DAMAGING ROYALTIES: AN OVERVIEW OF REASONABLE ROYALTY DAMAGES

Zelin Yang[†]

Patent litigation is big business. The allure of massive reasonable royalties has led to the establishment of companies whose sole mission is to litigate and win patent wars. The number of patent actions has increased at an overall compound annual growth rate of seven percent since 1991.[1] It is not hard to find the incentive for these trends: the median damages award in 2012 was $9.5 million, including three damages awards over $1 billion.[2] More troubling than the large award amounts is the fact that median damage awards for non-practicing entities ("NPEs"), which include patent aggregators, universities, and so-called "patent trolls," have significantly outpaced those for practicing entities.[3] This issue is particularly pronounced in the computer hardware and electronics, business and computer services, and software industries.[4]

Once infringement of a valid patent has been established, the court must determine remedies. Patent damages are compensatory in nature and can take the form of either lost profits or reasonable royalties.[5] A patentee may recover lost profit damages if it can show that but for the alleged infringement, it would have earned those additional profits.[6] If the patentee is unable to meet the stringent requirements for lost profit damages, it can

---

† J.D. Candidate, 2015, University of California, Berkeley, School of Law.

1. *See* CHRIS BARRY, RONAN ARAD, LANDAN ANSELL & EVAN CLARK, PRICEWATERHOUSECOOPERS, 2013 PATENT LITIGATION STUDY: BIG CASES MAKE HEADLINES, WHILE PATENT CASES PROLIFERATE 6 (2013) [hereinafter Patent Litigation Study].

2. *See id.* at 7–8.

3. *See id.* at 7. From 1995 to 2000 the median award for NPEs was $4.6 million, while it was $5.7 million for practicing entities. But from 2007 to 2012, the tables had turned with NPE median awards rising to $7.2 million and practicing entity median awards dropping to $3.8 million.

4. *See id.* at 16, chart 6.

5. *See* Lucent Techs., Inc. v. Gateway, Inc., 580 F.3d 1301, 1324 (Fed. Cir. 2009) (determining that the two alternative categories of compensatory damages for patent infringement were lost profits and a reasonable royalty the patentee would have received from "arms-length bargaining").

6. *See, e.g.*, King Instruments Corp. v. Perego, 65 F.3d 941, 952 (Fed. Cir. 1995).

pursue a reasonable royalty instead. The federal statute dictates that "[u]pon finding for the claimant the court shall award the claimant damages adequate to compensate for the infringement, but in no event *less than a reasonable royalty*."[7]

Reasonable royalties are the most common form of damages, accounting for eighty-one percent of the damages awards over the last six years.[8] This reflects the trend of NPEs filing patent actions, as NPEs are ineligible for lost profits damages.[9] Unfortunately, the standards for determining a reasonable royalty remain uncertain. Although the Federal Circuit has attempted to clarify reasonable royalty case law with a string of decisions in recent years,[10] district courts have interpreted these decisions in contrary and diverging ways.[11] This situation is further complicated when dealing with multi-component products where the patented invention only comprises a small part of the end product. For example, the Central Processing Unit ("CPU") of a smart phone or tablet computer could implicate hundreds of patents by itself. How should damages be calculated when the infringed patent is merely one out of hundreds or thousands of patents in the finalized product? Should the damages be based on the value of the whole product or just the smallest separable component that uses the infringed patent? If the smallest component still uses multiple patents, should the court attempt to further apportion the patent's contribution?

Commentators have debated various approaches for tackling the aforementioned problems. This Note provides a background to reasonable royalties and the current state of the law in this area, and argues that reasonable royalty calculations must reflect apportionment principles depending on the situation. Part I provides a brief background of reasonable royalties and discusses the historical framework of the twin subtopics within reasonable royalties: the Entire Market Value Rule and apportionment. Part II focuses on recent Federal Circuit decisions that attempt to clarify this area of law and the divergent interpretation and application found in various

---

7. 35 U.S.C § 284 (2012) (emphasis added).

8. *See* Patent Litigation Study, *supra* note 1, at 11.

9. *See id.* at 11 (finding that if NPE results were omitted, the proportion of damages awarded through reasonable royalties decreases about six percent).

10. *See, e.g.*, LaserDynamics, Inc. v. Quanta Computer, Inc., 694 F.3d 51 (Fed. Cir. 2012); Uniloc USA, Inc. v. Microsoft Corp., 632 F.3d 1292 (Fed. Cir. 2011); *Lucent*, 580 F.3d 1301; *infra* Section II.A.

11. *See, e.g.*, Dynetix Design Solutions, Inc. v. Synopsys, Inc., No. 11–05973, 2013 WL 4538210 (N.D. Cal. Aug. 22, 2013); Summit 6 LLC v. Research in Motion Corp., No. 3:11-cv-367, (N.D. Tex. June 26, 2013); Internet Machs. LLC v. Alienware Corp., No. 6:10-cv-23, 2013 WL 4056282 (E.D. Tex. June 19, 2013).

district courts. Part II also introduces two methods that parties to litigation have recently proposed to determine a reasonable royalty: the Nash Bargaining Solution ("NBS") and conjoint analysis. Part III analyzes how these recent cases and tools affect the reasonable royalty calculation, while Part IV proposes a general framework to distinguish among different classes of cases.

I.   BACKGROUND

A.   PATENT DAMAGES: THE DISTINCTION BETWEEN LOST PROFITS AND REASONABLE ROYALTIES

The relevant federal statute on patent damages states that the patentee will be awarded "damages adequate to compensate for the infringement, but in no event less than a reasonable royalty."[12] This statute effectively provides two types of patent damages for patentees: lost profits and reasonable royalties.[13] Lost profits are available for patentees who can prove they would have made the sales had the infringer not violated their patent rights while reasonable royalties provide a minimum level of compensation for patentees who cannot meet the bar for lost profits.[14] A third category of damages, established royalties, exists when the market has objectively priced the patent.[15] But established royalties are difficult to prove and are rarely used.[16] Instead, this Section will detail the differences between lost profits and reasonable royalty damages, and explain the circumstances when one type of damages is appropriate over the other.

1.   Lost Profits

A patent allows its owner to exclude competitors from the market place. Lost profits give the patentee the monetary compensation it would have had if the infringer had never infringed, essentially fulfilling the purpose of the

---

12.   35 U.S.C § 284.

13.   *See* Mark A. Lemley, *Distinguishing Lost Profits From Reasonable Royalties*, 51 WM. & MARY L. REV. 655 (2009).

14.   *See, e.g.*, Panduit Corp. v. Stahlin Bros. Fibre Works, Inc., 575 F.2d 1152, 1157 (6th Cir. 1978) (finding that a patent owner is entitled to a reasonable royalty when lost profits cannot be proved).

15.   *See* Michael J. Chapman, *Averting A Collision Over Patent Settlement Licenses*, LAW360 (Apr. 5, 2012, 1:31 PM), http://www.analysisgroup.com/uploadedFiles/Publishing/Articles /Averting_Collision_Over_Patent_Settlement_Licenses.pdf; *see also* Rude v. Westcott, 130 U.S. 152, 165 (1889) (providing than an established royalty must (1) be paid before the alleged infringement, (2) be paid by a sufficient number of parties such that the royalty can be accepted as reasonable, and (3) be uniform).

16.   *See* Chapman, *supra* note 15.

patent.[17] Patentees who pursue lost profit damages must successfully prove they would have been able to exploit the monopolistic power conferred by the patent under the standard set by the Federal Circuit in *Panduit*.[18] In *Panduit*, the court provided a four factor test to determine whether lost profit damages were appropriate. The patentee must demonstrate: (1) demand for the patented product, (2) absence of acceptable non-infringing substitutes, (3) manufacturing capability to exploit the demand, and (4) the amount of profit the patentee would have made.[19]

However, lost profits only comprised thirty-three percent of damages awarded from 2007 to 2012 and only twenty-six percent from 2001 to 2006.[20] This is partly explained by the fact that non-practicing entities generally do not qualify for lost profit damages because they have no manufacturing capability and are not in direct competition with the infringer. Furthermore, many competitors are also unable to attain lost profit damages because of the difficulty of satisfying the *Panduit* factors, in addition to proving the lack of any mitigating factors.[21] For example, courts have refused to award lost profits when the patentee could not present sufficient evidence to separate profits from costs.[22] Courts have also lessened lost profit damages by considering non-infringing alternatives and the likelihood of divided profits.[23]

2. *Reasonable Royalties*

If the patentee cannot receive lost profits, reasonable royalties are available.[24] Unlike lost profits, which seek to award patentees the entire monopoly value of their patents,[25] reasonable royalties are meant to provide the patentee with a market-dictated rate.[26] Because patentees in the reasonable royalty context are deemed unable to capitalize on the exclusive nature of their patents, they would be overcompensated if the courts were to award them profits they would not have captured without the infringement.[27] Instead, the infringer would have paid the patentee a licensing fee to use the

---

17. Lemley, *supra* note 13, at 657.
18. *Id.*
19. *Panduit*, 575 F.2d at 1156.
20. Patent Litigation Study, *supra* note 1, at 11.
21. Michael A. Greene, *All Your Base Are Belong to Us: Towards an Appropriate Usage and Definition of the "Entire Market Value" Rule in Reasonable Royalties Calculations*, 53 B.C. L. REV. 233, 238–39 (2012).
22. *Panduit*, 575 F.2d at 1157.
23. Greene, *supra* note 21, at 238–39.
24. *Panduit*, 575 F.2d at 1157.
25. Greene, *supra* note 21, at 238.
26. Lemley, *supra* note 13, at 661.
27. *See* Greene, *supra* note 21, at 239–41.

patent-at-issue, while retaining a portion of the profit for itself.[28] This division of profits through a royalty is the patentee's rightful position, absent infringement.

Although the prototype of a reasonable royalty received Supreme Court approval in 1866,[29] some uncertainty remained as to whether reasonable royalties were a proper form of patent damages.[30] Then in 1915, the Supreme Court firmly stated that if an established royalty were not available, the patentee could offer evidence of the patent's value by considering what a reasonable royalty would have been.[31] Reasonable royalties were subsequently added to the patent statute in 1922,[32] with the current language added to the Patent Act in 1952.[33]

The most common framework for determining a reasonable royalty was set forth in the seminal case of *Georgia-Pacific Corp. v. United States Plywood Corp.*[34] In that case, the court enumerated fifteen factors that it held relevant in determining the reasonable royalty award for the infringer's actions.[35] These factors are now ubiquitously known as the *Georgia-Pacific* factors, and some have deemed them the "gold standard" of reasonable royalty calculations.[36] Also of note, *Georgia-Pacific* advocated the use of the

---

28. *See* Lemley, *supra* note 13, at 661.

29. *See* Suffolk Co. v. Hayden, 70 U.S. 315 (1865) (allowing the patentee to present "general evidence" of the value of the patent-at-issue to allow the jury to approximate a royalty when there was no established patent or license fee).

30. *See* Eric E. Bensen & Danielle M. White, *Using Apportionment to Rein in the Georgia-Pacific Factors*, 9 COLUM. SCI. & TECH. L. REV. 1, 25–26 (2008).

31. Dowagiac Mfg. Co. v. Minn. Moline Plow Co., 235 U.S. 641, 648 (1915) (holding that "it was permissible to show the value by proving what would have been a reasonable royalty" where there was no way of proving lost sales or an established royalty).

32. *See* Bensen & White, *supra* note 30, at 26–27 (explaining that the statute allowed damages of "a reasonable sum as profits or general damages for infringement").

33. 35 U.S.C § 284 (2012).

34. 318 F. Supp. 1116 (S.D.N.Y. 1970).

35. *See id.* at 1120. The fifteen factors are: (1) royalties the patentee receives for licensing the patent in suit, (2) rates the licensee pays for other comparable patents, (3) the exclusivity and restriction terms, (4) the Licensor's policy to maintain patent monopoly by not licensing the invention to others, (5) the commercial relationship between the two parties, (6) effect of selling the patented specialty in promoting sales of other products, (7) duration of patent and term of license, (8) established profitability of the products made under the patent, (9) advantages of the patented component over old components, (10) the nature of the patented invention, (11) the extent to which the infringer has used the invention, (12) the portion of profit customarily allowed for use of the invention, (13) the portion of profit attributable to the invention, (14) expert testimony, and (15) outcome from hypothetical arm's length negotiation at the time of infringement.

36. *See* Daralyn J. Durie & Mark A. Lemley, *A Structured Approach to Calculating Reasonable Royalties*, 14 LEWIS & CLARK L. REV. 627, 628 (2010).

"hypothetical negotiations" framework to approximate a reasonable royalty.[37] This framework asks how much a person would be willing to pay to use the patent-at-issue through a hypothetical negotiation between the patentee and infringer at the time of infringement, presuming both parties know everything the other side knows.[38] Additionally, the patent is presumed to be both infringed and valid.[39] Implicit in this exercise is the fact that the licensee must still be able to make a reasonable profit from use of the patent.[40]

One of the most pressing concerns facing patent litigation that a reasonable royalties calculation seeks to address is royalty stacking.[41] Royalty stacking refers to a situation where a single multi-component product infringes on multiple patents and is subsequently burdened with multiple royalties.[42] This becomes a very serious problem if each royalty is overcharged. At first glance, a patentee being compensated $0.11 per unit when the appropriate royalty should have been $0.10 per unit does not appear catastrophic. But in the consumer electronic and telecommunication industries, a single product may read on thousands of patents. The cumulative effect of potentially overcompensating thousands of patentees represents a crushing cost for producers and stifles innovation.[43] In fact, the aggregate costs of the royalties may exceed the value of the product, potentially pushing the infringer out of the market entirely.[44]

B.   STANDARD FOR EVIDENCE

In any discussion of reasonable royalties, it is important to remember that all analyses and models are subject to standards of evidence. Expert testimony is factor fourteen of the *Georgia-Pacific* factors[45] and some of the

---

37. *See Georgia-Pacific*, 318 F. Supp. at 1121.

38. *See id.*

39. *See* Lemley, *supra* note 13, at 669.

40. *See Georgia-Pacific*, 318 F. Supp. at 1122 (stating that the rule "contemplate[s] a marshaling of all of the pertinent facts which, like cards dealt face up, are for all to see"); William Choi & Roy Weinstein, *An Analytical Solution to Reasonable Royalty Rate Calculations*, 41 IDEA 49, 63 (2001) ("A reasonable royalty assumes that, after payment, the infringer will be left with a profit.").

41. *See* Mark A. Lemley & Carl Shapiro, *Patent Holdup and Royalty Stacking*, 85 TEX. L. REV. 1991, 1992 (2007); Brian J. Love, *Patentee Overcompensation and the Entire Market Value Rule*, 60 STAN. L. REV. 263, 280–81 (2007).

42. *See* Lemley & Shapiro, *supra* note 41, at 1993.

43. *See id.* at 2013.

44. *See* Golight, Inc. v. Wal-Mart Stores Inc., 355 F.3d 1327, 1338 (Fed. Cir. 2004) (internal quotation marks omitted) (finding that "there is no rule that a royalty be no higher than the infringer's net profit margin" and affirming a reasonable royalty of $31.80 per unit, despite the infringer forecasting a profit of $8 per unit).

45. *Georgia-Pacific*, 318 F. Supp. at 1120.

fiercest litigation in patent infringement cases revolves around the admission of expert testimony for calculating damages.[46] In order for expert testimony to be admitted, it must meet the standard set by the Supreme Court in *Daubert v. Merell Dow Pharmaceuticals, Inc.*[47] Likewise, any royalty calculation method will stand if it is sufficiently supported by the facts of the case. For example, in *Energy Transportation Group, Inc. v. William Demant Holding A/S*, the Federal Circuit upheld use of the twenty-five-percent rule, which was famously prohibited as a rule of thumb in *Uniloc*,[48] when it was only a factor in determining the final award and its usage was supported by evidence.[49]

In *Daubert*, the Supreme Court gave the district courts the responsibility to act as "gatekeepers" in assessing the reliability of expert testimony.[50] Under this mandate, trial judges are tasked with ensuring that expert testimony is both relevant to the case and is supported by a "reliable foundation."[51] The Court provided a non-definitive list of factors it deemed relevant in determining whether an expert's methodology is "scientifically valid."[52] These factors included whether the theory could be empirically tested,[53] whether the theory has been subject to peer review or publication,[54] the known or potential error rate,[55] the "existence and maintenance of standards controlling the technique's operation,"[56] and "general acceptance" of the theory.[57]

---

46. *See, e.g.*, Oracle Am., Inc. v. Google, Inc., 798 F. Supp. 2d 1111 (N.D. Cal. 2011); Suffolk Techs. LLC v. AOL Inc., No. 1:12cv625 (E.D. Va. Apr. 12, 2013); Mformation Techs., Inc. v. Research in Motion Ltd., No. 08–04990, 2012 WL 1142537 (N.D. Cal. Mar. 29, 2012).

47. *See* Daubert v. Merell Dow Pharms., Inc., 509 U.S. 579 (1993).

48. Uniloc USA, Inc. v. Microsoft Corp., 632 F.3d 1292, 1315 (Fed. Cir. 2011).

49. Energy Transp. Grp., Inc. v. William Demant Holding A/S, 697 F.3d 1342, 1356 (Fed. Cir. 2012).

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

51. *Id.* at 579, 584–87.

52. *Id.* at 592–93.

53. *Id.* at 593 ("Ordinarily, a key question to be answered in determining whether a theory or technique is scientific knowledge that will assist the trier of fact will be whether it can (and has been) tested.").

54. *Id.* (reasoning that "submission to the scrutiny of the scientific community is a component of good science, in part because it increases the likelihood that substantive flaws in methodology will be detected").

55. *Id.* at 594.

56. *Id.*

57. *Id.* (reasoning that "widespread acceptance" can be a factor in favor of admissibility while a technique with only "minimal support within the community" may be viewed skeptically).

In the context of patent damages, *Daubert* challenges typically center on an expert's qualifications and the quality of an expert's analysis.[58] A court may look to an expert's education and experience to determine whether he or she is properly qualified, while the reliability of an expert's analysis is evaluated by determining whether it properly applies the accepted methodology.[59] Common issues with the reliability of expert testimony include misuse of the *Georgia-Pacific* factors and adoption of an incorrect hypothetical negotiation date.[60] Testimony that fails the *Daubert* standard is excluded as inadmissible.

C.   THE ENTIRE MARKET VALUE RULE AND APPORTIONMENT

Because reasonable royalties theoretically split the profit between the infringer and patentee, damages based on such a royalty should be less than lost profit awards. This distinction makes sense when applied to NPEs and other entities that are only seeking a licensing fee from their patents. However, given the high standards required for lost profit awards, there will be competitors who can only resort to reasonable royalties and will be undercompensated. This has led to "doctrinal creep" such that courts improperly imported lost profit concepts into reasonable royalties analysis in an effort to increase reasonable royalty awards.[61] Chief among these is the Entire Market Value Rule ("EMVR").

1. Entire Market Value Rule

The EMVR permits a patentee to recover damages based on the market value of a product containing several features, but where the patent-at-issue only covers one of those features and that feature forms the basis for customer demand.[62] This restores the patentee to its rightful position because absent infringement, the patentee could have made its own multi-component product and captured those sales.[63] From this description, it is clear that the EVMR was originally designed for use in the lost profit context, as parties

---

58. *See* WILLIAM C. ROOKLIDGE, MARTHA K. GOODING, PHILIP S. JOHNSON & MALLUN S. YEN, COMPENSATORY DAMAGES ISSUES IN PATENT INFRINGEMENT CASES, 29–30 (2011).

59. *See id.* at 30.

60. *See id.*

61. *See* Lemley, *supra* note 13, at 662–64; Patricia Dyck, *Beyond Confusion—Survey Evidence of Consumer Demand and the Entire Market Value Rule*, 4 HASTINGS SCI. & TECH. L.J. 209, 214 (2012); Greene, *supra* note 21, at 245.

62. *See, e.g.*, Rite-Hite Corp. v. Kelley Co., Inc., 56 F.3d 1538, 1549 (Fed. Cir. 1995).

63. *See* Greene, *supra* note 21, at 241.

seeking reasonable royalties are presumed to be unable to fully capitalize on the demand for the patent.[64]

Rite-Hite Corp. v. Kelley Co., Inc. provided the contemporary version of the EMVR and expanded its use to reasonable royalty cases.[65] Some scholars have speculated that this expansion occurred due to the difficult evidentiary burden on a patentee in proving lost profits.[66] Courts, worried about undercompensating patentees who could not prove lost profits, added "kickers" to reasonable royalty awards, sometimes through the EMVR.[67] The EVMR increases the royalty base, thereby increasing the reasonable royalty. Mathematically, the choice of a larger or smaller base is of no consequence because it can be offset by a smaller or larger rate. Regardless of whether a one-percent rate is applied to $100 or a twenty-percent rate is applied to $5, the resulting royalty payment is $1. However, it is difficult for the trier of fact to arrive at a sufficiently low rate if the overall product is too far removed from the patent component.[68] For example, a patent relating to the lens of an LED is only a small component of the LED, which in turn is itself a component of an LCD screen, which might form a component of a computer or smart phone. If the value of the computer or smart phone forms the base, it would be very difficult for the trier of fact to determine a reasonable royalty rate.[69] The appropriate rate might be 0.0001 percent but the patentee could make the case that a 0.1 percent is reasonable because it is such a small number. However, a 0.1 percent royalty would be one thousand times more than what the correct rate is.

Use of the EMVR has been heavily criticized.[70] Some commentators have argued that a patent is *never* the sole driver behind a product's value.[71] These commentators note that contributions to the patent's value may stem from other patents or from the infringer's efforts in manufacturing and marketing the product.[72] Specific to reasonable royalties, the EMVR is inappropriate because patentees seeking reasonable royalty awards are unable to make the

---

64. *See* Lemley, *supra* note 13, at 660.

65. *Rite-Hite*, 56 F.3d at 1549.

66. *See, e.g.*, Lemley, *supra* note 13, at 662–663; Greene, *supra* note 21, at 245; Amy L. Landers, *Let the Games Begin: Incentives to Innovation in the New Economy of Intellectual Property Law*, 46 SANTA CLARA L. REV. 307, 361–62 (2006).

67. *See* Lemley, *supra* note 13, at 662–663.

68. *See* SUZANNE MICHEL ET AL., FTC, THE EVOLVING IP MARKETPLACE: ALIGNING PATENT NOTICE AND REMEDIES WITH COMPETITION 210–11 (2011).

69. *See id.*

70. *See, e.g.*, MICHEL ET AL., *supra* note 68, at 211 (recommending that courts eliminate the EMVP because it is irrelevant); Lemley, *supra* note 13, at 663.

71. *See* Lemley, *supra* note 13, at 663.

72. *Id.*

sale that captures the entire market value of the product.[73] Additionally, the EMVR of reasonable royalties is not the same EMVR of lost profits. Application of the EMVR merely expands the royalty base to the entire product in reasonable royalties analysis while a true application of the EMVR would award all profits from an infringing multi-component product to the patentee.[74] This would be the equivalent of a one-hundred-percent royalty base with a one-hundred-percent rate. However, the EMVR in reasonable royalties analysis allows the royalty base to be one hundred percent of total profits while the royalty rate is set at a some percentage less than one hundred percent.[75]

2. *Apportionment*

No discussion of the EMVR is complete without mentioning apportionment, a closely related concept. Apportionment seeks to limit a patentee's damages to the contributed value of the patent.[76] This principle is intuitive: if patentees were overcompensated relative to value of the contribution from their patent, the aggregate royalties from components would be greater than the value of the product itself. Under these circumstances, there is no economic incentive for a rational entity to use the patent. Apportionment can also address the modern concern of royalty stacking.[77] When damages are properly apportioned, aggregate costs are kept in check by the simple fact that the contributions of each patent cannot be found to exceed the value of the product.

Apportionment has roots in *Seymour v. McCormick*, a Supreme Court decision from 1853.[78] In that case, the Court rejected a jury instruction that would have allowed a patent for an improvement to recover the same damages as a patent for the entire device.[79] In 1884, the Court first recited the basic rule for apportionment in *Garretson v. Clark*, holding that the patentee must "separate or apportion the defendant's profits and the patentee's damages between the patented feature and the unpatented features."[80] Although there were many Supreme Court decisions addressing

---

73. *See id.*

74. *See* Greene, *supra* note 21, at 255–56.

75. *See id.* at 256 (proposing that such a rule be called the "entire market base rule" to differentiate it from the EMVR).

76. *See* Bensen & White, *supra* note 30, at 3.

77. *See* Damien Geradin & Anne Layne-Farrar, *Patent Value Apportionment Rules for Complex, Multi-Patent Products*, 27 SANTA CLARA COMPUTER & HIGH TECH. L.J. 763, 766 (2011).

78. Seymour v. McCormick, 57 U.S. 480 (1854).

79. *Id.* at 485–88.

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

apportionment in the late nineteenth and early twentieth centuries, very few modern cases broached the topic until recently.[81] However, with the advent of complicated multi-component products, apportionment has made a comeback.[82]

II.   RECENT CASE LAW AND NEW TECHNIQUES

Due to increasing lawsuits by NPEs and bigger patent damages awards, especially in the high-tech field,[83] several recent decisions have addressed the EMVR, apportionment, and reasonable royalties. Starting in 2009, the Federal Circuit released a string of opinions limiting the use of EMVR and reestablishing the apportionment requirement.[84] The courts have also addressed the use of new methodologies for calculating reasonable royalties, including the Nash bargaining solution and conjoint analysis.[85]

A.   RECENT CASE LAW

1.   *Cornell University v. Hewlett-Packard Co.*

Although *Cornell University v. Hewlett-Packard Co.* was not a Federal Circuit case, it was presided over by Chief Judge Rader of the Federal Circuit sitting by designation in the Northern District of New York, and it provided the foundation for a new discussion on apportionment. Cornell's patent claimed technology that issued multiple out-of-order computer processor instructions simultaneously, rather than sequentially.[86] This invention was not tied to the entire computing system; instead, the patent-at-issue read on one component of the instruction reorder buffer, which was only one component of a computer processor, which was one component of a CPU module, which was part of a brick, which was a part of a server.[87] Cornell's damages expert initially testified that reasonable royalties should be calculated using Hewlett-

---

81.   *See* Bensen & White, *supra* note 30, at 9, 21.

82.   *See infra* Section II.A.1.

83.   *See* Patent Litigation Study, *supra* note 1, at 7, 16.

84.   *See, e.g.*, LaserDynamics, Inc. v. Quanta Computer, Inc., 694 F.3d 51 (Fed. Cir. 2012); Uniloc USA, Inc. v. Microsoft Corp., 632 F.3d 1292 (Fed. Cir. 2011); Lucent Techs., Inc. v. Gateway, Inc., 580 F.3d 1301 (Fed. Cir. 2009).

85.   *See, e.g.*, TV Interactive Data Corp. v. Sony Corp., 929 F. Supp. 2d 1006 (N.D. Cal. 2013); Suffolk Techs. LLC v. AOL Inc., No. 1:12cv625, (E.D. Va. Apr. 12, 2013); Mformation Techs., Inc. v. Research in Motion Ltd., No. C 08–04990, 2012 WL 1142537 (N.D. Cal. Mar. 29, 2012); Oracle Am., Inc. v. Google, Inc., 798 F. Supp. 2d 1111 (N.D. Cal. 2011).

86.   Cornell Univ. v. Hewlett-Packard Co., 609 F. Supp. 2d 279, 283 (2009).

87.   *Id.*

Packard's earnings from its entire servers and workstations.[88] Because Cornell did not offer evidence to link consumer demand for servers to the patent, Chief Judge Rader excluded testimony that the entire market value of Hewlett-Packards servers should be the royalty base.[89] Cornell's expert subsequently reduced the royalty base from the servers to the next largest tier of products, the CPU bricks.[90] The jury agreed with the expert and awarded damages of $184 million.[91] Chief Judge Rader objected to the overly broad royalty base, stating that Cornell had "proceeded to attempt to show economic entitlement to damages based on technology beyond the scope of the claimed invention."[92] In a post-trial motion, Chief Judge Rader reduced the damages award to $53 million by using the "uncontroverted" royalty rate of 0.8 percent and applying it to the correct royalty base of $6.7 billion, the value of Hewlett-Packard's processors, rather than the $23 billion that formed the CPU brick revenue base.[93]

In addition to limiting use of the EMVR, *Cornell* is significant because it apportioned the royalty base to the "smallest salable infringing unit with close relation to the claimed invention."[94] By reaffirming the importance of apportionment in calculating reasonable royalty damages, Chief Judge Rader set the stage for the Federal Circuit's subsequent adoption of the "smallest salable infringing unit" requirement.

2. *Lucent Technologies, Inc. v. Gateway, Inc.*

Roughly concurrent with the *Cornell* case, in *Lucent Technologies, Inc. v. Gateway, Inc.*, Microsoft appealed a $357 million damages award for infringing the Day patent, which allowed users to select dates in a calendar without using a keyboard.[95] This case began when Lucent filed suit against Gateway, and Microsoft subsequently intervened.[96]

At trial, the jury found that the Microsoft Money, Windows Mobile, and Microsoft Outlook programs infringed the Day patent, and that Microsoft Outlook contributed the vast majority of the damages award.[97] The court speculated that the award was so high because the jury used an eight percent

---

88. *Id.* at 284.
89. *Id.*
90. *Id.*
91. *Id.*
92. *Id.* at 284–85.
93. *Id.* at 292.
94. *Id.* at 288.
95. Lucent Techs., Inc. v. Gateway, Inc., 580 F.3d 1301, 1308–09 (Fed. Cir. 2009).
96. *Id.* at 1308.
97. *Id.* at 1309, 1325.

royalty rate with the entire market value of the software.[98] The Federal Circuit held that Lucent had erroneously invoked the EMVR because there was no evidence that the Day patent formed even a substantial basis of the consumer demand for Outlook.[99] Indeed, Lucent's expert conceded that there was no evidence anyone had ever bought Outlook because it had a date picker.[100]

3. *Uniloc USA, Inc. v. Microsoft Corp.*

In another case involving Microsoft, *Uniloc USA, Inc. v. Microsoft Corp.*, the Federal Circuit addressed the EMVR and the twenty-five percent rule of thumb, a previously commonly used method for calculating the royalty rate.[101] Uniloc owned a patent for product registration software to reduce software piracy.[102] A jury found that Microsoft's Office and Windows programs used a similar and infringing Product Activation feature, and awarded Uniloc reasonable royalty damages of $388 million.[103] Uniloc's expert had testified that a Product Key was worth anywhere from $10 to $10,000.[104] Applying the twenty-five percent rule of thumb, which states that the patent owner receives twenty-five percent of the value of the product, to the lowest value ($10), he arrived at a baseline royalty rate of $2.50 per license issued.[105] Multiplying the baseline royalty rate by the 226 million Microsoft Office and Windows products sold, the expert arrived at a reasonable royalty of $564 million, which he claimed was reasonable because it represented *only* 2.9 percent of Microsoft's gross revenue of Office and Windows.[106]

The court made three important decisions in this case. First, the Federal Circuit rejected use of the twenty-five percent rule of thumb as a fundamentally flawed tool in determining a royalty rate because it was an abstract concept without any basis in the facts of the case.[107] Second, the court reiterated that the EMVR can only be used when the entire market value of the accused products is derived from the patented component.[108] The court determined that Uniloc's expert impermissibly introduced evidence of the entire market value of Microsoft's products because the

---

98. *Id.* at 1336.
99. *Id.* at 1337.
100. *Id.*
101. Uniloc USA, Inc. v. Microsoft Corp., 632 F.3d 1292, 1312–18 (Fed. Cir. 2011).
102. *Id.* at 1296.
103. *Id.* at 1296, 1311.
104. *Id.* at 1311.
105. *Id.*
106. *Id.* at 1311–12.
107. *Id.* at 1315, 1317.
108. *Id.* at 1320.

entire market value of Microsoft Office and Windows did not derive from Uniloc's patent. Third, the court dismissed Uniloc's arguments that the use of the $19 billion figure was only a check. Uniloc, relying on *Lucent*,[109] argued that it was allowed to use the EMVR of the products as long as the royalty rate was low enough. However, that quote merely expressed the mathematical truism that a larger base can be compensated with a smaller rate in arriving at a similar royalty calculation. As the *Uniloc* court noted, the Supreme Court and Federal Circuit precedents do not allow parties to invoke the EMVR simply when it is paired with a low enough royalty rate.[110]

Uniloc also illustrates the dangers of juror bias when the EMVR is misapplied. The Federal Circuit noted that "[t]he disclosure that a company has made $19 billion dollars in revenue from an infringing product cannot help but skew the damages horizon for the jury" and that the "[t]he $19 billion cat was never put back into the bag."[111] Furthermore, Uniloc derided Microsoft's lump-sum theory, which advocated $7 million in damages, by implying a relationship between the entire market value of the products and the patent, thus making Microsoft's $7 million figure look comical when compared to the $19 billion revenue.[112] The court characterized this as "a clear derogation of the entire market value rule" and recognized that "Uniloc's derision of Microsoft's damages expert . . . may have inappropriately contributed to the jury's rejection of his calculations."[113]

4. *LaserDynamics, Inc. v. Quanta Computer, Inc.*

More recently, in *LaserDynamics, Inc. v. Quanta Computer, Inc.*, the Federal Circuit adopted Chief Judge Rader's "smallest salable patent-practicing unit" formulation from *Cornell*.[114] In this case, the plaintiff LaserDynamics patented a method for identifying the type of optical disc inserted into an optical disc drive ("ODD").[115] LaserDynamics claimed Quanta actively induced infringement of its patent by incorporating infringing ODDs into the

---

109. *Lucent Techs., Inc. v. Gateway, Inc.*, 580 F.3d 1301, 1338–39 (Fed. Cir. 2009) (reasoning that "the base used in a running royalty calculation can always be the value of the entire commercial embodiment, as long as the magnitude of the rate is within an acceptable range").

110. *Uniloc*, 632 F.3d at 1320.

111. *Id.* at 1320.

112. *See id.* at 1320–21. The decision included a portion of the cross-examination of Microsoft's damages expert, during which Uniloc repeatedly points out that $7 million is only 0.00003 percent of $19 billion. *Id.* $7 million is actually 0.03 percent of $19 billion. Uniloc's attorney and Microsoft's expert both miscalculated.

113. *Id.* at 1321.

114. LaserDynamics, Inc. v. Quanta Computer, Inc., 694 F.3d 51, 67 (Fed. Cir. 2012).

115. *Id.* at 56–57.

computers it assembled and sold. LaserDynamics initially used the value of the computers as the royalty base. However, the court stated that "it is generally required that royalties be based not on the entire product, but instead on the 'smallest salable patent-practicing unit,'" in this case, the ODDs.[116] By denying LaserDynamics the opportunity to use the EMVR, the Federal Circuit clarified and raised the standard for the EMVR. It is not sufficient that the patented technology be "valuable, important, or even essential" to the product.[117] Instead, for the EMVR to apply, the patented technology must be what motivates consumers to purchase the product.[118]

The court also found that the patentee's expert's testimony in arriving at a royalty figure was overly arbitrary and unsupported by any sort of quantitative economic analysis.[119] Instead of "alleging a loose or vague comparability between different technologies or licenses," the court attached strong probative value to actual licenses of the patented technology in determining a reasonable royalty.[120]

5. *The District Court Interpretations*

The "smallest salable patent-practicing" language from *LaserDynamics* has led to various contradictory interpretations in the district courts.[121] Some courts have accepted the argument that *LaserDyamics* allows patentees to calculate a reasonable royalty based on all revenues derived from the smallest salable infringing unit without further apportionment. For example, the court in *Summit 6 LLC v. Research in Motion Corp.* ruled that "using the entire device as the royalty base [was] proper because the device itself [was] 'the smallest patent-practicing unit.'"[122] Similarly, the court in *Internet Machines LLC v. Alienware Corp.* found that additional apportionment was unwarranted and the EMVR did not apply where the expert used the smallest salable unit as the royalty base.[123]

However, other courts have ruled that the EMVR can still apply to the smallest salable patent practicing unit when that unit is made up of multiple

---

116. *Id.* at 67.
117. *Id.* at 68.
118. *Id.*
119. *Id.* at 69.
120. *Id.* at 79.
121. *See* Martha K. Gooding, *Reasonable Royalty Patent Damages and the "Smallest Salable Patent-Practicing Unit" Dicta*, 86 PAT., TRADEMARK & COPYRIGHT J. (BNA) 771 (Aug. 9, 2013).
122. Summit 6 LLC v. Research in Motion Corp., No. 3:11-cv-367, at *19–20 (N.D. Tex. June 26, 2013).
123. Internet Machs. LLC v. Alienware Corp., No. 6:10-cv-23, 2013 WL 4056282, at *24–25 (E.D. Tex. June 19, 2013).

components. In *Dynetix Design Solutions, Inc. v. Synopsis, Inc.*, the court correctly declared *LaserDynamics* supported the "premise that an apportionment is still required even where there the accused product is the smallest salable unit or where whatever the smallest salable unit is it is still a multi-component product encompassing non-patent related features."[124] This reading of *LaserDynamics* is the more logical of the two as it is the one that follows the principle behind the EMVR. There is no reason the patentee should receive reasonable royalties calculated on the entire market value of the smallest salable patent practicing unit without apportionment if the patented feature did not form the basis of consumer demand for the smaller base. The patentee could end up being compensated for components it did not invent, a result that extends the monopolistic power of the patent far beyond its scope. If apportionment only required limiting the royalty base to the smallest salable patent practicing unit, then the EMVR would be violated with respect to the smaller unit. Therefore, the interpretation of *LaserDyanmics* offered by the *Dynetix* court is correct: apportionment is still required even where the accused product is the smallest salable unit.

B.   NEW TOOLS IN REASONABLE ROYALTY CALCULATIONS

Some have criticized the *Georgia-Pacific* factors for being too malleable and subject to expert manipulation.[125] Similarly, courts have long complained that calculating a reasonable royalty "is a difficult judicial chore, seeming often to involve more the talents of a conjurer than those of a judge."[126] In recent years, parties have attempted to introduce new methods of calculating reasonable royalties that they claim are more rigorous, scientific, and grounded in economics.[127] Two of the most prominent are the Nash bargaining solution and conjoint analysis.

1. Nash Bargaining Solution

The Nash bargaining solution ("NBS") is meant to find an outcome that is most beneficial for both parties in a two party bargaining scenario, known as the Nash bargaining game.[128] In reasonable royalty calculations, the parties

---

124. Dynetix Design Solutions, Inc. v. Synopsys, Inc., No. C 11-05973 (N.D. Cal. Aug. 22, 2013).

125. *See, e.g.*, Thomas F. Cotter, *Four Principles for Calculating Reasonable Royalties in Patent Infringement Litigation*, 27 SANTA CLARA COMPUTER & HIGH TECH L.J. 725, 730 (2011).

126. Fromson v. Western Litho Plate & Supply Co., 853 F.2d 1568 (1988).

127. *See* Choi & Weinstein, *supra* note 40, at 49.

128. *See* S. Christian Platt & Bob Chen, *Recent Trends and Approaches in Calculating Patent Damages: Nash Bargaining Solution and Conjoint Surveys*, 86 PAT., TRADEMARK & COPYRIGHT J. (BNA) 909 (Aug., 30, 2013); Choi & Weinstein, *supra* note 40, at 56.

must be able to estimate: (1) each party's disagreement profits (the profit each party would receive if the negotiation fails) and (2) the total profits from licensing.[129] If both parties have equal bargaining power such that neither can profit without entering into a license agreement, then each party's disagreement profits are both zero and the solution is to split the profits evenly.[130]

While the NBS is attractive in theory, it has received a lukewarm reception in practice. Some patentees have attempted to use the NBS as a replacement for the twenty-five percent rule of thumb, while others have used it as a benchmark to check against a reasonable royalty determined through the *Georgia-Pacific* factors.[131] Whether a court allows expert testimony about the NBS is largely dependent on whether the expert is relying on NBS as an arbitrary rule of thumb or whether the facts of the case actually support application of the NBS. For example, Judge Alsup criticized use of the NBS in *Oracle America, Inc. v. Google Inc.* by comparing it to the twenty-five percent rule of thumb and stating that "the Nash bargaining solution would invite a miscarriage of justice by clothing a fifty-percent assumption in an impenetrable façade of mathematics."[132] Specifically, the court found that the expert did not provide any evidence to show how the NBS assumptions applied in this particular case.[133] Similarly, the court in *Suffolk Technologies LLC v. AOL Inc.* ruled that expert testimony on the NBS and the resulting evenly split profits were inadmissible because they did not appear "to be tied to the facts of [the] case."[134] However, the court in *Mformation Technologies v. Research in Motion* allowed the expert's testimony regarding the NBS over the infringer's objections that it was essentially a rule of thumb.[135] The court justified its decision by noting that the NBS was not being relied upon as a stand-alone calculation for reasonable royalties; rather it was merely used to check the reasonableness of a rate determined from the *Georgia-Pacific* factors.[136] From these cases and others, it appears that the courts will find

---

129. *See* Platt and Chen, *supra* note 128. See the Appendix for a detailed description of this derivation.

130. *See* Choi & Weinstein, *supra* note 40, at 56.

131. *See, e.g.*, Suffolk Techs. LLC v. AOL Inc., No. 1:12cv625, slip op. at 3–5 (E.D. Va. Apr. 12, 2013); Mformation Techs., Inc. v. Research in Motion Ltd., C 08–04990, 2012 WL 1142537 (N.D. Cal. Mar., 29, 2012); Oracle America, Inc. v. Google, Inc., 798 F. Supp. 2d 1111 (N.D. Cal. 2011).

132. *Oracle*, 798 F. Supp. 2d at 1120.

133. *Id.*

134. *Suffolk Techs*, No. 1:12cv625, slip op. at 4.

135. *Mformation Techs.*, 2012 WL 1142537, at *15–16.

136. *Id.*

expert testimony on the NBS admissible if the expert can tie the NBS to the facts of the case, rather than relying on it as a rule of thumb.

2. *Conjoint Analysis: Consumer Surveys*

Conjoint analysis is a marketing research tool that utilizes consumer surveys and statistical analysis to determine consumer preferences for certain features relative to other features in the same product.[137] Researchers in marketing and business have used conjoint analysis for over fifty years, and it is currently the most commonly used method of analyzing consumer trade-offs.[138] Likewise, consumer survey evidence is widely used in trademark law to show confusion.[139] Recently, conjoint analysis has made its way into patent cases.[140] Although the courts have shown no objection to the concept of using conjoint analysis and survey evidence, the admissibility of such evidence is dependent on how the study was conducted.

A conjoint survey typically identifies important features of a product, called attributes, and different variations within those attributes, called levels.[141] For example, toothpaste might have four attributes (brand, taste, fluoride level, and price) and each attribute may have three levels (three different brands, three different flavors, three different fluoride levels, and three different prices). Different combinations are packaged together and consumers are asked to rank the packages. Researchers then run a statistical analysis to determine how each level of each attribute contributes to the overall value of the product, which is called a "part-worth."[142] This data can then be used to determine the consumer's willingness to pay ("WTP") for the level of the attribute, and thus isolate a product feature's value.[143]

Although this analysis appears relatively simple and scientific, conjoint analysis is somewhat limited. Due to human limitations and combinatorial explosion, conjoint analysis is most useful when only a small set of features are evaluated.[144] Studies have shown consumers cannot make effective

---

137. *See* Dyck, *supra* note 61, at 225.

138. *See* Paul E. Green, Abba M. Krieger & Yoram Wind, *Thirty Years of Conjoint Analysis: Reflections and Prospects*, 31 INTERFACES 56, 56–57 (2001).

139. *See* Dyck, *supra* note 61, at 219–20.

140. *See* Oracle Am., Inc. v. Google, Inc., No. C 10–03561, 2012 WL 850705 (N.D. Cal. Mar. 13, 2012); TV Interactive Data Corp. v. Sony Corp., 929 F. Supp. 2d 1006 (N.D. Cal. 2013).

141. *See* Green, Krieger, & Wind, *supra* note 138, at 58.

142. *See* Lisa Cameron, Michael Cragg & Daniel McFadden, *The Role of Conjoint Surveys in Reasonable Royalty Cases*, LAW360 (Oct. 16, 2013, 6:37 PM), http://www.law360.com/articles/ 475390/the-role-of-conjoint-surveys-in-reasonable-royalty-cases.

143. *See, e.g.*, *id.*

144. *See* Dyck, *supra* note 61, at 226.

decisions when faced with more than seven attributes.[145] Additionally, in complex multi-component products such as computers or smartphones, there may be thousands of patents and thus, thousands of different features. The large number of attributes, each with multiple levels, leads to combinatorial explosion. Combinatorial explosion refers to the huge increase in possible combinations of attributes and features due to small increases of attributes and features.[146] Some combinations could be eliminated to present survey respondents with a manageable number of choices; however, manipulating which features to include can lead to that particular feature being preferred in the consumer surveys, simply because the other attractive attributes were not included in the survey.[147]

Whether a court admits survey evidence is largely dependent on the methodology used. For example, in *Oracle v. Google*, Judge Alsup rejected Oracle's consumer survey evidence because consumers found thirty-nine features relevant but only seven were included in the survey and no explanation was given for the exclusion of the other thirty-two features.[148] However, the court made clear that its issue was with Oracle's methodology and not consumer surveys in general, noting that "consumer surveys are not inherently unreliable."[149] In contrast, the court in *TV Interactive Data v. Sony* admitted conjoint analysis evidence because the patentee selected components that were similar to the patented components at issue and the analysis was properly founded in fact.[150]

III. ANALYSIS

After the string of decisions discussed in Section II.A, it is clear that the rules on apportionment and the EMVR have changed. The Federal Circuit has repeatedly and explicitly limited application of the EMVR to situations where the patent-in-suit drives consumer demand for the product. In light of this limitation on the use of the EMVR, it follows that apportionment now comes in two steps: apportionment of the royalty base and apportionment of the royalty rate.

---

145. *See, e.g.*, Cameron, Cragg & McFadden, *supra* note 142; Green, Krieger & Wind, *supra* note 138, at 8–9.

146. *See* Dyck, *supra* note 61, at 226.

147. *See id.*

148. Oracle America, Inc. v. Google, Inc., No. C 10–03561, 2012 WL 850705, at *15–16 (N.D. Cal. Mar. 13, 2012).

149. *Id.*

150. TV Interactive Data Corp. v. Sony Corp., 929 F. Supp. 2d 1006, 1019–20 (N.D. Cal. 2013).

A.   ROYALTY BASE

Under *Lucent*, it appeared that the court endorsed the proposition that a patentee could pick anything as the royalty base so long as the magnitude of the rate was appropriate.[151] This decision made sense mathematically, but *Uniloc* disclaimed that language due to evidentiary concerns.[152] After *LaserDynamics*, patentees must use the smallest salable patent-practicing unit as the royalty base.[153] This instruction is straightforward when the patent reads on a discrete component of the multi-component product, such as the microprocessor in *Cornell* or the ODDs in *LaserDynamics*. However, what should the royalty base be if the patent reads on a feature that cannot be isolated to a smaller unit within the product? In these cases, the royalty base might be calculated as the value the patent contributes to the product.[154] This can be defined in a variety of ways, including the value the patent holds over the next-best non-infringing alternative or the cost of a design-around.

Theoretically, the value of a patent is exactly equal to the difference in value the patent provides over the next-best alternative, as no rational actor would pay more than that for use of the invention.[155] Because this limits the patentee's maximum recovery to the contribution its patent made to the product, this analysis embodies apportionment by definition. Under this methodology, parties would be trying to prove the difference between the present value of the profit from using the patent-at-issue and the present value of the next-best alternative,[156] which is essentially the first step of the Nash bargaining solution. Alternatively, the value provided by the patent can be represented by the cost savings that the patent provides over the licensing of a different substitute technology or coming up with a design around.

One recent example of an attempt at using the cost of a design around can be found in *Apple Inc. v. Motorola, Inc.*[157] In that case, Motorola's expert

---

151.   Lucent Techs., Inc. v. Gateway, Inc., 580 F.3d 1301, 1338–39 (Fed. Cir. 2009).

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

153.   LaserDynamics, Inc. v. Quanta Computer, Inc., 694 F.3d 51 (Fed. Cir. 2012).

154.   *See* Christopher B. Seaman, *Reconsidering the* Georgia-Pacific *Standard for Reasonable Royalty Patent Damages*, 2010 BYU L. REV. 1661, 1711 (2010).

155.   *See* Cotter, *supra* note 125, at 743 (citing Grain Processing Corp. v. Am. Maize-Products Co. 893 F. Supp 1386, 1392–93 (N.D. Ind. 1995), *rev'd mem. on other grounds* 108 F.3d 1392 (Fed. Cir. 1997) (using cost savings in comparison with next-best alternative to estimate a reasonable royalty).

156.   *See* Roy J. Epstein & Alan J. Marcus, *Economic Analysis of the Reasonable Royalty: Simplification and Extension of the* Georgia-Pacific *Factors*, 85 J. PAT. & TRADEMARK OFF. SOC'Y 555 (2003) (proposing a mathematical model based on the difference in value between the patented technology and the next-best alternative for calculating reasonable royalties).

157.   Apple, Inc. v. Motorola, Inc., No. 11-cv-08540, 2012 WL 1959560 (N.D. Ill. May 22, 2012).

testified that a reasonable royalty for Apple's patent, a technology that allowed the toolbar to notify the user with basic information on the state of his device, would be $100,000.[158] Motorola's expert arrived at this number based on the fact that creating the patented feature had only cost $67,000 and because one of Motorola's technical experts was able to write a bit of code to bypass Apple's patent in a single afternoon.[159] Although the court excluded this testimony because it was improper to base the design around costs on testimony from a Motorola employee, this case illustrates the possibility of using the cost savings associated with developing a design-around as the base in reasonable royalty calculations. Although the design-around approach has only been successfully applied in the lost profits context thus far, "its logic is equally applicable in the reasonable royalty context" and the Federal Circuit has indicated it might extend this approach to reasonable royalties.[160]

However, in reality it may be difficult to determine the difference in present values between the use of the patent-at-issue and the next best non-infringing alternative. There may be problems acquiring accurate data or projections of profitability and cost. Additionally, under the hypothetical negotiation framework, the next best non-infringing alternative must be determined as of the date of infringement. This presents difficulties as the passage of time may skew counterfactual judgments and make one alternative seem trivial or obvious in retrospect. Despite these difficulties, the Federal Circuit has noted that "patent law encourages competitors to design or invent around existing patents"[161] and parties have not shied away from using design around costs as an element of their damages analysis.

B.   ROYALTY RATE

The dispute between the district courts' interpretations of *LaserDynamics* lies with whether apportioning to the smallest salable patent practicing unit for the royalty base constitutes the entire apportionment step. That is, does the royalty rate also have to account for apportionment? As discussed in Section II.A.5, patentees should only be allowed to invoke the entire market value of the product in calculating reasonable royalties when the patent-at-issue drives consumer demand for the smaller base. Otherwise, patentees could receive damages for features they did not invent. When demand for even the smallest salable unit is not driven by the patent-at-issue, then further

---

158.   *Id.* at *2.
159.   *Id.*
160.   *See* Seaman, *supra* note 154, at 1713–15.
161.   WMS Gaming, Inc. v. Int'l Game Tech., 184 F.3d 1339, 1355 (Fed Cir. 1999).

apportionment is required or else the EMVR would be violated with respect to the smaller unit.[162] This leads to the practical question of how to determine a royalty rate.

The choice of a royalty rate is dependent on the royalty base. This becomes obvious when considering the vastly different possible bases discussed in Section III.A. The royalty rate might be fifty percent if the royalty base is taken to be the incremental profits contributed by the patent, such as when the Nash bargaining solution is employed. However, in situations where the product's revenue is used as the royalty base, a fifty-percent royalty rate would be unimaginable. Therefore, each method of determining a royalty rate must be properly linked to the method of determining the royalty base.

1. Baseline Percentage

Traditionally, courts have started from a baseline percentage determined either from comparable licenses or the twenty-five percent rule of thumb, and then adjusted according to the *Georgia-Pacific* factors.[163] However, with the Federal Circuit's ban on the twenty-five percent rule of thumb, the Nash bargaining solution may become an alternative starting point, if the facts of the case support its use.[164]

a) Comparable Licenses

Comparable licenses include royalties the patentee receives for licensing the patent-in-suit and rates the licensee pays for use of other comparable patents.[165] Although reasonable arguments could be made for each of these factors to be the starting point in determining a royalty rate, the Federal

---

162. *See* Dynetix Design Solutions, Inc. v. Synopsys, Inc., No. C 11-05973, 2013 WL 4538210, at *3 (N.D. Cal. Aug. 22, 2013).

163. *See* Uniloc USA, Inc. v. Microsoft Corp., 632 F.3d 1291, 1312–14 (Fed. Cir. 2011).

164. *See infra* Section II.B.1.

165. This is encompassed by *Georgia-Pacific* factors one and two. Some commentators have also argued that the average licensing rates in an industry should be the starting point for calculating reasonable royalties. *See* Atanu Saha & Roy Weinstein, *Beyond* Georgia-Pacific: *The Use of Industry Norms as a Starting Point for Calculating Reasonable Royalties*, MICRONOMICS, http://www.micronomics.com/articles/intellectualproperty_2.pdf (last visited Feb. 11, 2014). However, the same issues that are present in stereotyping are also present in this analysis. Each patent is unique and each case has its own specific set of facts. Although this approach may work generally, it may not be representative of the patent-at-issue in every case. Furthermore, industry licensing rates may fall under a wide range and the average value may not reflect the circumstances of either the infringer or the patentee.

Circuit has increased the level of scrutiny in assessing whether licenses are truly "comparable."[166]

In *Lucent*, the plaintiff's expert provided eight comparable licenses that the defendant had agreed to as part of his analysis of the second *Georgia-Pacific* factor.[167] However, under the Federal Circuit's examination, there was insufficient evidence on the subject matter of the licensing agreements to conclude that the licenses offered by the plaintiff were actually "comparable licenses."[168] Lucent characterized four of the agreements as "PC-related patents," as if all patents related to personal computers were comparable.[169] Another supposedly "comparable" license was actually a license for IBM's entire patent portfolio, the same portfolio that protected IBM's dominance of the personal computer market back in the 1980s. (Compare this to Lucent's Day patent, a patent for picking dates).[170]

Similarly, in *ResQNet*, the Federal Circuit vacated and remanded a damages award based on comparable licenses the plaintiff had received from other parties, partly because it determined that the licenses were not actually comparable. The plaintiff's expert based his damages on seven licenses ResQNet had negotiated in the past.[171] However, five of the seven licenses did not even mention the patents in suit and were not related to the claimed technology.[172] Therefore, whether any of the aforementioned categories of comparable licenses should be used as a baseline royalty rate in any given case is a highly fact-specific question.

Comparable licenses often provide the best starting points for a reasonable royalty rate. However, parties and courts must look at the circumstances of the comparable license and the claimed technology to ensure that the licenses are actually sufficiently comparable.

b) Nash Bargaining Solution

The Nash bargaining solution calculates the percentage each party should receive of the profits resulting from their collaboration. The Nash bargaining solution arrives at its even profit-splitting by assuming that neither party is able to monetize the patented technology without entering into a license with

---

166. *See* Lucent Techs., Inc. v. Gateway, Inc., 580 F.3d 1301, 1327–31 (Fed. Cir. 2009); ResQNet.com v. Lansa, Inc., 594 F.3d 860, 869–72 (Fed. Cir. 2010).
167. *Lucent*, 580 F.3d at 1327–28.
168. *Id.* at 1328.
169. *Id.*
170. *Id.*
171. *ResQNet*, 594 F.3d at 870.
172. *Id.*

the other.[173] In this situation, both parties have equal bargaining power and there are no disagreement profits. However, this assumption is very rarely true. For example, the patentee could be capable of finding another licensee or manufacturing the product on its own. Similarly, the prospective licensee could substitute a similar technology, use older technology, invest in its own design-around, or turn to other non-infringing alternatives. In these instances, the disagreement profits would not be zero nor would there be equal bargaining power. Therefore, parties seeking to use the Nash bargaining solution framework to arrive at a baseline royalty rate must be able to support their proposed baseline rates with sufficiently convincing evidence.

Furthermore, it is important to remember that the Nash bargaining solution royalty rate must be tied to the Nash bargaining solution base, which is likely *not* the market value of the product. The Nash bargaining solution limits the royalty base to the incremental profits resulting from the licensee and patentee's collaboration. It would be improper to evenly split the value of the product revenue, in effect creating a fifty percent rule of thumb to replace the prohibited twenty-five percent rule of thumb, unless the resulting incremental share is equal to the incremental profit, which is unlikely in multi-component products.

2. *Adjusting the Baseline:* Georgia-Pacific *and Beyond*

Once a court has selected the baseline royalty rate, the *Georgia-Pacific* factors can be used to shift the royalty rate up or down. These factors are not exclusive, nor are they mandatory.[174] The Federal Circuit has consistently viewed the *Georgia-Pacific* factors as simply "a list of admissible factors informing a reliable economic analysis," leaving open the possibility of allowing juries to consider relevant information outside the scope of the *Georgia-Pacific* factors.[175] Furthermore, the jury is given the discretion to weigh each factor.[176] Although scholars have debated the relative importance of

---

173. *See infra* Section II.B.1.

174. *See* Whitserve, LLC v. Computer Packages, Inc., 694 F.3d 10, 31 (Fed. Cir. 2012) (finding that experts are not required to use any or all of the factors); Micro Chem., Inc. v. Lextron, Inc., 317 F.3d 1387, 1393 (Fed. Cir. 2003) (noting that the *Georgia-Pacific* factors were among the factors considered).

175. Energy Transp. Grp. v. William Demant Holding A/S, 697 F.3d 1342, 1357 (Fed. Cir. 2012).

176. *See* Georgia-Pacific Corp. v. U.S. Plywood Corp., 318 F. Supp. 1116, 1120–21 (S.D.N.Y. 1970). ("[T]here is no formula by which these factors can be rated precisely in the order of their relative importance or by which their economic significance can be automatically transduced into their pecuniary equivalent.").

each factor, the only indispensable factor under apportionment analysis is factor thirteen.[177] Factor thirteen is the apportionment factor and takes into account "the portion of realizable profit attributable to the invention as distinguished from non-patented elements."[178] As such, courts should separate this factor and give it special deference in determining a reasonable royalty.[179] The following Section identifies other factors in addition to the *Georgia-Pacific* factors that may be relevant in adjusting the royalty rate.

a) Incremental Profit from the Patent-at-Issue

As discussed in Section III.A, a patent is only as valuable as what it is able to contribute over the next-best non-infringing alternative. The next-best alternative can take the form of licensing a replacement technology, coming up with a design-around, or exiting the market.[180] The challenge in evaluating this factor is that in many cases involving complex multi-component products, the incremental profits derived from an infringed patent are difficult to isolate because the patent provides benefits that are only realized when combined with the other components.[181] However, royalty awards must reflect only the value of the patent and exclude compensation for non-patented components. Otherwise, the patentee is overcompensated and the inherent balance between monopoly and innovation is upset.

b) Consumer Valuation

Features that are used most often by the consumer or features that consumers value the most are more valuable because they likely tie customers to the product and therefore, should receive a higher royalty rate. This factor is similar to the incremental profit provided by the patent-at-issue because both factors take into account the value attributable to the patent. However, the "value" considered by this factor comes from the consumer's perspective rather than the infringer's. This definition of value can be determined through consumer surveys, usage rates of the patented feature, or the general appeal of the feature.

---

177. *See* Bensen & White, *supra* note 30; Cotter, *supra* note 125; Saha & Weinstein, *supra* note 165.

178. *Georgia-Pacific*, 318 F. Supp. at 1120.

179. *See* Bensen & White, *supra* note 30, at 38 (arguing that the apportionment factor should be the threshold question in a reasonable royalty analysis).

180. *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, 814 (2013).

181. *See* Geradin & Layne-Farrar, *supra* note 77, at 768.

Although consumer valuation has not yet been successfully used to exclusively establish a reasonable royalty, it is intuitive that the value consumers attach to patented features should be considered as a factor when determining royalty rates. Apple recently provided an example of an attempt to use consumer valuation to calculate a reasonable royalty in *Apple v. Motorola*.[182] In this case, the patent-at-issue dealt with a notification bar. Apple arrived at its royalty figure by relying on a survey where fifteen percent of those surveyed responded that "appealing features and functions" were among the top five reasons they bought a $270 Motorola cell phone.[183] Another four percent of respondents stated that they reviewed notifications every day.[184] Apple's expert subsequently multiplied the $270 figure by fifteen percent and four percent and then arbitrarily divided by two to arrive at a running royalty figure of $0.80 per phone, which the court summarily dismissed.[185] However, while Apple was ultimately unsuccessful in its attempt to use the consumer valuation data to set a royalty base, this case is still illustrative of how consumer valuation could potentially be used as a factor in setting royalty rates. The low number of respondents who use the notifications bar coupled with the vagueness of identifying the notification bar as an "appealing feature and function" would likely be interpreted as factors for decreasing the royalty rate.

IV.   PROPOSAL: DECISION-MAKING TREE IN CALCULATING REASONABLE ROYALTIES

The figure below summarizes how parties to litigation should generally approach different situations in the reasonable royalty context. Figure 1 gives more details of each case and which tools are appropriate for that case.
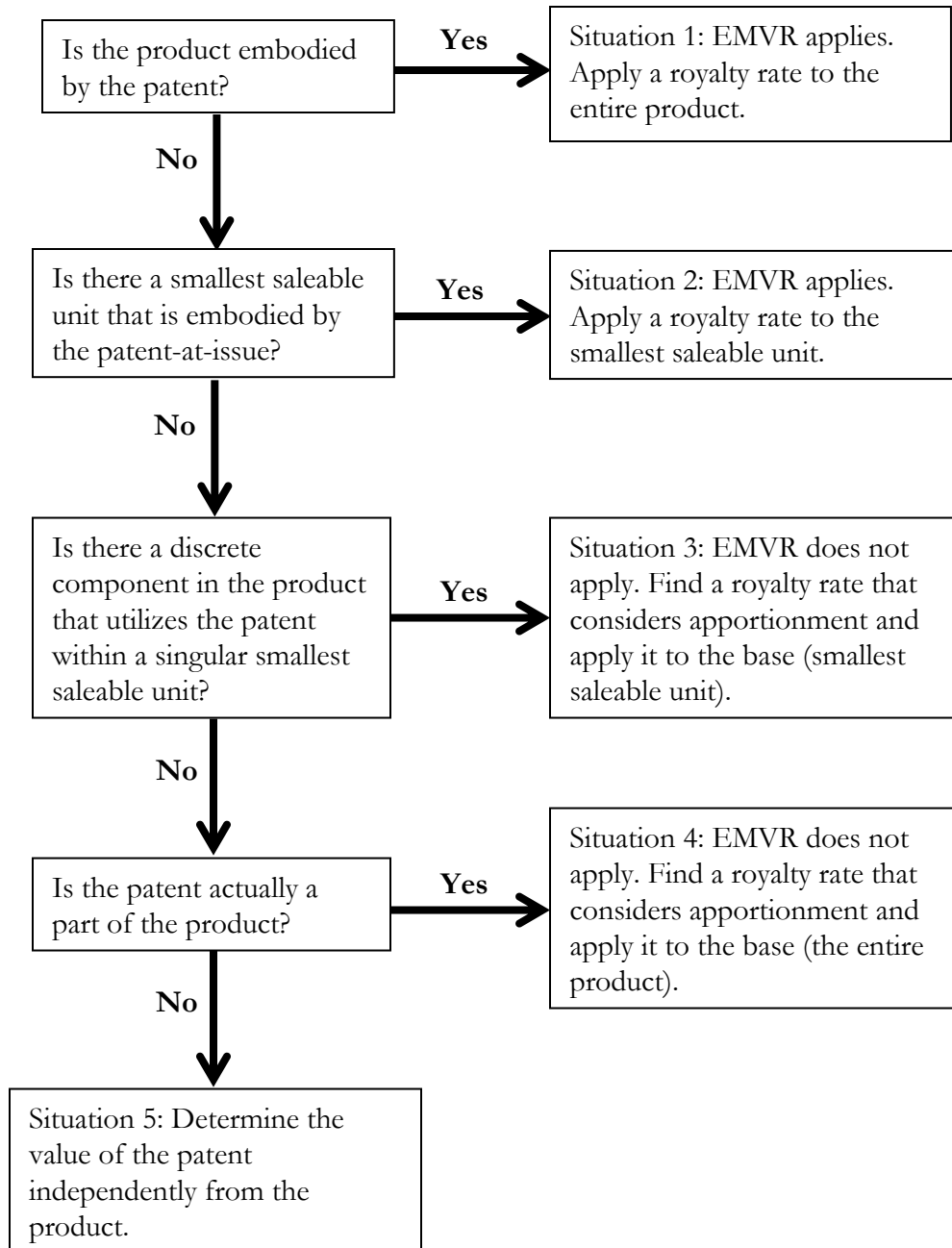
---

182.   *See* Apple, Inc. v. Motorola, Inc., No. 11-cv-08540, 2012 WL 1959560 (N.D. Ill. May 22, 2012).

183.   *Id.* at *4.

184.   *Id.*

185.   *Id.* at *4, *7.

Figure 1: Deciding on a Reasonable Royalty Calculation Methodology

Is the product embodied by the patent?	**Yes** →	Situation 1: EMVR applies. Apply a royalty rate to the entire product.

No ↓

Is there a smallest saleable unit that is embodied by the patent-at-issue?	**Yes** →	Situation 2: EMVR applies. Apply a royalty rate to the smallest saleable unit.

No ↓

Is there a discrete component in the product that utilizes the patent within a singular smallest saleable unit?	**Yes** →	Situation 3: EMVR does not apply. Find a royalty rate that considers apportionment and apply it to the base (smallest saleable unit).

No ↓

Is the patent actually a part of the product?	**Yes** →	Situation 4: EMVR does not apply. Find a royalty rate that considers apportionment and apply it to the base (the entire product).

No ↓

Situation 5: Determine the value of the patent independently from the product.

A.   SITUATION 1: A PRODUCT WITH A SINGLE PATENT

In a first illustrative situation, imagine a product fully defined by a single patent. An example of this would be a drug that is based on a patented compound.[186] This situation would be a straightforward application of the EMVR: the patentee would be allowed to use the entire market value of the product as the royalty base. Conjoint analysis and consumer surveys may prove useful in determining whether the patented feature actually forms the basis for consumer demand.

The baseline royalty rate can be determined from comparable licenses and later adjusted with the *Georgia-Pacific* factors. If no comparable licenses exist, the Nash bargaining solution could provide a starting point if the assumptions are reflected by the facts of the case. The Nash bargaining solution starting rate would similarly be adjusted by an evaluation of the *Georgia-Pacific* factors. Because the patent drives demand for the product in this situation, there is unlikely to be fears of royalty stacking from other licenses and there should be a presumption of a higher royalty rate. Here, the apportionment factor is not considered because the conclusion that the EMVR applies necessarily means that the entirety of the product is attributable to the patent.

B.   SITUATION 2: A PRODUCT WITH A COMPONENT COVERED BY A
          SINGLE PATENT

In this situation the product contains a component that is both the smallest salable patent-practicing unit and is embodied by a single patent. The facts from *Cornell* potentially fall under this category if the court determined that the patent for the microprocessor function drove demand for the microprocessor.[187] In this case, the EMVR would not apply to the CPU or computer; rather, the patentee would use the microprocessor as the royalty base. The analysis here would be nearly identical to Situation 1, except the royalty base would be limited to the relevant component, the smallest salable patent-practicing unit, of the product.

C.   SITUATION 3: A PRODUCT WITH A NON-MARKET DRIVING PATENT

In this situation, a product contains a component that is the smallest salable unit of a product, and a patent covers that smallest salable unit, but the patent does not drive demand for the smallest salable unit. An example

---

186. This is unlikely to be the case in the high-tech industry as most products read on many patents.

187. Cornell Univ. v. Hewlett-Packard Co., 609 F. Supp. 2d 279, 283–84 (2009).

of this situation would be *Lucent*, where the Day Patent was part of Microsoft Outlook, which was the smallest salable unit of Microsoft Office, but the Day Patent did not drive demand for Microsoft Outlook.[188] Although Microsoft Outlook is a standalone program that appears more "comprehensive" than the smallest salable patent practicing unit should be, Microsoft Office could not be broken down into a smaller component as Microsoft does not sell pieces of Outlook or specific functionalities separately.

The EMVR does not apply in this situation because the patent-at-issue does not drive demand for the smallest salable unit, so further apportionment is needed. If there is a comparable license, then it can form the baseline royalty rate that can be adjusted depending on the *Georgia-Pacific* factors and the additional factors listed in Section III.B.2 Otherwise, the reasonable royalty base should be determined by the incremental benefit provided by the patent: either the cost of capital for the infringer to create a design-around or the cost of procuring a license for a substitute technology. Both valuations can be considered, with the one that has the strongest evidence receiving the most weight. In this case, because the EMVR does not apply, the royalty rate must account for the apportionment factor.

D.   SITUATION 4: A PRODUCT COVERED BY MULTIPLE PATENTS

In this situation, in which a product is covered by multiple patents, there is no smallest salable unit that practices a single patent. In other words, the entire product is the smallest salable unit, but the allegedly infringing patent does not define the entire product. Here, the value of the patent must be determined relative to the entire product. Although the entire product is used as a base, this does not violate the EMVR because the entire product is the smallest salable unit.[189] Additionally, the apportionment will be carried out during the royalty rate analysis. The analysis in this scenario is similar to Situation 3, except the base is larger. This presents some complications with combinatorial explosion if conjoint analysis is used, but fractional factorial designs provide a potential solution to reduce the number of attributes. Additionally, because these methods isolate the patent's contributions to the product, there is less of a concern that the larger base will lead to overcompensation than if only the *Georgia-Pacific* factors were used.

---

188. Lucent Techs., Inc. v. Gateway, Inc., 580 F.3d 1301, 1308–09 (Fed. Cir. 2009).

189. *See* Tomita Techs. USA, LLC. v. Nintendo Co., Ltd., No. 11 Civ. 4256, 2013 WL 4101251 (S.D.N.Y. Aug. 14, 2013) (finding the EMVR was not implicated even though the Nintendo 3DS gaming system was used as the royalty base because the 3DS itself was the smallest saleable patent-practicing unit in which the patent's technology was utilized).

E.   SITUATION 5: A NON-MARKET DRIVING PATENT DIVORCED FROM
         CONSUMER DEMAND

Here, the patent is not actually a feature consumers look for when they use the product. In contrast to Situation 3, the patent here covers a technology that is extrinsic to the core functionality of the product. An example of this is *Uniloc*, where the patented software registration system was not part of Microsoft Office or Window's operations.[190] There, the software, which was what consumers were paying for, did not run on or incorporate the *Uniloc* patent; the patented technology was completely divorced from consumer demand. There is no reason why the reasonable royalties should be tied to the product in this case. Because the patented feature is not part of the user experience, there is no way to determine its contribution to the product. Conjoint analysis is unlikely to be useful here as the feature is not tied to consumer use of the product. In *Uniloc*, the royalty figures were suggested independent of their contribution to the product. Following that precedent, the value of the patent can be determined relative to the next-best non-infringing alternative or the cost of a design-around without tying the patent to the product. In this situation, multiplying a dollar amount by the number of units sold avoids the need for determining a royalty base.

V.   CONCLUSION

The higher stakes and increasing frequency of patent litigation has brought patent damages into the spotlight. Specifically, concerns regarding massive awards to non-practicing entities spurred the Federal Circuit to revisit the entire market value rule and apportionment in the context of reasonable royalties. With its recent string of decisions in *Lucent*, *Uniloc*, and *LaserDynamics*, the Federal Circuit has clarified and limited the application of the EMVR and reintroduced apportionment as a central theme in addressing damages on infringing multi-component products. Furthermore, the debut of conjoint analysis and the Nash bargaining solution in reasonable royalty calculations has increased the tools available for courts to determine royalty figures. However, the addition of new methodologies also increases the risk of misapplying accepted concepts in inappropriate situations. Courts can guard against this danger by retaining a strong grasp on when certain methodologies may be more appropriate.

---

190.   Uniloc USA, Inc. v. Microsoft Corp., 632 F.3d 1292, 1296 (Fed. Cir. 2011).

APPENDIX: NASH BARGAINING SOLUTION DERIVATION

The NBS divides the surplus from the license according to five conditions:[191]

(1) Pareto efficiency, when there is no other solution where one party can be better off without making the other party worse off;

(2) neither party's share (π_1 and π_2) of the total profits (Π) is less than its disagreement profits (d_1 and d_2);

(3) the solution is independent of how payoffs are measured;

(4) eliminating alternatives that were not chosen does not affect the solution;

(5) if the parties have equal bargaining positions, then the solution treats them equally.

Nash proved that there is only one point or solution that could satisfy the five conditions, which can be found though the following maximization problem:[192]

$$\max(\pi_1 - d_1)(\pi_2 - d_2)$$

Subject to the conditions for equilibrium payoff where π_i^* is the equilibrium payoff for party i

$$\pi_1^* - d_1 = \pi_2^* - d_2 \text{ (equation 1)}$$

$$\pi_1^* + \pi_2^* = \Pi \text{ (equation 2)}$$

Equation 1 can be rearranged to express π_1^* in the following manner:

$$\pi_1^* = \pi_2^* - d_2 + d_1 \text{(equation 3)}$$

Substituting equation 3 for the value of π_1^* in equation 2 yields:

$$\pi_2^* - d_2 + d_1 + \pi_2^* = \Pi$$

$$2\pi_2^* = \Pi - d_1 + d_2$$

---

191. *See* Platt & Chen, *supra* note 128; Choi & Weinstein, *supra* note 40, at, page 53–54.

192. *See* Platt & Chen, *supra* note 128; Choi & Weinstein, *supra* note 40, at, page 53–54.

The same steps can be applied to isolate the variable π_1^*. Then, solving the equations for π_1^* and π_2^* respectively yields the Nash bargaining solution:

$$\pi_1^* = d_1 + \frac{1}{2}(\Pi - d_1 - d_2)$$

$$\pi_2^* = d_2 + \frac{1}{2}(\Pi - d_1 - d_2)$$

BERKELEY TECHNOLOGY LAW JOURNAL
ANNUAL REVIEW OF LAW AND TECHNOLOGY

COPYRIGHT LAW