



PATENTEE OVERCOMPENSATION AND THE ENTIRE
MARKET VALUE RULE

Brian J. Love

NOTE

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* J.D., Stanford Law School, 2007; B.S.E.E., The University of Texas at Austin, 2004. Law Clerk to the Honorable David C. Godbey, U.S. District Court for the Northern District of Texas, 2007-2008. I would like to extend special thanks to Mark Lemley for his invaluable mentorship and guidance. Thanks also to Laura Love for her unending support in all that I do. I am also grateful to Amy Landers for comments on a previous draft. In heartfelt memory of my close friend Cpl. Jacob H. Neal, USMC, who gave his life in service to his country on January 19, 2007 in Al Anbar province, Iraq.

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INTRODUCTION

Imagine a computer chip composed of millions of transistors and hundreds or even thousands of individually patented inventions. Could just *one* of those patented components ever account for the entire economic value of the chip? Could just one such invention ever account for the entire value of a total personal computer system—monitor, keyboard, mouse, printer, software, and all—sold along with the chip? While these questions may seem far-fetched, they may soon be answered in the affirmative under a U.S. patent law doctrine known as the “entire market value rule.”

The entire market value rule allows for recovery of patent infringement damages based on the value of an entire product or device containing an infringing component, rather than on the value of the infringing component alone, provided that the entire value of the device as a whole is legally attributable to the patented invention.¹ The doctrine can mean the difference between orders of magnitude in potential patent infringement liability, and yet, surprisingly, the rule has been largely ignored by scholars of the U.S. patent system. This Note asks whether the entire market value rule remains a viable doctrine in a world of increasing technological complexity in which new products are generally not covered by a single patent, but instead incorporate many patentable components. While the U.S. patent system was designed primarily on the premise that new inventions would be covered by a single patent, recent advances in technology have ushered in an era of unprecedented complexity and detail in technological innovation. Gone are the days when inventions were primarily simple mechanical devices.² Now, the patent system must adapt to accommodate areas of rapid advancement—such as the computing and biotechnology industries—where products sold to consumers consist of numerous components, each of which may itself be a patented invention.

1. See *Imonex Servs., Inc. v. W.H. Munzprufer Dietmar Trenner GmbH*, 408 F.3d 1374, 1379 (Fed. Cir. 2005) (“The entire market value rule ‘permits recovery of damages based on the value of the entire apparatus containing several features, where the patent related feature is the basis for customer demand.’” (quoting *State Indus., Inc. v. Mor-Flo Indus., Inc.*, 883 F.2d 1573, 1580 (Fed. Cir. 1989))).

2. John R. Allison & Mark A. Lemley, *The Growing Complexity of the United States Patent System*, 82 B.U. L. REV. 77, 93 (2002) (“The percentage of mechanical . . . patents dropped precipitously from the 1970s to the 1990s. . . . Mechanical patents accounted for more than half of all patents issued in the 1976-1978 period, but less than a third of those issued twenty years later.”).

This Note demonstrates that application of the entire market value rule routinely overcompensates patentees and thereby exacerbates many problems inherent in the current system for awarding patent infringement damages. It concludes that the doctrine's current form should be abandoned so that when calculating infringement damages the infringing device's value must *always* be apportioned between value added by the patent at issue and value attributable to the infringer's own contributions or to the public domain. In addition, it suggests a number of less drastic patent reform measures that, if adopted, can easily correct much of the doctrine's current overapplication. Part I introduces the current state of entire market value rule case law, emphasizing the expansion of the doctrine over time. It explains that, from its modest origins, the doctrine has been expanded far beyond the rationales behind its creation. Part II presents the case for modifying the entire market value rule by identifying how the doctrine frequently overcompensates patentees compared to their contributions to society. It first introduces and develops an economic model that demonstrates the doctrine's overcompensating effect. It then addresses the negative consequences that result when patents are overvalued. These consequences include a chilling effect on innovation and increased incentives for "patent trolling."³ The Part concludes by explaining how scaling back the entire market value rule would make the doctrine more predictable and easily administrable. Part III explores how the entire market value rule will likely be applied in future patent litigation involving complex electronic devices. Using a hypothetical infringing personal computer system as a case study, it explains that while complex devices will likely be aggressively targeted under current entire market value rule case law, scaling back the doctrine would largely eliminate its overapplication in this beneficial area. Drawing on the economic model introduced in Part II, Part IV suggests patent reform measures that can help counteract the overapplication of the entire market value rule and the problems caused by the overvaluation of patented inventions.

I. PATENT DAMAGES FOR COMPONENT INVENTIONS

The determination of damages for patent infringement is "not an exact science."⁴ Section 284 of the United States Patent Act authorizes a patentee who successfully proves that its patent has been infringed to recover profits lost due to the infringer's unlawful conduct, "but in no event less than a reasonable

3. "Patent trolling" is, generally speaking, the practice of using patents not as a tool for producing and selling goods but, instead, for obtaining licensing fees from potential infringers. See generally Amy L. Landers, *Let the Games Begin: Incentives to Innovation in the New Economy of Intellectual Property Law*, 46 SANTA CLARA L. REV. 307, 343-47 (2006).

4. *King Instrument Corp. v. Otari Corp.*, 767 F.2d 853, 863 (Fed. Cir. 1985).

royalty” for use of the patented invention.⁵ An award for infringement under section 284 is intended to provide a patentee with “damages adequate to compensate” for the injury it sustained as a result of the infringement.⁶

A. General Standards for Patent Infringement Damages

A patentee’s compensation may be comprised of an award for lost profits, a reasonable royalty, or a combination thereof.⁷ Lost profits, however, can be hard to show. To obtain lost profits under *Panduit Corp. v. Stahl Bros. Fibre Works, Inc.*, a patentee must show: (i) consumer demand for the patented product, (ii) sufficient marketing and manufacturing capacity to exploit that demand, (iii) an absence of noninfringing substitutes, and (iv) the dollar amount of profit that it would have made from additional sales absent infringement.⁸

Patentees who cannot meet the *Panduit* test or who do not sell products covered by their patents may not recover lost profits. Such patent owners are only entitled to the reasonable royalty for which the infringer could have licensed the patent at issue. Mathematically, a reasonable royalty award requires a court to determine first the proper royalty base—the value of the infringing products or activities for which a royalty is owed—and then multiply that value by a royalty rate to calculate the total amount of damages. In setting a reasonable royalty rate for the license of an infringed patent, courts attempt to reconstruct the hypothetical bargain that the parties would have negotiated at the time when the infringing conduct began.⁹ To accomplish this task, courts look to a nonexclusive list of fifteen factors first set out in *Georgia-Pacific*

5. 35 U.S.C. § 284 (2000). In addition to damages, 35 U.S.C. § 283 (2000) permits courts to grant injunctive relief preventing the infringer from continuing its infringing activities. While permanent injunctive relief was generally entered as a matter of course following a finding of infringement, the Supreme Court’s recent decision in *eBay, Inc. v. MercExchange, L.L.C.*, 126 S. Ct. 1837 (2006), may make such relief less certain. Further discussion of injunctive relief, however, is beyond the scope of this article.

6. 35 U.S.C. § 284.

7. *See, e.g.*, *Minco, Inc. v. Combustion Eng’g, Inc.*, 95 F.3d 1109, 1119 (Fed. Cir. 1996) (“The Patent Act permits damages awards to encompass both lost profits and a reasonable royalty on that portion of an infringer’s sales not included in the lost profit calculation.”).

8. 575 F.2d 1152, 1156 (6th Cir. 1978).

9. *Id.* at 1157-58 (“A reasonable royalty is an amount ‘which a person, desiring to manufacture and sell a patented article, as a business proposition, would be willing to pay as a royalty and yet be able to make and sell the patented article, in the market, at a reasonable profit.’” (quoting *Goodyear Tire and Rubber Co. v. Overman Cushion Tire Co.*, 95 F.2d 978, 984 (6th Cir. 1937))). Those familiar with contract law may recognize this *ex post* recreation of the hypothetical negotiation that the parties would have struck had they bargained as a form of restitution-style damages. ROBERT PATRICK MERGES & JOHN FITZGERALD DUFFY, *PATENT LAW AND POLICY: CASES AND MATERIALS* 1078 (3d ed. 2002).

*Corp. v. United States Plywood Corp.*¹⁰ In particular, courts rely heavily on evidence pertaining to the rates at which the patent owner previously licensed the patented invention.¹¹ This fictitious negotiation is notably distorted from reality in a number of respects. For example, in reconstructing this *ex ante* bargain, courts presume that the patent is valid and covers the infringer's product¹²—facts that were likely not at all clear prior to the resolution of the infringement suit. Moreover, the very existence of the infringement suit proves that the parties were in fact not able to strike a bargain prior to infringement or

10. 318 F. Supp. 1116, 1120 (S.D.N.Y. 1970). The factors are:

1. The royalties received by the patentee for the licensing of the patent in suit, proving or tending to prove an established royalty. 2. The rates paid by the licensee for the use of other patents comparable to the patent in suit. 3. The nature and scope of the license, as exclusive or non-exclusive; or as restricted or non-restricted in terms of territory or with respect to whom the manufactured product may be sold. 4. The licensor's established policy and marketing program to maintain his patent monopoly by not licensing others to use the invention or by granting licenses under special conditions designed to preserve that monopoly. 5. The commercial relationship between the licensor and licensee, such as, whether they are competitors in the same territory in the same line of business; or whether they are inventor and promoter. 6. The effect of selling the patented specialty in promoting sales of other products of the licensee; that existing value of the invention to the licensor as a generator of sales of his non-patented items; and the extent of such derivative or convolved sales. 7. The duration of the patent and the term of the license. 8. The established profitability of the product made under the patent; its commercial success; and its current popularity. 9. The utility and advantages of the patent property over the old modes or devices, if any, that had been used for working out similar results. 10. The nature of the patented invention; the character of the commercial embodiment of it as owned and produced by the licensor; and the benefits to those who have used the invention. 11. The extent to which the infringer has made use of the invention; and any evidence probative of the value of that use. 12. The portion of the profit or of the selling price that may be customary in the particular business or in comparable businesses to allow for the use of the invention or analogous inventions. 13. The portion of the realizable profit that should be credited to the invention as distinguished from non-patented elements, the manufacturing process, business risks, or significant features or improvements added by the infringer. 14. The opinion testimony of qualified experts. 15. The amount that a licensor (such as the patentee) and a licensee (such as the infringer) would have agreed upon (at the time the infringement began) if both had been reasonably and voluntarily trying to reach an agreement; that is, the amount which a prudent licensee—who desired, as a business proposition, to obtain a license to manufacture and sell a particular article embodying the patented invention—would have been willing to pay as a royalty and yet be able to make a reasonable profit and which amount would have been acceptable by a prudent patentee who was willing to grant a license.

Id.

11. *See, e.g., T.J. Smith & Nephew Ltd. v. Parke, Davis & Co.*, 9 F.3d 979 (Fed. Cir. 1993) (unpublished table decision) (“Proof of an established royalty for the patent in suit is indeed one of the strongest measures of a reasonable royalty.”).

12. *See* ROGER D. BLAIR & THOMAS F. COTTER, *INTELLECTUAL PROPERTY: ECONOMIC AND LEGAL DIMENSIONS OF RIGHTS AND REMEDIES* 229-30 (2005) (“[F]or purposes of these hypothetical negotiations, the patent is presumed to be valid and the defendant's proposed use infringing”); 7 DONALD S. CHISUM, *CHISUM ON PATENTS* § 20.03[3][a] (7th ed. 2002) (“The [hypothetical reasonable royalty] negotiation is based on the assumption that the patent was valid.”); *see also Rite-Hite Corp. v. Kelley Co.*, 774 F. Supp. 1514, 1535 (E.D. Wis. 1991) (“[T]he patentee is presumed to know that the patent is valid and infringed.”).

at any time afterwards. While counterfactual, these considerations may be necessary to avoid undercompensation.¹³

B. *The Apportionment Requirement*

Once the finder of fact has decided to award monetary damages, it must determine what compensation base to use in calculating the patentee's lost profits or the reasonable royalty owed by the infringer. When a patent covers an entire infringing product, the royalty base is simply the total value of the sales or uses of the infringing product.¹⁴ However, when the patent at issue covers only a component of or improvement to the infringing item, the value of the sales or uses of that item must be apportioned between the patented invention and the remaining unpatented¹⁵ components.¹⁶ This requirement ensures that a patentee is normally awarded damages in proportion to the value that its patent contributed to the infringing article, and not based on any value attributable to the infringer's own inventions or the prior art.

Courts have long recognized that damages awards should differ depending on whether the patent at issue covers the entire infringing product or instead covers only a component of or improvement to the infringing product. In *Seymour v. McCormick*, for example, the U.S. Supreme Court reversed an award for infringement of an improvement patent based on the value of an entire machine including the improvement, stating that "it is 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."¹⁷ The Court recognized that if patent damages were not calculated after apportioning value between the patented invention and the prior art, "the

13. BLAIR & COTTER, *supra* note 12, at 230 ("The presumption [that the patent at issue is valid in the hypothetical negotiation] nevertheless makes economic sense, because an award that reflected the parties' uncertainty at the time of the hypothetical negotiations in effect would require the plaintiff to bear the risk of uncertainty twice: first, at the time of those negotiations, and second when deciding whether to proceed to trial.").

14. *See, e.g.*, *Hynix Semiconductor, Inc. v. Rambus, Inc.*, No. CV-00-20905 RMW, 2006 WL 1991760, at *1 n.2 (N.D. Cal. July 14, 2006) (stating that the royalty base was given by the parties' stipulation of the amount of total sales of the accused products).

15. Here, the term "unpatented" is meant to convey that the components are not covered by the patent at issue in the case—not that they are completely unpatented. This convention is also followed in the case law. *See Rite-Hite Corp. v. Kelley Co.*, 56 F.3d 1538, 1551 (Fed. Cir. 1995) (explicitly defining "unpatented" as "not covered by the patent in suit"); *see also Imonex Servs., Inc. v. W.H. Munzprufer Dietmar Trenner GmbH.*, 408 F.3d 1374, 1379 (Fed. Cir. 2005) (describing the entire market value rule in terms of a patented feature sold along with "unpatented components" even though the plaintiff sought to recover damages under the doctrine based on laundry machine components, some of which were almost certainly independently patented). Components of a complex device may, of course, be covered by a multitude of patents. The practical effects of this fact are addressed below in Part II.B.2's discussion of "royalty stacking."

16. *See, e.g.*, *Seymour v. McCormick*, 57 U.S. 480, 490-91 (1853).

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

unfortunate mechanic [who sells a complex device] may be compelled to pay treble his whole profits to each of a dozen or more several inventors of some small improvement in the [device] he has built.”¹⁸

C. *The Evolution of the Entire Market Value Rule*

Under certain circumstances, however, patent law allows the patentee of an invention comprising only a component of or improvement to a larger article to recover lost profit or reasonable royalty damages based on the value of the entire infringing article.¹⁹ This exception to the requirement of apportionment is known as the “entire market value rule.”²⁰

As originally conceived, the entire market value rule was not so much an exception to the apportionment requirement as a term of art used to explain away the need for apportionment when a patented component accounted for the entire value of a larger infringing item.²¹ In such a scenario, apportionment is not necessary because the entire value of the sales or uses of the infringing article is attributable to the patented invention. The doctrine traces its roots back to *Garretson v. Clark*, in which the U.S. Supreme Court implicitly suggested that such a rule might exist, while actually emphasizing the need to apportion damages.²² The Court first stressed the need for apportionment, stating that “[w]hen a patent is for an improvement, and not for an entirely new machine or contrivance, the patentee must show in what particulars his improvement has added to the usefulness of the machine or contrivance . . . [and] separate its results distinctly from those of the other parts, so that the

18. *Id.* at 490. In this passage, the Court recognizes the possibility of what is commonly referred to as “royalty stacking.” This idea is explored in detail by Mark A. Lemley & Carl Shapiro in *Patent Holdup and Royalty Stacking*, 85 TEX. L. REV. 1991 (2007), and discussed *infra* Part II.B.2.

19. The entire market value rule may apply in both reasonable royalty and lost profits patent infringement damages computations. *Rite-Hite*, 56 F.3d at 1549 (explaining that the entire market value rule may apply “whether for reasonable royalty purposes, or for lost profits purposes” (internal citations omitted)); see also *Juicy Whip, Inc. v. Orange Bang, Inc.*, 382 F.3d 1367, 1371 (Fed. Cir. 2004) (“[T]he entire market value rule [is] a principle of patent damages that define[s] a patentee’s ability to recover *lost profits*” (emphasis added)); *Bose Corp. v. JBL, Inc.*, 274 F.3d 1354, 1361 (Fed. Cir. 2001) (“In determining the appropriate basis for calculating a *royalty base* the court may use the ‘entire market value rule.’” (quoting *Fonar Corp. v. Gen. Elec. Co.*, 107 F.3d 1543, 1552 (Fed. Cir. 1997) (emphasis added))).

20. See, e.g., *Velo-Bind, Inc. v. Minn. Mining & Mfg. Co.*, 647 F.2d 965, 973 (9th Cir. 1981) (“[T]he entire market value rule . . . is itself an exception to the more general rule that, where the patent creates only part of the profits, damages are limited to that part of the profits, which must be apportioned as between those created by the patent and those not so created.”).

21. For further information on the history of apportionment, the entire market value rule, and legal standards for calculating reasonable royalty awards, see Landers, *supra* note 3, at 354-62.

22. 111 U.S. 120 (1884).

benefits derived from it may be distinctly seen and appreciated.”²³ Only then did the Court go on to favorably quote the opinion below:

The 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, and such evidence must be reliable and tangible, and not conjectural or speculative; or he must show, by equally reliable and satisfactory evidence, that the profits and damages are to be calculated on the whole machine, for the reason that the entire value of the whole machine, as a marketable article, is properly and legally attributable to the patented feature.²⁴

Thus, in *Garretson* the Court merely acknowledged that to properly award damages, the value of the patented invention must be dissociated from the value of the unpatented components of the infringing article *or* the patented invention must be shown to account for the entire market demand for the infringing article. Accordingly, at the time of its formulation, the “entire market value rule” simply allowed a patentee whose patent covered only a component of or improvement to an infringing article to recover damages based on the entire value of that article, provided that the patentee could show that sales of the article were properly attributable to the patented invention alone.

Soon after, however, courts began to expand the entire market value rule from its role as a special case of the rule of apportionment into a full-fledged exception to the apportionment requirement. In *Westinghouse Electric & Manufacturing Co. v. Wagner Electric & Manufacturing Co.*, for example, the Supreme Court incorporated the entire market value rule into a burden-shifting framework for proving damages, ruling that if apportionment was “impossible” the doctrine should be applied to award damages based on the value of the whole infringing article.²⁵ While this framework for damages calculation was ultimately abandoned after the enactment of section 284,²⁶ the Court openly displayed a willingness to allow for the compensation of patentees beyond the proven value of their inventions.

Despite attempts to lessen the burden of apportionment, application of the entire market value rule remained firmly tethered to the market demand attributable to the patented invention into the 1980s. In *Leesona Corp. v. United States*, for example, the Court of Claims reiterated that under the entire market value rule the determining factor in inclusion or exclusion from the compensation base is the “financial and marketing dependence [of the unpatented components] on the patented item.”²⁷ In *Leesona*, the court awarded damages based on the entire value of a portable, rechargeable battery system,

23. *Id.* at 121.

24. *Id.* (emphasis added).

25. 225 U.S. 604, 620-22 (1912).

26. *See Landers, supra* note 3, at 322.

27. 599 F.2d 958, 974 (Ct. Cl. 1979).

including unpatented anodes, cathodes, and battery covers.²⁸ The court agreed with the patentee that these unpatented items “derive[d] their utility and value from the patented invention.”²⁹

In the 1980s and 1990s, however, the Federal Circuit significantly expanded application of the entire market value rule beyond the ambit of consumer demand for a single, discrete device to allow for the recovery of damages based on any functionally related items foreseeably sold along with infringing articles. In *Paper Converting Machine Co. v. Magna-Graphics Corp.*, the Federal Circuit awarded damages based on the entire value of high-speed paper-winding equipment, including unpatented “auxiliary equipment,” even though the auxiliary devices were not physically connected to the accused machine and each of the unpatented devices had a separate use and therefore value independent of the patent at issue.³⁰ Signaling a change in entire market value rule jurisprudence, the court held that “the deciding factor” in application of the entire market value rule was no longer consumer demand but instead “whether [n]ormally the patentee (or its licensee) can anticipate sale of such unpatented components as well as of the patented’ ones.”³¹ Relying on evidence that consumers in the paper-winding industry routinely purchased entire sets of rewinder equipment from a single source, the court awarded the patentee damages on the entire set of infringing devices sold by the infringer.³²

In *Rite-Hite Corp. v. Kelley Co.*, the Federal Circuit first enunciated the current standard for the entire market value rule.³³ The court created a “functional unit test” under which the entire market value rule may be invoked to award damages based on any components of an accused device—even those not physically connected to the infringing component—so long as they function together with the patented invention as part of a single “functional unit.”³⁴ Since *Rite-Hite*, courts have frequently applied the entire market value rule to award damages for components that are unconnected to the infringing element of the accused device, yet which nevertheless function together with the accused device and are sold or marketed in conjunction with the infringing article.³⁵

28. *Id.* at 975-76.

29. *Id.* at 973.

30. 745 F.2d 11, 23 (Fed. Cir. 1984).

31. *Id.* (quoting *Tektronix, Inc. v. United States*, 552 F.2d 343, 351 (Ct. Cl. 1977)).

32. *Id.*

33. 56 F.3d 1538 (Fed. Cir. 1995).

34. *Id.* at 1550.

35. See *Juicy Whip, Inc. v. Orange Bang, Inc.*, 382 F.3d 1367, 1372-73 (Fed. Cir. 2004) (allowing damages award for lost profits on sale of syrup used in patented juice dispenser); *Paper Converting Mach.*, 745 F.2d at 23 (affirming damages award based on separate auxiliary equipment sold as part of a line of paper-winding products).

II. THE CASE FOR MODIFYING THE ENTIRE MARKET VALUE RULE

As a result of its expansion into a broad exception to the general rule of apportionment, the entire market value rule often overcompensates patentees through excessive awards of patent infringement damages. Using an economic model, this Part demonstrates that application of the entire market value rule overcompensates patentees unless the patent at issue accounts for the entire value of the accused product to the infringing firm.³⁶ When the doctrine is applied but the patent at issue accounts for less than this entire value, patentees are awarded for value they did not create.³⁷ This overcompensation results in socially undesirable consequences such as reduced incentives for investment in beneficial technology, increased risk of royalty stacking, and increased incentive for patent trolling. To prevent overcompensation and its attendant harms, the entire market value rule must be scaled back to its original role as a special case of the apportionment requirement, such that it may not be applied unless—as its name suggests—the patent at issue indeed accounts for the *entire* value of the infringing article. Furthermore, using the developed model, this Part concludes that modification of the doctrine would have the added benefit of making the doctrine more predictable and easier for the Federal Circuit to review on appeal.

A. *An Economic Model of Patentee Compensation*³⁸

Now that we have seen how courts have expanded the entire market value rule over time, this Part demonstrates that, as a result, the doctrine routinely overcompensates patentees relative to their inventive contribution to society. This subpart introduces an economic model with which we can observe and measure this overcompensating effect in reasonable royalty awards.³⁹

36. Here, and throughout this Article, the phrase “entire value to the infringing firm” (or “entire market/consumer demand”) should be read to mean the *total* value of the accused device to the infringing firm *less the value of the next best noninfringing alternative*—or, in other words, the entire value *added* by the accused device above its closest substitute.

37. See Amy L. Landers, *Liquid Patents*, 84 DENV. U. L. REV. 199, 256 (2006) (“[T]he trend over the past several years has been to award more of the infringer’s innovative activity to the patentee In part, this has been because the court has expanded the ‘entire market value’ rule.”).

38. This Part draws heavily from the economic model introduced in Lemley & Shapiro, *supra* note 18, at 1995-98. See also Carl Shapiro, *Injunctions, Hold-Up, and Patent Royalties* (Aug. 2006) (unpublished manuscript), available at <http://faculty.haas.berkeley.edu/Shapiro> (deriving the equations relied upon by Lemley and Shapiro).

39. While this economic model addresses only overcompensation resulting from application of the entire market value rule in the reasonable royalty context, the doctrine also routinely overcompensates patentees when used to award damages for lost profits on entire accused devices. This Part demonstrates that it is economically unsound to award a patentee a *royalty* for the use of value that the patentee did not create. Thus, it is similarly unsound to

1. *A benchmark royalty level*

To determine whether the entire market value rule overvalues patents, we must first set a benchmark for the socially desirable level of compensation. According to Lemley and Shapiro, the benchmark reasonable royalty—the royalty reward “that would be reasonable and expected in the ideal patent system *without* any element of hold-up”⁴⁰—in a patent infringement suit is given by the formula

$$B*V [(1)]$$

where B represents the relative bargaining power between the parties and V represents the value of the patented invention to the infringing firm—i.e., the total value per unit of the patented invention to the infringing firm less the value of the next best noninfringing alternative.⁴¹ This benchmark thus provides that, in an ideal system in which damages are awarded based on the royalty bargain that the patentee and infringer would have struck at the time of infringement, we would expect the parties to divide the economic surplus created by the patented invention.⁴²

award a patentee *profits* earned from value it did not create. For simplicity, and because reasonable royalty damage awards are far more common than lost profits awards, the following analysis will focus on overcompensation in the reasonable royalty context.

40. Lemley & Shapiro, *supra* note 18, at 1999.

41. More specifically, the Lemley-Shapiro benchmark royalty is given by the equation $\Theta*B*V$, where Θ represents the probability that the patent will be found valid and infringed in litigation (i.e., the patent strength). *Id.* at 1999-2000. This additional term takes into account the fact that in a true bargain struck between the parties at the time of infringement, the negotiated royalty rate will be discounted by the estimated strength of the patent at issue. *Id.* In the following analysis, we drop the patent strength term because patent infringement damages are calculated after the patent has been proven valid and infringed such that $\Theta = 1$.

42. While, in practice, courts typically announce reasonable royalty awards as a percentage royalty on the total price of the accused product, the most logical way to calculate a reasonable royalty award is to first consider the value added by the patented component and then divide that value between the patentee and the infringer. For example, assume that the margin that can be earned on the sale of a complex product is \$50 and that the value added to the product by the patented invention is \$5, such that if the product were sold without the invention the margin would only be \$45. *See* Lemley & Shapiro, *supra* note 18, at 2021 (explaining a similar example). Since a reasonable royalty is principally based on the *ex ante* license that the parties would have struck before infringement, the royalty is given by the negotiated division of the \$5 surplus created by the invention. With equal bargaining power, for example, the parties would divide this surplus in half. The resulting reasonable royalty would then be \$2.50. Assuming that the total price (margin plus costs) of the complex product is \$150, the royalty could be equivalently stated as a 1.667 percent royalty on the price of the accused product. For a similar non-numerical example, see BLAIR & COTTER, *supra* note 12, at 215-17. For a more technical exploration of calculating reasonable royalty awards, 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).

2. *Deriving a benchmark royalty level for an entire complex device*

Building upon the Lemley-Shapiro benchmark model, we can demonstrate mathematically when application of the entire market value rule makes economic sense. This Part proves that a reasonable royalty award based on the margin M of the entire product less the value A of the next best alternative to the entire product⁴³ is the proper benchmark measure of damages under the rule, and that such an award only makes sense when the patent at issue truly accounts for the entire value of the accused product to the infringing firm. This analysis further demonstrates that for the entire market value rule to be applied at the benchmark level two conditions must be satisfied: (i) all unpatented components of the accused device must have zero value independent of the infringing component, and (ii) the patented invention itself must not have a reasonable alternative.

Application of the entire market value rule to award patent infringement damages based on an entire product is equivalent to awarding damages for infringement of a hypothetical patent covering the entire product.⁴⁴ Thus, when a reasonable royalty measure of damages is awarded based on an entire complex device, the resulting benchmark royalty under the Lemley-Shapiro model is $B \cdot V_{EMVR}$, where V_{EMVR} is the value per unit to the infringing firm of a hypothetical patent covering the entire accused device. Specifically, V_{EMVR} is the total value of the entire device to the infringer—i.e., the margin (M) earned on each unit—less the value of the next best alternative (A). Thus,

$$B \cdot V_{EMVR} = B \cdot (M - A) \quad [(2)]$$

This makes sense because, when a patent covers an entire device (or equivalently when a patented component truly accounts for the entire consumer demand for a complex product), the infringer will not be able to realize any value from the accused product without the patented subject matter. As a result, in reconstructing the bargain that the parties would have struck at the time of infringement, the infringer would be willing to pay a royalty amount up to the total value added by the patent.

Next, because we can view a royalty payment for a license to use a complex device as a summation of royalties paid to license each individual component of that device,⁴⁵ we can see that V_{EMVR} is also given by the summation of the total value per unit (or margin per unit) to the infringing firm

43. The next best alternative *to the entire product* should not be confused with the next best alternative *to the patented invention*, which, as we shall see *infra* at Part II.A.3, cannot exist when the entire market value rule is applied in an economically sound manner.

44. *Cf.* Landers, *supra* note 3, at 362.

45. This makes sense because, intuitively, the value of a complex device is a linear combination of the values of its component parts.

of each component of the entire infringing product (m_i) less the next best noninfringing alternative for each component (a_i) such that, where N is the total number of components of which the accused device is comprised,

$$B*V_{EMVR} = B*(M - A) = B* \sum_{i=1}^N (m_i - a_i) \quad [(3)]$$

Since we know from the Lemley-Shapiro formulation that by definition the total value of each component less the value of its next best alternative equals the value (v_i) of that component to the infringing firm, V_{EMVR} is also given by the summation of the values per unit to the infringing firm of each component of the entire infringing product such that

$$B*V_{EMVR} = B* \sum_{i=1}^N (m_i - a_i) = B* \sum_{i=1}^N v_i \quad [(4)]$$

Thus, we can see that the benchmark royalty for an entire complex product is given by the negotiated division of the margin per unit less the next best alternative for the product or, equivalently, the summation of the values to the infringing firm of each component of the infringing device. Substituting in the value of the patent at issue (v_p) for the value of the hypothetical all-encompassing patent (V_{EMVR}) we get

$$B*v_p = B*(M - A) = B* \sum_{i=1}^N v_i \quad [(5)]$$

Therefore, when the entire market value rule is applied to award reasonable royalty damages based on an entire accused device including an infringing component, the benchmark royalty will only be achieved if the infringing component accounts for the entire value of the accused product to the infringing firm across all components, such that the patent accounts for the entire margin per unit of the accused device above the value of its next best alternative. This result confirms the economic rationale behind the creation of the entire market value rule—namely, that when 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.⁴⁶ In other words, this analysis confirms that application of the

46. Thus, when applied in an economically rational manner, the entire market value rule comes into play only when the value added by the patented invention equals the total margin earned on the sale of the accused product. *Accord* BLAIR & COTTER, *supra* note 12, at 216-17. For example, assume that the value added to an accused complex product by a patented invention is \$50, which also equals the total margin earned on the sale of the entire product. In this case, the infringer cannot sell the product without including the invention. As a result, we would expect the patentee and infringer to negotiate a license dividing the entire \$50 margin. With equal bargaining power, for example, the parties would split the margin. In

doctrine makes sense only when the value of the patented component drives the sale of the entire infringing product.

3. *Two conditions for benchmark level compensation*

This economic model also shows that the existence of two conditions (which are generally readily provable by various means discussed below in Part IV) can help determine whether or not the doctrine may be applied in a given case without overcompensation. First, we can see that when the entire market value rule is applied at the benchmark level—i.e., when the patented component accounts for the entire value to the infringing firm of the entire product—no other component of the product can have any independent value.⁴⁷ The model shows that the benchmark is only achieved when $v_i = 0$ for all unpatented components ($i \neq p$), such that

$$B^*v_p = B^* \sum_{i=1}^N v_i = \sum [\dots 0, 0, 0, v_p, 0, 0, \dots] \quad [(6)]$$

As a result, application of the entire market value rule will result in overcompensation if even one unpatented component of the accused device can be shown to have independent economic value above its next best alternative. If any components of the product have independent value, v_p must be less than the value of the accused device to the infringing firm ($M - A$),⁴⁸ and, as a result, the patentee will be overcompensated by a damages award based on the entire value of the accused product.

Second, given that no other components may have independent value to the infringer when the doctrine is applied at the benchmark level,⁴⁹ it follows that the patented component cannot have a reasonable alternative that could readily be combined with the remaining unpatented components of the accused device to create a “new” next best alternative. If such an alternative did exist, the unpatented components would have independent value because they could be used in combination with the substitute invention. Thus, if the patented

that case, the resulting reasonable royalty amount would be \$25 per unit.

47. The Federal Circuit has recognized this result in a number of cases. *See* *Kori Corp. v. Wilco Marsh Buggies & Draglines, Inc.*, 761 F.2d 649, 656 (Fed. Cir. 1985) (holding that the entire market value rule is properly applied when the unpatented features cannot be sold or used without the patented feature); *see also* *State Indus., Inc. v. Mor-Flo Indus., Inc.*, 883 F.2d 1573, 1580 (Fed. Cir. 1989). *But cf.* *Juicy Whip, Inc. v. Orange Bang, Inc.*, 382 F.3d 1367, 1372 (Fed. Cir. 2004) (applying the entire market value rule to allow damages based on sales of syrup used in a patented juice dispenser even though “other dispensers could use Juicy Whip’s syrups”). However, it has never been used to overturn or rebut an entire market value rule damages claim.

48. *See* Equation (2) *supra*.

49. *See* Equation (6) *supra*.

invention has even one such reasonable alternative, application of the entire market value rule will result in overcompensation.

In combination, these conditions will rarely be satisfied. However, entire market value rule case law shows that the Federal Circuit nonetheless routinely affirms damages awards granted under the doctrine despite clear evidence that unpatented components have independent value or that reasonable alternatives exist for the patented invention.

Several cases demonstrate that courts are willing to invoke the entire market value rule when unpatented components of the accused device have independent economic value. In *Juicy Whip, Inc. v. Orange Bang, Inc.*, for example, the Federal Circuit ruled that the patentee could move forward on an entire market value rule theory of damages to recover for lost sales of unpatented syrup used in conjunction with a patented juice dispenser despite the fact that “other dispensers could use Juicy Whip’s syrups.”⁵⁰ The court thus approved application of the doctrine even though the unpatented syrups could be sold apart from the patented invention for use in alternative dispensers. Similarly, in *Paper Converting Machine*, the Federal Circuit affirmed a damages award based on a whole line of paper-winding products including unpatented auxiliary equipment despite the fact that the auxiliary devices were not “integral parts” of the winder line and in fact “each [had] separate usage.”⁵¹ Again, the court approved application of the doctrine even though the unpatented equipment could have been independently sold for use in other paper-winding lines.

Other cases demonstrate that courts are willing to award damages under the entire market value rule when the patented component has a reasonable alternative. In *State Industries, Inc. v. Mor-Flo Industries, Inc.*, for example, the Federal Circuit affirmed an award of damages based on an entire insulated water heating system, which was comprised of unpatented water heaters sold along with patented foam insulation, despite the fact that other forms of insulation such as fiberglass were available.⁵² Similarly, in *Tec Air, Inc. v. Denso Manufacturing Michigan, Inc.*, the Federal Circuit affirmed a jury’s damages award based on entire radiator and condenser assemblies sold along with cooling fans balanced according to a patented method despite the fact that the defendant continued to sell assemblies successfully after abandoning the patented balancing method with only a single customer complaint.⁵³

50. 382 F.3d at 1372.

51. *Paper Converting Mach. Co. v. Magna-Graphics Corp.*, 745 F.2d 11, 23 (Fed. Cir. 1984).

52. 883 F.2d 1573, 1579-80 (Fed. Cir. 1989).

53. 192 F.3d 1353, 1362 (Fed. Cir. 1999).

4. *Measuring patentee overcompensation*

The economic model described above demonstrates that, to the extent that a patent does not account for the entire value of the accused product to the infringer less its next best alternative, application of the entire market value rule will only serve to overcompensate the patentee by awarding it damages covering value its invention did not create. Using the economic model, we can easily measure the magnitude of this overcompensation when it occurs. From Equations (2) and (4), we know that when the entire market value rule is applied the patentee is compensated by the amount

$$B^*(M - A) = B^* \sum_{i=1}^N v_i \quad [(7)]$$

Subtracting the benchmark royalty (B^*v_p) from this sum, we are left with the amount of compensation awarded to the patentee above the benchmark level. Thus, the model shows that when damages are awarded under the doctrine that exceed the benchmark royalty, the patentee is overcompensated by the amount

$$B^*(M - A - v_p) = B^* \sum_{i \neq p} v_i^{54} \quad [(8)]$$

B. *Consequences of Patentee Overcompensation*

Many socially undesirable effects result when patentees are overcompensated for their inventive contributions. These effects include diminished incentive for investment in potentially infringing activities and increased incentive for patentees to engage in patent trolling. When they arise in the context of the entire market value rule, these effects become even more problematic.

1. *Decreased incentive for investment in beneficial activities*

Allowing patentees to recover damages in excess of the value added by their patented inventions skews the patent system's balance between encouraging invention and discouraging potentially infringing commercial activity. When the entire market value rule is invoked to permit recovery for the entire value of an infringing product but the patented feature accounts for only a portion of that value, the patentee's rights have effectively been

54. Subtracting the benchmark royalty, B^*v_p , from (2) we get: $B^*(M - A) - B^*v_p = B^*(M - A - v_p)$. Subtracting from (4) we get: $B^* \sum_{i=1}^N v_i - B^*v_p = B^* \sum_{i \neq p} v_i$.

expanded beyond the “metes and bounds” of the claim language. Thus, as emphasized above, overcompensation is equivalent to overexpansion of patent rights.⁵⁵

When patentees are compensated for more than their invention is worth—whether the overcompensation results from damage awards or expanded patent rights—there is a corresponding disincentive for potential infringers to engage in beneficial⁵⁶ commercial activity.⁵⁷ A higher level of expected infringement liability effectively raises the potential infringer’s marginal cost, which in turn raises the price of the infringer’s products and reduces its level of output. The result is a deadweight economic loss to society. If the disincentive is large enough, the potential infringer may be forced to abandon totally what would otherwise be efficiency-enhancing behavior.⁵⁸

In the context of the entire market value rule, the overcompensation of patentees creates a disincentive for the production of complex products.⁵⁹ This

55. See *supra* notes 43-44; see also *The Patent Reform Act of 2007: Hearing on H.R. 1908 Before the Subcomm. on Courts, the Internet, and Intellectual Prop. of the H. Comm. on the Judiciary*, 110th Cong. (Lexis 2007) (statement of John R. Thomas, Professor of Law, Georgetown Univ. Law Center) (“[W]hen the Entire Market Value Rule effectively becomes the default damages principle, rather than one that applies under only particular circumstances, the actual scope of patent protection may greatly exceed the claim scope that has been sought and obtained.”); Eric E. Bensen, *Understanding the Federal Circuit on Patent Damages for Unpatented Spare Parts*, 12 FED. CIR. B.J. 57, 65 (2002) (“The most notable expansion of the patent monopoly is the Entire Market Value Rule.”).

56. While developing and producing a product that might infringe a patent, an infringer may, in the process, discover new innovative features. As a result, when potential infringers engage in inventive activity (rather than leaving the market) the result will be more innovation overall. See Robert P. Merges & Richard R. Nelson, *On the Complex Economics of Patent Scope*, 90 COLUM. L. REV. 839, 843-44 (1990) (“[Patent] law should attempt at the margin to favor a competitive environment for improvements, rather than an environment dominated by the pioneer firm . . . [because] the efficiency gains from the pioneer’s ability to coordinate are likely to be outweighed by the loss of competition for improvements to the basic invention.”).

57. See Marina Lao, *Unilateral Refusals to Sell or License Intellectual Property and the Antitrust Duty to Deal*, 9 CORNELL J.L. & PUB. POL’Y 193, 214 (1999) (“If the system overcompensates the inventor, the protection may actually impede innovation by denying competitors (and users) access to needed information and basic inventions that could serve as building blocks for further progress. In short, because competition also plays a role in fostering innovation, overprotection of a patent holder from competition may perversely result in less, rather than more, innovation.”).

58. A rational producer will cease to produce a potentially infringing product if the expected cost of patent liability increases to exceed the otherwise expected margin on sales of the product. See, e.g., Jerry R. Green & Suzanne Scotchmer, *On the Division of Profit in Sequential Innovation*, 26 RAND J. ECON. 1, 26-27 (1995) (noting that the specter of patent infringement liability may cause future innovators to avoid a market for fear that expected patent licenses will reduce profitability).

59. See *The Patent Reform Act of 2007*, *supra* note 55 (“Modern products and processes commonly embody numerous patented inventions, with some incorporating on the order of one thousand or more. Overly generous damages awards with respect to just a fraction of these patents may impose infringement liability upon manufacturers that dramatically exceeds the profits the infringer made. Such an outcome fails to recognize that

result is particularly troubling because in our modern technology-centered society, a large proportion of the most socially beneficial products are complex devices which may be composed of hundreds or thousands of components. As Allison and Lemley have noted, “[W]e are in an era of astounding productivity attributable to technological innovation,” particularly due to rapid growth in industries characterized by technological complexity such as computing, telecommunications, and biotechnology.⁶⁰ The entire market value rule’s inherent overcompensation of patentees thus serves to deter further investment and innovation in these vital areas.

2. *Royalty stacking*

In its current form, the entire market value rule also exacerbates the effects of “royalty stacking.”⁶¹ This problem arises from the fact that a complex product constructed from many components may be covered by a number of patents owned by an equally large number of patentees. As a result, the producer of such a product may infringe multiple patents and therefore be required to pay for multiple licenses. To the extent that patent damages rules allow for the overcompensation of patentees, the infringer faces the prospect of paying overlapping royalties.

Royalty stacking in the entire market value rule context can be particularly egregious. For example, if a producer of a complex product has already been compelled to pay a reasonable royalty to a patentee based on the entire value of the complex product, the producer has effectively compensated the patentee for the value contributed by each and every component of that product.⁶² Suppose that the same producer is subsequently sued for patent infringement by another patentee claiming that its invention covers an additional feature of the complex product. Legally, nothing prevents the second patentee from proceeding with this infringement claim despite the fact that a court has previously ruled that the first patent accounts for the entire value of the accused product.⁶³ Any

the patent system serves not just to promote innovation, but also to encourage the dissemination of new products and processes to the marketplace.”).

60. Allison & Lemley, *supra* note 2, at 78, 80.

61. For a detailed analysis of royalty stacking see Lemley & Shapiro, *supra* note 18.

62. Recall from *supra* Part II.A that according to Equation (4) $B \cdot V_{EMVR} = B \cdot \sum_{i=1}^N v_i$.

Dividing each side by the variable B, we are left with $V_{EMVR} = \sum_{i=1}^N v_i$.

63. It is not a total solution to this problem to simply preclude further liability after the entire market value rule has been successfully applied to a device. To the extent that the second patentee in this hypothetical has a legitimate claim for patent infringement, but is prevented from recovery because of the earlier award (by, for example, a change in the law),

additional liability faced by the producer is necessarily duplicative of that already paid to the patentee who first filed suit.⁶⁴ Thus, application of the entire market value rule in situations when the patented invention does not account for the entire value of the accused product (and the remaining components of the product are not clearly in the public domain) leaves the producer to face the prospect of further, duplicative liability down the road.

3. Increased incentive for patent trolling

The overvaluation of patents also has the undesirable consequence of increasing incentives for firms to engage in “patent trolling.” In recent years, the acquisition of patents for the sole purpose of obtaining license fees and awards from infringement litigation—rather than for use in the design, manufacture, or distribution of products—has been an increasingly common business plan.⁶⁵ 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.⁶⁶

While it may be premature to totally denounce this increased reliance on patents as “revenue-generating devices,”⁶⁷ many are concerned that patent trolling has a detrimental effect on innovation in general.⁶⁸ At the very least,

the patent system effectively only redistributes patent value to patentees who bring suit quickly. Furthermore, even in the absence of an additional infringement claim, an erroneous application of the entire market value rule will harm a defendant who owns a second patent on the accused device or who made unpatentable contributions to the device’s value. *See Patent Reform Act of 2007, supra* note 55 (“Failure to apportion damages may cause a patent effectively to cover contributions that lie within the public domain, as well as technology that has been patented by third parties or even by the infringer.”); Landers, *supra* note 37, at 255 (noting that under current law a patentee can capture substantial value created by the infringer’s efforts, including “the popularity of a product that is due to the infringer’s advertising, development of a market, superior consumer support, the infringer’s name or development of marketing and distribution channels”).

64. As introduced *supra* note 16, the Supreme Court long ago recognized this possibility in *Seymour v. McCormick*, 57 U.S. 480, 490 (1853) (explaining that without apportionment, “the unfortunate mechanic [who sells a complex device] may be compelled to pay treble his whole profits to each of a dozen or more several inventors of some small improvement in the [device] he has built.”).

65. *See* Landers, *supra* note 3.

66. *See, e.g.,* Toshiko Takenaka, *Patent Infringement Damages in Japan and the United States: Will Increased Patent Infringement Damage Awards Revive the Japanese Economy?*, 2 WASH. U. J.L. & POL’Y 309, 365 (2000) (noting that an increase in the size of patent infringement damage awards may encourage firms to engage in inefficient litigation).

67. Landers, *supra* note 3, at 345.

68. *See, e.g.,* Gary L. Reback, *Patently Absurd*, FORBES ASAP, June 24, 2002, at 44 (criticizing the use of patents for generating royalties rather than the creation of “revenue-generating products”); Erica Werner, *Lawmakers Want “Patent Troll” Crackdown*, USA TODAY, June 9, 2005, http://www.usatoday.com/tech/news/techpolicy/2005-06-09-patent-troll_x.htm? POE=TECISVA (“The broken patent system right now, and the rise in lawsuits,

however, as firms move toward increased efforts at licensing, they move away from increased investment in commercialization and further invention.

4. *Overvaluation as a patent infringement deterrent*

Further, these negative consequences are not outweighed by any beneficial deterrent effects that patentee overcompensation might have on potential infringers. While the goal of patent infringement damages is to compensate patentees for losses sustained as a result of infringement and not to punish or deter infringers,⁶⁹ inflated damages awards do have at least some potential to benefit the patent system as a hidden means to deter patent infringement and thereby reduce the amount of resulting litigation.⁷⁰ If infringers face no more than a true reasonable royalty (the license that the companies would have agreed to prior to infringement) following a patent infringement suit, infringers will have a strong incentive to eschew *ex ante* licensing in favor of stealing the patentee's technology and forcing litigation, the expected cost of which will be an *ex post* payout that is less than or equal to the amount that the companies would have agreed to prior to infringement.⁷¹ In other words, if prospective damages match *ex ante* license royalties, an infringer has (litigation costs aside) nothing to lose and everything to gain by forcing litigation. Thus, inflating damages above the true reasonable royalty level gives infringers an incentive to license rather than litigate.

There are, however, many reasons to believe that there are no substantial deterrence-related benefits to be found in the overcompensation of patentees through excessive reasonable royalty or entire market value rule awards. Namely, the willfulness doctrine serves to deter the type of conduct described above.⁷² Under the willfulness doctrine, courts may award up to three times the plaintiff's actual damages if the infringer willfully infringed the patent at issue.⁷³ Thus, unscrupulous companies that steal the technology of another already face the possibility of stiff punishment. Furthermore, it makes no sense to deter nonwillful infringers who innocently and independently duplicated the work of the patentee.⁷⁴ In particular, there is no reason to think that

has unfortunately discouraged our companies from innovating, and patent trolls are gaming the system." (quoting Josh Ackil, Vice President of Government Relations, Information Technology Industry Council)).

69. See 35 U.S.C. § 284 (2000) (authorizing courts to award "damages adequate to compensate for the infringement, but in no event less than a reasonable royalty"); see also Lemley & Shapiro, *supra* note 18, at 2044.

70. See Landers, *supra* note 3, at 335-40.

71. *Id.* at 337-38.

72. See Lemley & Shapiro, *supra* note 18, at 2037.

73. See 35 U.S.C. § 284 (2000); BLAIR & COTTER, *supra* note 12, at 12.

74. See Landers, *supra* note 3, at 342 ("[A] deterrence premium should be limited to circumstances where the infringer should have actually known about the potential for infringement, as an innocent infringer by definition will not be deterred unless there is some

overapplication of the entire market value rule is an effective tool for deterring willful infringement because companies that develop complex products with hundreds or thousands of components are the least likely to discover *ex ante* that they may have innocently infringed an unknown patent.⁷⁵

C. Predictability and Ease of Administration

Adding to their overcompensating effect, damages awards granted under the entire market value rule are also exceptionally difficult to challenge on appeal. As with any patent infringement damages determination, application of the entire market value rule is ultimately a question of fact for the jury.⁷⁶ As a result, the Federal Circuit's hands are procedurally bound when considering entire market value rule awards entered by lower courts because the Federal Circuit must affirm these awards unless they are clearly erroneous. Accordingly, many of the Federal Circuit's most expansive rulings on the entire market value rule can likely be explained (at least in part) as cases in which the court felt that it had no choice but to affirm a highly questionable award based on the procedural posture of the challenge.⁷⁷

Thus, in addition to reducing the overvaluation of patents, returning the doctrine to its original role as a special case of the apportionment requirement has the added benefit of making erroneous applications of the doctrine easy to spot on appeal, thereby further reducing overcompensation of patentees by lower courts or juries that overlook or misunderstand the economics of the doctrine. If the doctrine were modified so that it were only to apply if the

reason to think it is infringing.”); Takenaka, *supra* note 66, at 364 (“[I]f the overcompensation scheme is justified by the policy of deterrence, the applicability of the new provision must be limited to those who willfully infringed patents.”).

75. See Landers, *supra* note 3, at 341 (noting that companies that produce complex products or that develop technologies surrounded by “patent thickets” may find it “difficult, if not impossible” to assess whether new products may infringe existing patents).

76. See SmithKline Diagnostics, Inc. v. Helena Labs. Corp., 926 F.2d 1161, 1164 (Fed. Cir. 1991) (“[T]he amount of a prevailing party’s damages is a finding of fact on which the plaintiff bears the burden of proof by a preponderance of the evidence. Thus, where the amount is fixed by the court, review is in accordance with the clearly erroneous standard . . .”).

77. The Federal Circuit has affirmed numerous entire market value rule damages awards based on what can only be described as tenuous evidence relating to the basis of consumer demand for the accused product. See, e.g., Tec Air, Inc. v. Denso Mfg. Mich., Inc., 192 F.3d 1353, 1362 (Fed. Cir. 1999) (affirming entire market value rule damages award based on statements from defendant’s internal documents that “the performance and price of the *entire system* were paramount to its customers” and a single complaint from a customer following defendant’s abandonment of the patented method); Fonar Corp. v. Gen. Elec. Co., 107 F.3d 1543, 1552-53 (Fed. Cir. 1997) (affirming the entire market value rule damages award based solely on the fact that the defendant’s “technical literature of record emphasized the [patented] feature”). The evidence in these cases nonetheless provided just enough support to create a *not clearly erroneous* basis for the jury’s decision to apply the entire market value rule.

patented component indeed accounted for the entire market demand for the accused device, a reviewing court could readily overturn awards in cases where a reasonable juror could not have found that the patented component had no reasonable alternatives or that all other components lacked independent value to the infringer.⁷⁸ This result would not only cut down on questionable applications of the doctrine by lower courts, but would also make its application more objective and predictable.

III. THE ENTIRE MARKET VALUE RULE AND COMPLEX ELECTRONIC DEVICES: A CASE STUDY OF PERSONAL COMPUTER SYSTEMS

Because the entire market value rule's potential impact in patent litigation is directly related to the level of complexity in the pool of accused devices, the doctrine's influence will be particularly strong in future patent litigation involving complex electronic devices such as digital cameras, wireless devices, and computer systems. This Part applies existing entire market value rule case law to a hypothetical infringing personal computer system (PC) and shows that the doctrine is particularly ill-suited for application in the current technological environment characterized by a high density of common, yet extraordinarily complex, products. It concludes that a return to original entire market value rule precedent would likely foreclose the lion's share of the doctrine's overapplication in this vital sector of the economy.

A. *Complex Electronic Devices Under Current Entire Market Value Rule Case Law*

Under current case law, a patentee faces two obstacles in proving that the entire market value rule should be applied. First, the patentee must show that any unpatented items in its proposed compensation base are either physically connected to the infringing component or operate as part of a functional unit with the infringing component.⁷⁹ Second, the patentee must show that at least some threshold amount of market demand for the infringing functional unit is properly attributable to the patented invention or that the patentee could reasonably foresee making sales of the unpatented elements of the functional unit along with the infringing component.⁸⁰

78. See *supra* Part II.A.3 for the derivation of these two conditions of benchmark level of recovery.

79. See *Rite-Hite Corp. v. Kelley Co.*, 56 F.3d 1538, 1550 (Fed. Cir. 1995).

80. See *State Indus., Inc. v. Mor-Flo Indus., Inc.*, 883 F.2d 1573, 1580 (Fed. Cir. 1989) (stressing whether "the patent related feature is the *basis for consumer demand*" (emphasis added)); *Paper Converting Mach. Co. v. Magna-Graphics Corp.*, 745 F.2d 11, 23 (Fed. Cir. 1984) (stressing whether "the patentee (or its licensee) can *anticipate sale of such unpatented components*" (emphasis added) (quoting *Tektronix, Inc. v. United States*, 552 F.2d 343, 351 (Ct. Cl. 1977))).

The analysis that follows explores the entire market value rule's application in a hypothetical patent infringement suit in which a computer manufacturer is accused of infringing a patent covering a single component of the microprocessor sold as part of a larger PC system.⁸¹ A PC offers a particularly illustrative example because it is comprised of a uniquely diverse set of components that interconnect in a number of different ways. Generally speaking, PCs are composed of physically connected components—i.e., internal components located inside the computer tower (or equivalent casing) including microprocessor chips, a motherboard, and the like—as well as an endless assortment of peripheral products such as monitors, keyboards, mice, printers, and scanners.

1. *The functional unit test under Rite-Hite and Juicy Whip*

To obtain damages based on an entire bundled PC system, the patentee will first need to establish which components of the PC are part of a functional unit including the accused microprocessor component. In *Rite-Hite*, the Federal Circuit held that the entire market value rule may be applied to award damages based on unpatented components that function together with the patented invention, but not based on items sold along with the infringing product merely for “convenience or business advantage.”⁸² The court ruled that a patented truck restraint and unpatented dock leveler did not constitute a functional unit even though the two products were sold together by both the patentee and the accused infringer.⁸³ The court found that although the products “may have been used together, they did not function together to achieve one result and each could effectively have been used independently of each other.”⁸⁴ The court attributed the fact that customers frequently ordered both products

81. This hypothetical is inspired in part by Forgent Network's recent efforts to enforce U.S. Patent No. 4,698,672—a patent that it claims covers the ubiquitous JPEG image compression format—against dozens of companies that produce products or services related to digital cameras, scanners, personal computers, and other devices utilizing the JPEG standard. Forgent's assertion of its alleged patent rights resulted in over \$110 million in licensing revenue. Press Release, Forgent Networks, Forgent Announces '672 Patent Settlement (Nov. 1, 2006), available at <http://phx.corporate-ir.net/phoenix.zhtml?c=75983&p=irol-newsArticle&ID=925001&highlight=>, before the PTO granted the Public Patent Foundation's request for reexamination and subsequently invalidated the patent's broadest claims, see Public Patent Foundation: Forgent JPEG Related Patent, <http://www.pubpat.org/forgentjpeg.htm> (last visited Mar. 1, 2007) (linking to the PTO's grant of Public Patent Foundation's request for reexamination and the office action rejecting the patent's broadest claims). In November 2006, Forgent announced that it would surrender all pending infringement claims and no longer seek to assert the patent. Press Release, Forgent Networks, *supra*; Press Release, Public Patent Found., JPEG Patent Claim Surrendered (Nov. 2, 2006), available at <http://www.pubpat.org/jpegsurrendered.htm>.

82. *Rite-Hite*, 56 F.3d at 1550.

83. *Id.* at 1551.

84. *Id.*

simultaneously to a preference for ease in “contracting and construction scheduling” and to “combination discounts” offered by the sellers, rather than to any mutual, functional relationship.⁸⁵

However, a functional relationship “is not precluded by the fact that the [patented] device can be used with other materials or that the unpatented material can be used with other devices.”⁸⁶ In *Juicy Whip*, the Federal Circuit vacated a jury award and remanded for further proceedings because the district court failed to find a functional relationship between a patented juice dispenser and unpatented syrup used in the dispenser.⁸⁷ Despite the fact that “the dispenser had been sold separately from the syrup on occasion” and that “other syrups could be used in Juicy Whip’s dispenser,” the court found the two products to be “analogous to parts of a single assembly or a complete machine,” functioning together to create the visual appearance of mixing central to the patented invention.⁸⁸

Thus, under *Rite-Hite*, at a minimum any computer components physically connected to the accused chip would be fair game under the entire market value rule. This would draw the entire contents of the PC tower within the ambit of recovery. In fact, because *Rite-Hite*’s functional unit test allows the entire market value rule to apply to components that are not physically connected to the infringing component,⁸⁹ and because, according to *Juicy Whip*, components may be included in the compensation base despite having independent uses and value,⁹⁰ there is seemingly very little that we can say with certainty would be excluded. Under existing case law, it is hard to argue that keyboards, monitors, mice, and even printers, scanners, speakers, software, or external memory sources cannot be considered part of the functional unit that we call a PC.

Thus, while one can conceive of products that if bundled together with a PC would not be rightfully considered part of a functional unit with the computer (perhaps a promotional hat or coffee mug bearing the manufacturer’s logo), all internal computer components and virtually any common peripheral

85. *Id.*

86. *Juicy Whip, Inc. v. Orange Bang, Inc.*, 382 F.3d 1367, 1372 (Fed. Cir. 2004).

87. *Id.* at 1372.

88. *Id.*

89. *See, e.g., Rite-Hite*, 56 F.3d at 1550 (“The [entire market value rule] has been extended to allow inclusion of physically separate unpatented components normally sold with the patented components.”).

90. *Juicy Whip*, 382 F.3d at 1372 (finding that district court erred by denying patentee the opportunity to present evidence on an entire market value rule theory including damages for syrups that could be used in juice dispensers other than the accused device, and thus had independent commercial value). Note that by allowing such a result *Juicy Whip* directly contradicts one of the conditions of benchmark-level application of the entire market value rule. As discussed *supra* in Part II.A.3, if an unpatented component has independent value, the patented invention cannot account for the entire value of the product to the infringing firm. As a result, application of the entire market value rule will overcompensate the patentee by at least the magnitude of that value.

devices imaginable are likely fair game despite the fact that each may have independent uses and substantial independent value.

2. Consumer demand and anticipation of sales

Once the patentee has shown which components may be included in the compensation base, it only bears the burden of showing that the patented invention accounts for a sufficient amount of consumer demand for the accused functional unit or, alternatively (and more commonly in recent cases), that it could reasonably anticipate sales of the unpatented components of the functional unit.

When attempting to show sufficient consumer demand, patentees benefit from the fact that the standard in the case law for meeting this requirement has not been nearly as stringent as the name of the doctrine might suggest. In recent cases, showing sufficient consumer demand for the patented feature has primarily been based on: (i) evidence of consumer preference for that feature or its resulting benefits;⁹¹ (ii) expert testimony indicating that the feature improved the remainder of the entire machine in a significant way;⁹² or (iii) evidence indicating that the defendant recognized the value of the feature and attempted to market its products based on the benefits of the feature.⁹³ In *Tec Air*, for example, the Federal Circuit upheld the application of the entire market value rule for patented fans included in radiator and condenser assemblies based on evidence showing that “customers wanted fans that were balanced” like those produced by the patentee, and that after the infringer abandoned use of the patented fan “one customer complained and required [the infringer] to rebalance the fans.”⁹⁴ Similarly, in *Lucent Technologies, Inc. v. Newbridge Networks Corp.*, the court rejected the infringer’s request for a new trial on damages when testimony by the patentee’s technical manager indicated that a previous, informal survey of customers showed that the patented feature was “‘a requirement’ that customers insist upon.”⁹⁵ Likewise, in *Fonar Corp. v. General Electric Co.*, the Federal Circuit upheld a damages award based on an entire MRI machine when the infringer’s technical literature and brochure emphasized the inclusion of the patented feature.⁹⁶

Even if a patentee cannot show a sufficient amount of consumer demand, it can still show that it could reasonably anticipate sales of the unpatented elements of the infringing functional unit. In practice, anticipation of sales has

91. See, e.g., *Bose Corp. v. JBL, Inc.*, 274 F.3d 1354, 1361 (Fed. Cir. 2001); *Tec Air, Inc. v. Denso Mfg. Mich. Inc.*, 192 F.3d 1353, 1362 (Fed. Cir. 1999).

92. See, e.g., *Bose*, 274 F.3d at 1361.

93. See, e.g., *id.*; *Fonar Corp. v. Gen. Elec. Co.*, 107 F.3d 1543, 1552-53 (Fed. Cir. 1997).

94. 192 F.3d at 1362.

95. 168 F. Supp. 2d 181, 262-63 (D. Del. 2001).

96. 107 F.3d at 1552-53.

been proven by demonstrating that most purchasers of the patentee's invention purchased the unpatented accessories or additional parts along with the invention in a single package.⁹⁷ In *Paper Converting Machine*, the Federal Circuit affirmed an award of damages including compensation based on the sale of unpatented "auxiliary equipment" along with a patented rewinder mechanism for the manufacture of paper rolls.⁹⁸ Despite acknowledging that "[n]one of the auxiliary units here are integral parts of the rewinder; rather, they each have separate usage," the court found the damage award to be appropriate because "[s]ubstantial evidence showed . . . that the entire industry routinely purchased a complete rewinder line from the seller of the rewinder machine."⁹⁹

While it may seem farfetched to suggest that a single microprocessor component could account for the entire value of a complete PC system—especially when a PC microprocessor alone may be covered by hundreds or thousands of patents in addition to the patent at issue¹⁰⁰—current doctrine makes the patentee's job relatively simple. The patentee need only rely on a few lines from the infringer's technical or marketing materials praising the patented feature.¹⁰¹ For example, the infringer need only have touted how fast, reliable, small, or energy efficient its microprocessors are for an award to be upheld by the Federal Circuit.

If such a statement is missing, the patentee can still recover based on the entire PC if it can show that sales of entire PC systems are reasonably foreseeable in conjunction with sales of microprocessor chips. In practice, the patentee need only show that customers traditionally purchase entire PC systems from the same source or that PCs are generally marketed as one total system.¹⁰² While perhaps not true a decade ago, it is now unquestionably the customary practice in the computer industry for customers to buy a whole PC system, including peripherals, from a single manufacturer. One need only visit the Dell, Gateway, or Apple websites to see that sales of computer chips are

97. See, e.g., *Paper Converting Mach. Co. v. Magna-Graphics Corp.*, 745 F.2d 11, 23 (Fed. Cir. 1984).

98. *Id.*

99. *Id.*

100. Landers, *supra* note 3, at 341 ("[S]oftware and computers are examples of 'system' products—they comprise thousands, even hundreds of thousands, of individually functioning components and features all assembled in a package for a customer. Because many of these features could be the subjects of a patent, it is often the case that thousands of patents may be relevant to a particular computer or software product." (quoting *Patent Quality Improvement, Hearing Before the Subcomm. on Courts, the Internet and Intellectual Prop. of the H. Comm. on the Judiciary*, 109th Cong. 52 (2005) (statement of Richard J. Lutton, Jr., Chief Patent Counsel, Apple Computer, Inc., on behalf of the Business Software Alliance)); see also Lemley & Shapiro, *supra* note 18, at 1992 ("[M]odern products such as microprocessors, cell phones, or memory devices can easily be covered by dozens or even hundreds of different patents.").

101. See, e.g., *Fonar*, 107 F.3d at 1552-53.

102. See, e.g., *Paper Converting Mach.*, 745 F.2d at 23.

generally bundled with the internal components and peripherals that comprise a traditional PC system.

B. Complex Electronic Devices Under a Modified Entire Market Value Rule

While this analysis demonstrates that the entire market value rule may be applied expansively in the area of complex electronic devices, returning the doctrine to its original role as a special case of the apportionment requirement would all but preclude its application in the arena of complex electronic devices. Recall that, as a matter of economics, a single patented component of a larger product cannot account for the entire value of that product unless the independent value of each unpatented component is zero and the patented component itself has no reasonable alternatives.¹⁰³ If the entire market value rule could not be applied without these conditions being satisfied, an infringement case like the above PC hypothetical would likely come out quite differently. Due to interoperability standards, essentially any computer peripheral could be used with any noninfringing PC system. As a result, at least some components of the PC system could be used apart from the patented chip component, and thus have independent economic value. Similarly, because the PC manufacturer could likely switch to another noninfringing chip without prohibitive cost, the patented invention also has at least some reasonable alternatives.

IV. POLICY RECOMMENDATIONS

Now that we have seen how the entire market value rule is routinely applied to reward patentees for value invented by others or present in the prior art, we look to see how the entire market value rule can be modified to limit its application to only those circumstances where the patented invention likely accounts for all of the accused product's value to society.¹⁰⁴ The economic

103. See *supra* Part II.A.2.

104. If adopted, currently pending legislation promises to offer some defense against the quiet expansion of the entire market value rule and patent infringement damages in general. Introduced in April 2007, the Patent Reform Act of 2007, H.R. 1908, 110th Cong., proposes to amend, among many other patent law provisions, section 284 by giving courts more direction in how to calculate patent infringement damages. Notably, the bill states that courts shall ensure that reasonable royalty damages are based “only [on] that economic value properly attributable to the patent’s specific contribution over the prior art,” and further “shall exclude from the analysis the economic value properly attributable to the prior art, and other features or improvements, whether or not themselves patented, that contribute economic value to the infringing product or process.” *Id.* § 5(b)(2). In addition, the proposed bill would codify a version of the entire market value rule under which a patentee could recover based on the entire value of the infringing complex product but only after showing that the infringing component is the “predominant basis for market demand.” *Id.* § 5(b)(3). While certainly a step in the right direction, these proposals offer an incomplete response to the expansion of the entire market value rule. In particular, the bill’s vague standard for

analysis presented above suggests that the entire market value rule should be altogether abandoned, or rather returned to its origin as a special case of the apportionment requirement, and thus that modern cases like *Rite-Hite* and *Juicy Whip* should be overturned. While this reform would be the most appropriate, this Part additionally introduces a number of simple reforms that, short of total abolition, can be adopted to help ensure that damages awards granted under the entire market value rule better approximate benchmark level compensation. Specifically, this Part suggests that at a minimum the entire market value rule should be modified so that an accused infringer may rebut a patentee's claim that the doctrine applies by showing either that there is a reasonable alternative to the patented invention or that at least one unpatented component of the infringing device has independent economic value. Such a framework would allow accused infringers to present crucial economic evidence that signals whether overcompensation is likely to result and thus casts doubt on a patentee's claims to the entire value of the infringing product.

A. Evidence of Alternative Technologies

A great deal of improper application of the entire market value rule could be prevented if accused infringers were permitted to offer evidence that the patented invention at issue had reasonable alternatives as a means to defend against the doctrine's application. As introduced above, a patented component cannot account for the entire market demand for a larger product if the component can be replaced with a reasonable alternative technology. If alternatives exist, the entire market value for the product is created, at best, by the genus of alternatives, and not by the specific species over which the patentee owns exclusive rights. Such a defense would be easy to implement because courts are already experienced in determining whether products have reasonable alternatives. In determining lost-profits damages for patent infringement, courts are often called upon to consider whether the existence of noninfringing substitutes for the accused invention should reduce the lost profits award.¹⁰⁵ Similarly, antitrust doctrine often calls on courts to define relevant markets and consider the effect of the substitutability on demand.¹⁰⁶

Returning to the PC hypothetical, this sort of reform would likely eliminate the patentee's hopes of recovering damages based on the entire PC. Suppose,

application of the entire market value rule—that the infringing component be the “predominant basis for market demand,” *id.*—while abandoning the most-expansive “anticipation of sales” formulation of the doctrine, leaves the door wide open for courts to continue to award excessive damages under the rule when the infringing component accounts for far less than the entire value of the accused product.

105. See, e.g., *Grain Processing Corp. v. Am. Maize-Prods. Co.*, 185 F.3d 1341, 1353 (Fed. Cir. 1999).

106. See, e.g., *United States v. E. I. du Pont de Nemours & Co.*, 351 U.S. 377, 393 (1956); DEP'T OF JUSTICE & FED. TRADE COMM'N, HORIZONTAL MERGER GUIDELINES §§ 1.0, 1.3, 3 (Rev'd ed. 1997).

for example, that the infringing invention was incorporated in chips manufactured by Intel but not in chips manufactured by AMD. In this situation, the accused PC manufacturer could switch to using AMD chips. While the popularity and usefulness of a PC does substantially derive from a small genus of inventions (namely the general concept of the transistor or the integrated circuit), it does not derive from any one specific type of chip. As a result, any invention not fundamental to all reasonably suitable chips could not possibly account for the entire market value of an entire computer system.

As a practical example, consider the recent patent litigation involving a patent purported to cover the popular JPEG image compression algorithm.¹⁰⁷ It is well known that other image compression algorithms exist and are readily available. Anyone familiar with a PC has likely encountered alternative digital image compression formats such as TIFF or GIF.¹⁰⁸ More importantly, new wavelet-based image compression algorithms such as JPEG 2000 exist that may even be superior to the popular JPEG algorithm.¹⁰⁹ Given that PC, camera, or other electronics manufacturers could reconfigure their devices to utilize other (perhaps even superior) image compression algorithms, the JPEG standard cannot account for the entire value of their products. While the general concept of image compression makes these products practical, the unpatented electronic components of any accused devices could be successfully used with other substitute compression algorithms.

107. See *supra* note 81 for further information on this litigation.

108. TIFF, or “Tagged Image File Format,” is an image compression standard first published in 1986 by Aldus Corporation. ADOBE DEVELOPERS ASS’N, TIFF REVISION 6.0 (1992), *available at* <http://partners.adobe.com/public/developer/en/tiff/TIFF6.pdf>. Like the JPEG standard, TIFF is a popular format for storing high color depth images and is commonly utilized by image-manipulation applications such as Adobe Photoshop. Tagged Image File Format, Wikipedia, http://en.wikipedia.org/wiki/Tagged_Image_File_Format (last visited Feb. 27, 2007). GIF, or “Graphics Interchange Format,” is an 8-bit per pixel bitmap format introduced in 1987 by CompuServe, Inc. See COMPUSERVE, INC., GRAPHICS INTERCHANGE FORMAT PROGRAMMING REFERENCE (1990), *available at* <http://www.w3.org/Graphics/GIF/spec-gif89a.txt>. Like JPEG, GIF is used widely on the World Wide Web. See Graphics Interchange Format, Wikipedia, <http://en.wikipedia.org/wiki/GIF> (last visited Mar. 1, 2007). Another common alternative image compression format is PNG (“Portable Network Graphics”). See Comparison of Graphics File Formats, Wikipedia, http://en.wikipedia.org/wiki/Comparison_of_graphics_file_formats (last visited Feb. 27, 2007).

109. JPEG 2000 was developed by the Joint Photographic Expert Group committee as a replacement for the original JPEG standard. See JPEG 2000, <http://www.jpeg.org/jpeg2000>; JPEG 2000, Wikipedia, http://en.wikipedia.org/wiki/JPEG_2000 (last visited Mar. 1, 2007). JPEG 2000 offers several advantages over the original JPEG standard, including higher compression ratios and sophisticated “progressive” downloads. *Id.*

B. Evidence of Consumer Demand

Moreover, accused infringers should be allowed to present evidence showing consumer demand for unpatented components of the accused product. As emphasized above, if the accused infringer can demonstrate independent market demand for these components, the entire market value rule cannot be applied without resulting in patentee overcompensation.

An easy way to show such demand is to allow the accused infringer to present evidence, when available, of royalties paid for licenses of patents covering other components of the accused device.¹¹⁰ While perhaps not dispositive, evidence that at least some other market participants found value in other inventions or components convincingly demonstrates that economic value exists in other parts of the product.

This sort of information would also help prevent royalty stacking. If the finder of fact is presented with evidence showing that the accused infringer licensed multiple patents in order to make the accused device or that other components of the accused device have previously been accused in prior patent litigation, awards of overlapping damages will in all likelihood be substantially reduced.

In addition, this sort of evidence may also help untie the hands of judges bound by the fact-based nature of this inquiry. If a jury awards damages under the entire market value rule for an entire accused product, and the producer of that product has previously paid out substantial infringement damages or licenses for the product, a court may very well be able to rule that no reasonable juror could have found that the patent at issue accounted for the entire market value.

Similarly, infringers should be allowed to present expert testimony regarding the sources of consumer demand for the accused product. While this practice might be expected to make trials longer and more costly, patent litigation is by its very nature a long and expensive process which already involves a great deal of expert testimony. The marginal cost in time and expense of allowing additional testimony with respect to component value would be insignificant compared to the overall cost of the case.

Another effective way to demonstrate consumer preferences is to question consumers about their decision to purchase the accused device. A survey of the accused infringer's customers could easily determine why those customers chose that particular product. Again, courts have considerable expertise in this sort of undertaking. In both trademark law and antitrust law, courts and juries are often called upon to evaluate and weigh the results of consumer surveys.¹¹¹

110. Lemley & Shapiro, *supra* note 18, at 2041 (suggesting the admission of such evidence is a general improvement to patent damages computation).

111. *See, e.g.*, *Scott Fetzer Co. v. House of Vacuums, Inc.*, 381 F.3d 477, 486-89 (5th Cir. 2004) (considering survey evidence with respect to likelihood of consumer confusion in trademark context); *United States v. Oracle Corp.*, 331 F. Supp. 2d 1098, 1147, 1168-69

At the very least, the entire market value rule should be modified to prevent patentees from recovering damages based on unpatented components that can reasonably be categorized as staple articles of commerce.¹¹² Such components clearly have commercial value independent of the patented feature because they may be readily bought and sold for noninfringing purposes. In the context of our infringing PC hypothetical, this requirement would likely exclude (at the least) all peripheral devices from the potential compensation base because, thanks to widespread standardization in the computer industry, they will almost certainly be interoperable with noninfringing computer systems.

CONCLUSION

The goal of patent policy should be to compensate patentees for their ingenuity, but not by more than is reasonably commensurate with the value created by their inventive contributions. While commentators have criticized the overcompensation inherent in the “reasonable royalty” measure of damages, the entire market value rule is a particularly egregious and noticeable offender. The economic model discussed in this Note demonstrates that the entire market value rule systematically overcompensates patentees who own patents covering only one component of a larger, complex device. As a result, the doctrine has become a means for patentees to capture value that they did not create, at the expense of innovative infringers, other patentees, and society at large.

The economic model discussed here suggests that patent reform measures must turn back the clock on the entire market value rule and return the doctrine to its rightful place as a special case of the apportionment requirement, rather than a broad exception to that rule. Until courts abandon current doctrine and apply the entire market value rule only when the patented component of the accused devices truly accounts for the entire market demand for the infringed device, patentees will continue to be unjustly rewarded. By making two simple reforms—allowing accused infringers to present evidence in defense against the doctrine’s application that (i) reasonable substitutes for the patented technology exist and (ii) unpatented components of the accused product have independent economic value—courts can go a long way toward eliminating this overcompensatory effect and, in the process, make the doctrine more coherent,

(N.D. Cal. 2004) (considering various types of introduced customer survey data in antitrust horizontal merger analysis); *see also* *Menasha Corp. v. News Am. Mktg. In-Store, Inc.*, 354 F.3d 661, 664-65 (7th Cir. 2004) (criticizing introduced survey data in antitrust market definition context).

112. Courts have long recognized the need to prevent patentees from using patent rights to control sales of unpatented staple articles. This idea is incorporated in the doctrines of contributory infringement and patent misuse. *See generally* *Dawson Chem. Co. v. Rohm & Haas Co.*, 448 U.S. 176 (1980); *Aro Mfg. Co. v. Convertible Top Replacement Co.*, 377 U.S. 476 (1964); *MERGES & DUFFY, supra* note 9, at 1374-75.

predictable, and administrable. These reforms will help ensure that the patent system encourages rather than impedes technological innovation in industries which depend upon the continued development of complex devices.