gatekeeping function.[339] The requirements of *Daubert* exist for a reason: examination of untested methodologies never shown to be reliable is not the task of the jury, which has no expertise in scientific methods and may inappropriately defer to a persuasive-sounding expert, but instead the responsibility of the court.

The same was true in *KAIST IP US LLC v. Samsung Electronics Co.*,[340] where KAIST alleged that processors in certain Samsung devices infringed a patent related to fin field-effect transistor devices. KAIST alleged that the patent provided increased processor speed.[341] Its damages expert used a regression analysis to try to determine the value of a one percent increase in processor speed derived from Samsung's products.[342] He asserted that the regression showed that Samsung should pay at least $1.5 billion in damages for alleged infringement of a single patent.[343] Again, the expert argued that because a regression inherently isolates the value of a feature or benefit, this analysis addressed the apportionment requirement and no additional apportionment was necessary.[344] Samsung, however, argued that the analysis was "wildly inaccurate" and incomplete — it modeled only nine features out of hundreds and produced nonsensical results.[345] For example, when Samsung added just one additional independent variable — random access memory ("RAM") — to the

336. *Id.* at 884 (citation omitted).
337. *See* ATA Airlines, Inc. v. Fed. Express Corp., 665 F.3d 882, 894 (7th Cir. 2011).
338. *WARF*, 135 F. Supp. 3d at 884–85.
339. *See supra* notes 288–292 and accompanying text.
340. No. 16-CV-01314, 2018 WL 2688185 (E.D. Tex. June 5, 2018).
341. *Id.* at *1.
342. *Id.*
343. *Id.*
344. *See id.* at *2.
345. *See id.* at *1.

regression, the results changed dramatically, causing the damages number to fall by $500 million.[346] The fact that RAM was not included in the model, and significantly changed the results when it was included, demonstrated the same problem that was identified in *In re Wireless* — omitted variables rendered the results unreliable.[347]

Nevertheless, without any substantive discussion, the court found that these issues went only to the weight to be given to the plaintiff's expert's opinion, not to its admissibility, and it let the regression — flaws and all — go the jury.[348]

* * * * *

Courts addressing regression analyses in the patent damages context have been unusually lax in applying *Daubert* to apportionment testimony and have not performed the rigorous analysis required by *Daubert*. But given that apportionment is so important — and complicated — this is an area where courts should be *more* rigorous in applying *Daubert*, not less. Before jurors are burdened with yet another complicated set of issues, the court should be the gatekeeper. As the discussion above demonstrates, all too often this has not happened. And the result is contrary to both *Daubert* and apportionment principles. Patentees are permitted to present unvalidated theories and methodologies — without any true apportionment — to demand outsized damages. That is not what the Supreme Court contemplated when it established the apportionment requirement or the *Daubert* standard.

b. Courts Have Not Consistently Applied Daubert *to Conjoint Survey Analyses*

The district courts' application of *Daubert* and Rule 702 has been similarly uneven when dealing with conjoint survey analyses in patent

346. *Id.*

347. *Compare id.* at *2 (discussing how adding RAM as a factor from regression analysis decreased damages by $500 million), *with In re* Wireless Tel. Servs. Antitrust Litig., 385 F. Supp. 2d 403, 427–28 (S.D.N.Y. 2005) ("At no point, however, did [plaintiffs' expert] Economides introduce *any* independent variables into his analysis of the inflation of handset prices *vis a vis* the prices he predicted . . . . Economides's failure to test for these obvious and significant alternative explanations renders Economides's analysis 'essentially worthless.'" (quoting Tagatz v. Marquette Univ., 861 F.2d 1040, 1045 (7th Cir. 1988)) (emphasis in original)).

348. *See KAIST*, 2018 WL 2688185, at *2 ("Defendants' addition of RAM as a factor in the regression analysis, and the corresponding reduction in damages of $500 million, seems a compelling counter-position to Weinstein's position, but amounts to a disagreement between experts as to what variables should be considered. That goes to the weight to be given to the opinion rather than its admissibility.").

cases. Conjoint survey analysis is a methodology borrowed from the marketing world and has been used in patent cases to attempt to value a specific feature or characteristic using consumer surveys.[349] To perform a conjoint survey analysis, an expert typically designs a survey in which participants are presented with products (e.g., laptop computers) with different combinations of features (e.g., screen size, memory, processing speed, weight).[350] The participants are asked to pick which of the proposed products they like best.[351] The expert repeats this several times with different combinations of features to identify the trade-offs consumers are willing to make to attempt to determine how consumers value each of the features presented in the survey.[352]

Conjoint survey analysis has become increasingly popular among plaintiffs' damages experts in recent years, including where experts rely on these analyses to try to satisfy the apportionment requirement.[353] Because conjoint survey analysis is designed to isolate the value of specific features, damages experts have used it to try to calculate damages when the patented technology is allegedly incorporated into one component or feature of a multi-component product.[354] But like regression, conjoint survey analysis can be misused.

Conjoint survey analysis is a generally accepted method that has long been used in economic and market analyses.[355] Like regression, the reliability of any conjoint survey study depends on the details — the types of products studied, the specific features included, the specific questions asked of the participants, and the economic reasonableness of the results. To use another example, consider a conjoint survey analysis attempting to discern the value customers place on the radio of a car. One version of the study includes every feature of the

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349. J. Gregory Sidak & Jeremy O. Skog, *Using Conjoint Analysis to Apportion Patent Damages*, 25 FED. CIR. BAR J. 581, 591 (2016).

350. *See id.* at 593.

351. *Id.*

352. *See id.* at 594.

353. *See* Greg Allenby, Peter E. Rossi, Lisa Cameron, Jeremy Verlinda & Yikang Li, *Calculating Reasonable Royalty Damages Using Conjoint Analysis*, 45 AIPLA Q.J. 233, 234 n.1 (2017) (collecting cases); *see also* Bernard Chao & Sydney Donovan, *Does Conjoint Analysis Reliably Value Patents?*, 58 AM. BUS. L.J. 225, 226–27 (2021) (describing the use of conjoint survey analysis as an "emerging technique" in patent damages); Sidak & Skog, *supra* note 349, at 581 ("To support their calculations of reasonable-royalty damages in patent infringement cases, experts increasingly introduce survey evidence to provide real-world evidence of consumers' valuations of patented technology."); *see also* Apple Inc. v. Samsung Elecs. Co., 735 F.3d 1352, 1366–68 (Fed. Cir. 2013) (using conjoint survey analysis in context of request for injunctive relief to show causal nexus between defendant's infringing conduct and plaintiff's alleged harm); Apple Inc. v. Samsung Elecs. Co., Ltd., 809 F.3d 633, 644 (Fed. Cir. 2015) (same). Mr. Lee represented a party in the *Apple* cases.

354. *See supra* note 353.

355. *See* Sidak & Skog, *supra* note 349, at 586.

car in the customer survey, asks carefully constructed questions that do not bias the participants, and yields sensible results in which clearly valuable features are assigned value. But there are many ways such a study could be improperly constructed. For example, imagine another version of the analysis in which the only features customers are asked about are the radio, the sound of the horn, and the warranty. Such a study that ignores many relevant non-patented features could lead to results that imply a far greater (and inaccurate) value for the patented feature, such as the radio. Indeed, researchers have recently concluded that there can be "serious problems" with conjoint survey analyses.[356] The researchers argued that, "in patent lawsuits involving numerous features, conjoint analysis should not be used to place a dollar value on the infringing feature."[357]

This is another area in which creative patentees have exploited the recent weakening of apportionment principles. Just as they have done with regression, patentees have used conjoint survey analyses as a stand-in for apportionment. They have constructed conjoint survey studies, argued that further apportionment is not required, and asserted that the results show extraordinary damages — in the hundreds of millions or billions of dollars. As a result, this is another area in which a rigorous *Daubert* analysis is needed to prevent unreliable analyses from going to the jury. But courts in patent cases have not consistently used *Daubert* in this manner.

For example, in *TV Interactive Data Corporation v. Sony Corporation*,[358] TV Interactive accused Sony of patent infringement based on the "autoplay" feature in certain Sony products (e.g., Blu-ray players).[359] TV Interactive's expert used a conjoint survey analysis to estimate the market's willingness to pay for the patented technology.[360] But the survey omitted key features — such as brand, processing speed, and picture quality — that were important to customers.[361] In

356. Chao & Donovan, *supra* note 353, at 225 ("First, the results of our surveys yielded irrationally high numbers. Most survey features suffered from bizarrely high valuations. Second, we demonstrate how experts can manipulate the results by selecting among a number of different ostensibly reasonable statistical choices and picking the one that yields the most desirable outcome."); *see also* Suneal Bedi & David Reibstein, *Damaged Damages: Errors in Patent and False Advertising Litigation*, 73 ALA. L. REV. 385, 388 (2021) ("By focusing *only* on the value of the patented features, experts employing the [Choice-Based Conjoint] methodology ignore non-patented features, and hence inflate estimates of the patented feature." (emphasis in original)).

357. Chao & Donovan, *supra* note 353, at 259.

358. 929 F. Supp. 2d 1006 (N.D. Cal. 2013).

359. *Id.* at 1006, 1020.

360. *Id.* at 1020.

361. *See id.* at 1025–26. The tested features were: Ability to play video from computer; Adjustable picture settings; Camera memory slot; Video noise reduction; Surround sound; and Instant skip/replay.

addition, the results did not make sense: the results showed, for instance, that the tested features were valued at $133 when the price of an entire Blu-ray player could be as low as $150.[362] Notwithstanding that key features were excluded, and that the results did not make economic sense, the court declined to use *Daubert* as the Supreme Court intended. Specifically, the court concluded that the flaws in the conjoint analysis presented a "'battle of the experts' for the jury to decide."[363]

TV Interactive is hardly alone. For instance, in *Odyssey Wireless, Inc. v. Apple Inc.*,[364] the court similarly allowed a conjoint survey that omitted key features to go to the jury. There, plaintiff Odyssey alleged that Apple and others' mobile phones infringed a patent related to long-term evolution ("LTE") communications.[365] The patented invention purportedly increased LTE upload speeds, and Odyssey's expert used a conjoint survey to estimate consumers' willingness to pay for a phone's upload speed.[366] Based in part on the results of that survey, the expert concluded that Apple should pay more than $8 per phone for the upload speed attributable to the patent.[367] The defendants argued the survey was significantly flawed: it omitted key product features such as brand, it focused solely on "high-end" smartphones despite that Odyssey also accused lower-cost devices, and it was not limited to LTE upload speed (and did not even mention LTE at all).[368] The court dismissed each flaw, stating that "conjoint analysis is a generally accepted method for valuing the individual characteristics of a product" and that "challenges to the reliability, methodology, or design of a survey 'go to the weight of the survey rather than its admissibility.'"[369]

That is not to say that all patent courts have turned a blind eye to suspect conjoint survey analyses. For instance, in *Visteon Global Technologies, Inc. v. Garmin International, Inc.*,[370] Visteon accused Garmin of infringing three navigation-related patents. Visteon's expert used a conjoint survey to try to determine the value that consumers placed on allegedly infringing features of the products at issue — points of interest, preview, route adjustment, and language display.[371]

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362. *Id.*
363. *Id.* at 1026.
364. No. 15-CV-01735, 2016 WL 7644790, at *9 (S.D. Cal. Sept. 14, 2016).
365. *Id.* at *6.
366. *Id.* at *9.
367. *Id.*
368. *Id.* at *10.
369. *Id.* at *9–10 (quoting Clicks Billards, Inc. v. Sixshooters, Inc., 251 F.3d 1252, 1263 (9th Cir. 2001)).
370. No. 10-CV-10578, 2016 WL 5956325, at *1 (E.D. Mich. Oct. 14, 2016).
371. *Id.* at *2–3.

The survey, however, omitted dozens of the products' features.[372] The court excluded the analysis, finding that the expert's failure "to determine the value of the four patented features relative to the multitude of non-patented features in the accused devices" made the analysis unreliable.[373] And because it would be "impossible for a jury to determine" based on the survey results "the profit that could actually be attributed to Garmin's use of the patented features," Visteon failed to meet the apportionment requirement.[374]

* * * * *

Faced with flawed regression and conjoint survey analyses that are offered as a proxy for apportionment, some courts apply *Daubert* in a disciplined manner while others do not. This inconsistent application of *Daubert* has important consequences. It essentially ensures that some patentees will be permitted to claim and obtain outsized damages using flawed analyses that should never be allowed to go to the jury. Patentees will also search for venues where the courts are less likely to apply *Daubert* with rigor.[375] And defendants cannot have any real confidence that the particular court they are in will properly apply *Daubert*, and they might be induced by that uncertainty to settle damages claims by agreeing to pay excessive royalties in order to avoid an even worse litigation outcome.

IV. THE PROBLEMS IN APPORTIONMENT LAW ARE PART OF A BROADER FAILURE TO RIGOROUSLY ANALYZE PATENT DAMAGES

The problems identified above with respect to patent damages do not arise in a vacuum, but rather reflect a broader trend in which the courts, the academic community, and commentators have paid insufficient attention to, and have failed to engage in rigorous analysis of, patent damages issues. For example, with the exception of a handful of cases dealing with ancillary damages issues (e.g., design patent damages[376] or enhanced damages under 35 U.S.C. § 284[377]), the Su-

372. *See id.*; *see also id.* at *16.

373. *See id.* at *6, *17.

374. *Id.* at *17.

375. Daniel Klerman & Greg Reilly, *Forum Selling*, 89 S. CAL. L. REV. 241, 289 (2016) ("[J]udges . . . make their courts more attractive to plaintiffs through doctrines . . . that allow plaintiffs' lawyers to present expert testimony that would flunk the *Daubert* test."); *see generally* Jonas Anderson & Paul R. Gugliuzza, *Federal Judge Seeks Patent Cases*, 71 DUKE L.J. 419 (2021) (discussing forum shopping in patent law).

376. *See* Samsung Elecs. Co., Ltd. v. Apple Inc., 580 U.S. 53 (2016).

preme Court has not addressed core issues relating to the methodology for determining patent damages for decades. Indeed, after having addressed apportionment more than thirty-five times between 1853 and 1915,[378] the Supreme Court does not appear to have addressed that topic even once in over one hundred years.[379]

The lack of attention to damages issues also plagues the district courts and the Federal Circuit. Given the technical complexity of the patents and products at issue in patent litigation today, district courts and the Federal Circuit often devote much of their time and attention to the liability issues, with damages issues receiving less time and less disciplined analysis.[380] At and before trial, the district courts focus much of their attention on claim construction and issues of infringement and invalidity. Moreover, as discussed and shown above, district courts vary widely in their application of *Daubert* and Rule 702, and many courts appear to believe that damages issues are less technical and something that can be decided by a jury without the court performing any gatekeeping function.[381] Then, at trial, district courts often impose strict time limits — such as giving the parties only a one-week trial in which a jury must learn the technology of multiple patents, decide issues of infringement and validity across those patents, and, if necessary, decide complex damages issues.[382] Further, defend-

377. *See* Halo Elecs., Inc. v. Pulse Elecs., Inc., 579 U.S. 93 (2016). Members of Mr. Lee's firm represented a party in this case.

378. Eric E. Bensen, *Apportionment of Lost Profits in Contemporary Patent Damages Cases*, 10 VA. J.L. & TECH. 1, 3 (2005). The Supreme Court addressed apportionment, for example, in Livingston v. Woodworth, 56 U.S. 546 (1854); Seymour v. McCormick, 57 U.S. 480 (1854); Suffolk Cnty. v. Hayden, 70 U.S. 315 (1866); Mowry v. Whitney, 81 U.S. 620 (1872); Philp v. Nock, 84 U.S. 460 (1873); Littlefield v. Perry, 88 U.S. 205 (1875); Burdell v. Denig, 92 U.S. 716 (1876); Birdsall v. Coolidge, 93 U.S. 64 (1876); *In re* Cawood Pat., 94 U.S. 695 (1877); Blake v. Robertson, 94 U.S. 728 (1877); Elizabeth v. Pavement Co., 97 U.S. 126 (1878); Marsh v. Seymour, 97 U.S. 348 (1878); Root v. Ry. Co., 105 U.S. 189 (1882); Garretson v. Clark, 111 U.S. 120 (1884); Black v. Thorne, 111 U.S. 122 (1884); Dobson v. Hartford Carpet Co., 114 U.S. 439 (1885); Yale Lock Mfg. Co. v. Sargent, 117 U.S. 536 (1886); Tilghman v. Proctor, 125 U.S. 136 (1888); Hurlbut v. Schillinger, 130 U.S. 456 (1889); Rude v. Westcott, 130 U.S. 152 (1889); Sessions v. Romadka, 145 U.S. 29 (1892); Keystone Mfg. Co. v. Adams, 151 U.S. 139 (1894); Warren v. Keep, 155 U.S. 265 (1894); Coupe v. Royer, 155 U.S. 565 (1895); Westinghouse Elec. & Mfg. Co. v. Wagner Elec. and Mfg. Co., 225 U.S. 604 (1912); and Dowagiac Mfg. Co. v. Minn. Moline Plow Co., 235 U.S. 641 (1915).

379. The last Supreme Court case to have discussed the apportionment requirement in a patent damages cases appears to be *Dowagiac*, 235 U.S. at 646 ("But as the drills were sold in completed and operative form, the profits resulting from the several parts were necessarily commingled. It was essential, therefore, that they be separated or apportioned between what was covered by the patent and what was not covered by it . . . .").

380. *See* Durie & Lemley, *supra* note 34, at 634.

381. *See supra* Section III.B.2.

382. *E.g.*, Minutes for Pretrial Conference Held Before U.S. District Judge Rodney Gilstrap at 1–2, Chamberlain Grp. LLC v. Overhead Door Corp., No. 21-CV-00084 (E.D. Tex. Mar. 11, 2022) (D.I. 587) (case involving three asserted patents tried in five days, allocating eleven hours per side for the jury trial portion with thirty minutes for opening and forty

ants understandably worry that if they spend the time necessary to build a sophisticated damages case, the jury will take that as a sign that the patentee has a strong liability case. The result is that in the authors' experience, in many cases, damages issues receive no more than a few hours of time at trial, and sometimes none at all from defendants. This pattern repeats itself in rulings on post-trial motions, where damages issues often get less attention and less disciplined analysis.[383]

On appeal, the Federal Circuit itself understandably focuses upon the infringement and invalidity issues. When the Federal Circuit does reach the damages issues, in the authors' experience, the Court often must work from a less-than-complete record because of the trial time limitations that, as discussed above, limit how much damages evidence can be presented in the district court. And the problem is exacerbated in some cases where the trial court does not perform its gatekeeping function and therefore does not force the parties to develop and explain a robust, comprehensive set of damages evidence. This problem is particularly acute in cases where experts rely on complicated economic models that have never before been tested or validated. If the district court does not require the experts to rigorously explain and justify these models, the models will often effectively go unchallenged because there is insufficient time for the opposing party to explore the models and weaknesses at trial and to develop a trial record on which the Federal Circuit can grapple with the relevant issues. Paradoxically, the underdeveloped records that come to the Federal Circuit as a result of this approach often lead to less (rather than more) scrutiny of damages awards on appeal, particularly because the key decisions occur on pretrial evidentiary motions that are often particularly hard to win on appeal.

The consequences of this lack of attention to damages issues are substantial for product companies who have found themselves exposed to enormous damages claims, which today routinely exceed more than $1 billion for patents that undisputedly cover at most only a small number of features among the thousands of features incorporated into modern electronic and mechanical products.[384] The evidentiary problems stem from a failure or unwillingness of district courts to perform the gatekeeping function required by *Daubert* — as dis-

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minutes for closing); Motion Offense, LLC v. Dropbox, Inc., 21-CV-00758 (W.D. Tex. May 19, 2023) (case involving four asserted patents tried in five days). For instance, the average trial was just five days for patent jury trials to verdict in the United States District Courts for the Eastern District of Texas and the Western District of Texas between January 1, 2022 and July 1, 2023. Members of Mr. Lee's firm represented a party in the *Motion Offense* case.

383. Durie & Lemley, *supra* note 34, at 634.

384. *See supra* Part II.

cussed *supra*, Section III.B.2, for example, regarding evidence relating to regression and conjoint survey analyses. The substantive patent law issues stem from a collection of decisions — such as the "built-in apportionment" cases described *supra*, Section III.B.1 — that fail to recognize the complexity of products accused of infringement today and fail to apply the principle of apportionment on a rational and consistent basis.

Finally, all of these problems are exacerbated by the increased number of cases filed by NPEs and the increased number of cases funded by litigation funders and hedge funds. As discussed above, the litigation funders and NPEs have no risk of patent counterclaims since they neither manufacture nor sell any products. As a consequence, these plaintiffs can assert extraordinary damages claims with little or no risk.

V. RECOMMENDATIONS

The skewed framework of patent damages undermines the underlying balance of patent policy. As a result of "built-in apportionment" and the inconsistent application of *Daubert*, patentees have sought, and sometimes have obtained, billions of dollars in damages for patents that cover minor features of complex products and that have not been shown to have anywhere near that value outside the courtroom. In fact, on many occasions, these patents have never been used by the claimed inventors or their employers.[385] The consequences of the imbalance are exacerbated by the proliferation of plaintiffs with little or nothing to lose in litigation when hedge funds and litigation funders value patents as low-investment lottery tickets. Rather than encouraging innovation, the result is a tax on innovation. And it forces technology companies to operate in fear of being on the other side of these demands and being forced to pay excessive damages that capture far more than the value of the asserted patents.

To correct this trend and restore the patent damages balance, the authors propose three remedies. First, courts should eliminate the "built-in" exception to the apportionment rule. Second, courts should return to focusing on the smallest saleable unit as the starting point for apportionment. Third, courts should more reliably enforce *Daubert* when patentees offer unreliable apportionment methodologies.

385. *See* Allison et al., *supra* note 64, at 267–68 (documenting the large share of NPEs in patent litigation).

A. End the "Built-In Apportionment" Exception

The Federal Circuit should end the "built-in apportionment" exception to the apportionment requirement, in which the Federal Circuit and district courts have too often effectively abandoned their roles as gatekeepers and allowed plaintiffs to sidestep real apportionment simply by invoking a prior license. As the Federal Circuit has acknowledged: "Built-in apportionment effectively *assumes* that the negotiators of a comparable license settled on a royalty rate and royalty base combination embodying the value of the asserted patent."[386] That "assum[ption]" too often has no basis in fact,[387] and violates *Garretson*'s mandate that patentees "must in every case give *evidence* tending to separate" the value of patented and unpatented features.[388]

The Federal Circuit therefore should make clear that "built-in apportionment" — and the conclusory expert testimony on which the claim is often based — is not allowed. The idea expressed by the Federal Circuit in *Vectura* — that some licenses may be "sufficiently comparable" such that "further apportionment may not necessarily be required"[389] — should be rejected, because the circumstances of a prior license are never identical to the circumstances of the hypothetical negotiation at issue in litigation. There will always be differences to be accounted for, and neither patent holders nor courts nor juries should assume that the prior license rate reflects the value of the asserted patent in the specific accused product. As the Supreme Court held in *Garretson*, "[T]he patentee . . . must *in every case* give evidence tending to separate or apportion the defendant's profits and the patentee's damages between the patented feature and the unpatented features."[390]

Rather than allowing patentees to bypass apportionment simply by relying on prior licenses and the assertion that apportionment is "built in," courts should return to requiring patentees in all instances to apportion their damages claim.[391] For example, courts should be

386. Vectura Ltd. v. GlaxoSmithKline LLC, 981 F.3d 1030, 1041 (Fed. Cir. 2020) (emphasis added).

387. *See supra* Section III.B.1.c; Storm, *supra* note 18, at 207 ("The court's assumption is false. License negotiations are influenced by a variety of factors having nothing to do with the value of the asserted patent. This assumption is also dangerous because it allows patent owners to avoid apportioning value in future cases if they successfully forced past licensees to sign agreements that did not appropriately apportion value."); Storm, *supra* note 156, at 302 (2022) ("This assumption is false. License negotiations are not academic exercises where both parties are focused on achieving the correct outcome consistent with all legal constraints and representative of the value being conferred.").

388. Garretson v. Clark, 111 U.S. 120, 121 (1884) (emphasis added).

389. *Vectura*, 981 F.3d at 1040.

390. *Garretson*, 111 U.S. at 121 (emphasis added).

391. *See id.*

clear that there is no presumption that further apportionment is not required. The term "built-in apportionment" should be abandoned because it implies that there is some inherent apportionment in prior licenses and thus leads courts to fail to be rigorous in their analysis of apportionment.

None of this means that courts should not use prior licenses. Prior licenses can be a useful real-world check on the hypothetical negotiation *Georgia-Pacific* envisions.[392] But courts should pick up where the Federal Circuit left off in *Omega* and *Micron* — and resolve the disagreement laid bare by *EcoFactor* — by strengthening the requirements for a disciplined demonstration of comparability, economically and technologically, and make meaningful adjustments to substantively apportion to the incremental value of the patent where the patentee relies on prior licenses:

(1) Where the prior agreement covers dozens or hundreds of patents, the patentee must do the work to determine the value of patents beyond the asserted patent(s). For example, if the asserted patent is one of twenty patents covered by a prior license, the patentee must do the analysis showing the portion of the payment attributable to the other nineteen patents.

(2) Where the prior agreement covers more than patent rights, the patentee must separate out the value of those additional rights. Where a prior agreement involves technology transfer, trade secrets, or other intellectual property, the value of that unrelated intellectual property must be accounted for.

(3) Where the payment in the prior license was derived from the value of a multifeature end-use product, the patentee must do the work to separate out the value of all non-patented features. Rather than simply assuming that the parties to the prior agreement did the analysis — or assuming that the end products covered by the agreement are the same as the end products at issue in the litigation — the patentee should be required to do the apportionment to show the value of the non-patented features covered by the prior agreement.

(4) Where the license articulates both a dollar payment and a purported royalty percentage, courts should rely on what is actually being paid in the license (usually a lump-sum dollar figure), not on a nonbinding recitation of what that payment supposedly represents.

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392. *See* Durie & Lemley, *supra* note 34, at 642–43.

(5) Courts should account for the difference between the real world in which a patent may or may not be infringed and the hypothetical *Georgia-Pacific* world in which we assume validity and infringement by adjusting the properly apportioned license accordingly.[393] That is yet another way in which actual licenses don't reflect the hypothetical bargain patent law attempts to recreate.

(6) Patentees should not be permitted to introduce total accused revenues to support a built-in apportionment analysis without satisfying the "entire market value" rule. As *Uniloc* recognized, reliance on an accused product's entire market value to calculate damages unfairly "skew[s] the damages horizon."[394] There is no analytical reason why "built-in apportionment" changes this.[395]

Moreover, the Federal Circuit should reiterate, consistent with the Supreme Court's instruction in *Garretson*, that *courts* are responsible for ensuring that the patentee has provided apportionment evidence that is "reliable and tangible, and not conjectural or speculative."[396] Judicial review of the patentee's apportionment analysis, in other words, must be rigorous. As the Supreme Court made clear in *Kumho Tire Co. v. Carmichael*,[397] a trial judge's general "gatekeeping" obligation "applies not only to testimony based on 'scientific' knowledge, but also to testimony based on 'technical' and 'other specialized' knowledge" — such as patent damages methodologies,[398] which are beyond the ordinary experience of lay jurors.

To be sure, this will require patentees and courts to do additional work when relying on prior licenses for damages purposes. It may require detailed analyses of the products or patents covered by prior

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393. *Id.*

394. Uniloc USA, Inc. v. Microsoft Corp., 632 F.3d 1292, 1320 (Fed. Cir. 2011).

395. Contrary to the Federal Circuit's suggestion in *Vectura* that giving the jury total revenue information is "necessary" when the prior license involved a percentage royalty applied against total product revenues, Vectura Ltd. v. GlaxoSmithKline LLC, 981 F.3d 1030, 1044 (Fed. Cir. 2020), trial courts and litigants can undertake their damages analysis without presenting such highly prejudicial numbers to the jury. In cases where the "entire market value" rule exception does not apply, patentees should be allowed to testify only as to the damages figure that would *result* from applying the license to the applicable revenue base, rather than expressly introducing a large revenue number that will do nothing more than skew the jury's perception of the damages analysis. To be sure, an alert and mathematically adept juror could reverse engineer the total revenues using a royalty rate and resulting damages number. But this approach lowers the risk that total revenue numbers will, as the Federal Circuit recognized in *Uniloc*, "skew the damages horizon for the jury." 632 F.3d at 1320.

396. *Garretson*, 111 U.S. at 121 (1884).

397. 526 U.S. 137 (1999).

398. *See id.* at 141.

agreements. But that is precisely what apportionment and the plaintiff's burden of proof demands, and there is no economic or legal reason why patentees should be excused from doing that work. Patentees may still choose to rely on prior agreements to prove damages — if they can show that the number they derive from those agreements demonstrates the value of the patents at issue, rather than the value of other rights or technology.[399]

B. Return to Focusing on the "Smallest Saleable Unit" as the Starting Point for Apportionment

Ending "built-in apportionment" will encourage patentees to turn (or return) to other apportionment methodologies. Foremost among these should be starting with the "smallest saleable unit." The courts should encourage litigants to start the apportionment analysis with the smallest saleable unit and then apportion from there — rather than starting with the entire value of a product when there is no showing that the patented technology is responsible for creating all of that value. Doing so avoids the challenging problems of apportioning value to the extent possible. The alternative — working backward from a composite product to estimate the value of its component — makes little sense when the component itself already has a well-established market value.[400]

Apportioning by starting with the smallest saleable unit not only represents an economically rational approach to apportionment (because it is more likely to ensure that non-accused components are not included in the damages valuation), but is also now well-defined in Federal Circuit caselaw.[401] Starting with the smallest saleable unit and then apportioning from there "produce[s] a royalty base much more closely tied to the claimed invention than the entire market value of the accused products,"[402] narrows the damages analysis and simplifies the process of apportionment, and helps protect against arbitrariness or error in the jury's selection of a royalty base.[403]

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399. *See Garretson*, 111 U.S. at 121.

400. *Cf.* Nicolas Petit, The Smallest Salable Patent-Practicing Unit ("SSPPU"), General Purpose Technologies and the Coase Theorem (Feb. 18, 2016) (unpublished manuscript), https://papers.ssrn.com/sol3/papers.cfm?abstract_id=2734245 [https://perma.cc/B28S-SPDX] (arguing that the smallest saleable unit undercounts patent value because some users will value the unit more than others). With respect, we think Petit has the Coase Theorem exactly backwards. Different consumers often value goods differently. When those goods sell in an open market, however, the seller doesn't have a legal right to capture that consumer surplus. They are entitled to recover the price of the goods sold.

401. *See supra* Section III.A.

402. VirnetX, Inc. v. Cisco Systems, Inc., 767 F.3d 1308, 1327 (Fed. Cir. 2014).

403. *Id.*

It is important to note that using the smallest saleable unit does not mean that the apportionment analysis ends after the smallest saleable unit is identified or that apportionment is not required if the accused product is the smallest saleable unit. To the contrary, as *VirnetX* held, the smallest saleable unit doctrine turns apportionment into a two-step exercise: first, if possible, the smallest saleable unit is identified to immediately exclude other components that should not be part of the damages analysis; and second, the smallest saleable unit is apportioned to identify the value of just what is accused. Thus, a patentee who can no longer rely on "built-in apportionment" may choose the smallest saleable unit as the starting point for its apportionment analysis rather than prior license agreements, which often capture far more than what is accused and, therefore, are more likely to lead to exclusion.

C. Apply Daubert *as It Was Intended*

The courts should be required to apply *Daubert* as it was intended. There is no patent law exception to *Daubert*. Patentees should not be given a free pass to present flawed regression and conjoint survey analyses to the jury simply by labeling them "apportionment" theories. Instead, just as many courts have done outside the patent context, courts dealing with patent damages should conduct a full *Daubert* analysis before allowing damages calculations to go to the jury. This means, for example, that:

(1) The refrain that "this goes to weight, not admissibility" should not be used as a substitute for the *Daubert* analysis. Courts in every instance should adhere to the requirements of *Daubert* to ensure that flawed analyses — such as those producing counterfactual results — are not introduced to the jury.

(2) Courts should conduct evidentiary hearings when serious concerns are raised regarding the reliability of complex analyses such as regression and conjoint surveys. This can, for example, require live testimony from the challenged expert so that the court can investigate firsthand the potential deficiencies. And district courts should be required to clearly articulate the basis for their decisions to allow for meaningful appellate review.

(3) Courts ruling on *Daubert* motions should articulate standards by which to judge the reliability of particular theories that recur in patent litigation, such as conjoint survey analysis, and why the test passed or failed *Daubert*. Neutral third par-

> ties may also provide helpful factors to consider in evaluating the reliability of such evidence. Over time, this will allow courts to develop a body of precedent that other courts can use to make an informed decision.

Courts should be encouraged to use the recent changes to Rule 702 as a starting point. As of December 1, 2023, Rule 702 was amended to require that the proponent of the expert theory demonstrate that it is more likely than not that "the expert's opinion reflects a reliable application of the principles and methods to the facts of the case," instead of requiring that the "expert has reliably applied the principles and methods to the facts of the case."[404] The committee notes to the rule change explain that the purpose of this amendment was to "more clearly empower[] the court to pass judgment on the conclusion that the expert has drawn from the methodology."[405] This gives courts an opportunity to use the rule change as a vehicle to conduct full and proper *Daubert* analyses.

VI. CONCLUSION

It would be a "very grave error to instruct a jury 'that as to the measure of damages the same rule is to govern, whether the patent covers an entire machine or an improvement on a machine.'"[406] Unfortunately, too many courts today make that "very grave error," lured by the promise that a prior settlement — or an expert's new theory — can replace the hard work of figuring out what the patent is actually worth. Doing that work — making sure that patentees receive the value of their invention, but no more — is critical to the proper functioning of the patent system.

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404. *See* FED. R. EVID. 702; COMM. ON RULES PRAC. & PROC. JUD. CONF. U.S., REPORT TO THE STANDING COMM. ADVISORY COMM. ON EVID. RULES, at 6 (2022); Colleen Cochran, *The Process, Progression, and Potential Ramifications of the Rule 702 Amendment*, A.B.A. BUS. L. SECTION (Sept. 5, 2022), https://businesslawtoday.org/2022/09/rule-702-amendment-process-progression-potential-ramifications [https://perma.cc/9UJM-QPEZ].

405. *See* FED. R. EVID. 702; COMM. ON RULES PRAC. & PROC. JUD. CONF. U.S., REPORT TO THE STANDING COMM. ADVISORY COMM. ON EVID. RULES, at 6 (2022) ("Thus the amendment is consistent with *General Electric Co., v. Joiner*, 522 U.S. 136 (1997), in which the Court declared that a trial court must consider not only the expert's methodology but also the expert's conclusion; that is because the methodology must not only be reliable, it must be reliably applied.").

406. Seymour v. McCormick, 57 U.S. 480, 491 (1853).