

**THE SHIFTING SANDS OF PRICE EROSION:
PRICE EROSION DAMAGES SHIFT BY TENS OF
MILLIONS OF DOLLARS DEPENDING UPON THE
ADMISSIBILITY OF PRE-NOTICE ERODED
PRICES**

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Abstract

Competition from an infringing product reduces the price the patent holder can charge for its product. An economist pegs the beginning of the reduced prices to the date the infringing conduct begins. In other words, there is economic harm to the patent holder in the form of falling prices on or soon after the infringing sales begin. However, the accounting period for patent infringement damages

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often begins much later—the commencement of the damage accounting period is usually tied to the date the patent holder gives actual or constructive notice under the patent marking statute. This article addresses whether the calculation of damages on the infringing sales that fall within the accounting period should: a) reflect the fact that, as of the commencement of the accounting period, prices have already eroded to a specific level, or b) employ the fiction that, as of the commencement of the accounting period, there has been no previous erosion in prices. There is sparse and conflicting law regarding whether or not the court should allow damage experts to consider and rely upon evidence of pre-notice eroded prices in calculating price erosion damages. As price erosion is often a major portion of the total damages awarded for patent infringement, this unsettled area of law is ripe for clarification.

I. INTRODUCTION

There are unresolved questions regarding the calculation of price erosion damages.¹ How these questions are answered significantly changes, by as much as tens of millions of dollars or more, the amount of price erosion damages that a patent owner may recover for infringement.²

What gives rise to the question is that infringing sales often begin months, if not years, before the date that damages may first be recovered on the infringing sales. In other words, infringing sales often precede actual or constructive notice of infringement, which is the common commencement date of the accounting period for calculating patent infringement damages.³ With respect to price erosion, price reductions caused by infringement can be traced back

1. See, e.g., *Vulcan Eng'g Co. v. Fata Aluminum, Inc.*, No. CIV.98-74495, 2002 WL 31008328, at *2 (E.D. Mich. Aug. 14, 2002), *aff'd*, No. 02-1623, 2003 WL 21479539, at **1 (Fed. Cir. June 20, 2003) (affirming the district court's award of price erosion damages using pre-damage period data). *But see* *Power Integrations, Inc. v. Fairchild Semiconductor Int'l, Inc.*, No. C.A. 04-1371-JJF, 2006 WL 2435084, at *2 (D. Del. Aug. 22, 2006) (denying a motion to calculate price erosion damages using pre-notice data.).

2. See *infra* Section II.

3. See 35 U.S.C. § 287(a) (2006) (“In the event of failure so to mark, no damages shall be recovered by the patentee in any action for infringement, except on proof that the infringer was notified of the infringement and continued to infringe thereafter, in which event damages may be recovered only for infringement occurring after such notice. Filing of an action for infringement shall constitute such notice.”).

to the date the infringing sales began.⁴ As shown in Figure 1, below, this is the diagonal line of declining prices over time. The entire area from the beginning of infringing sales onward is the economic loss suffered by the patent holder.

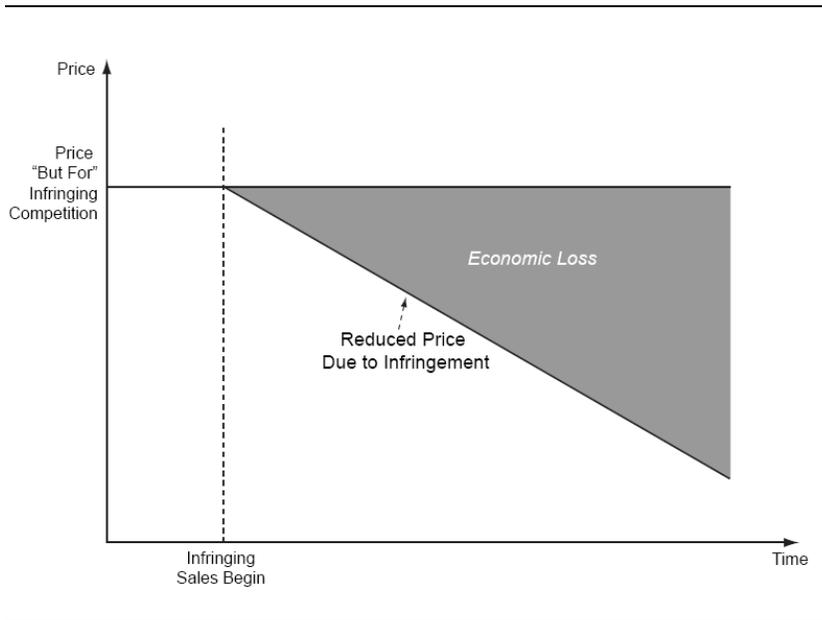


Fig. 1. Economic Loss Due to Price Erosion

As shown in Figure 2, below, rolling the clock forward from the date infringing sales begin to the commencement of the damages accounting period finds prices already significantly reduced below the levels they would have been at “but for” the infringing competition. It is well settled law that the economic loss due to infringing sales which occurred prior to the time of notice is excluded from recovery.⁵ This “*legally unrecoverable*” economic loss to the patent holder is shown in the upper triangular section to the left of the notice line. It is also well settled law that price erosion damages for all infringing sales made after notice are recoverable.⁶ This “*legally recoverable*”

4. See ROBERT S. PINDYCK & DANIEL L. RUBINFELD, MICROECONOMICS 294-95 (7th ed. 2009) (showing that when the infringing sales compete, then they cause lost profits from lost sales and/or price erosion).

5. See 35 U.S.C. § 287(a) (2006).

6. See *id.*

economic loss is shown in the lower triangular section to the right of the notice line.

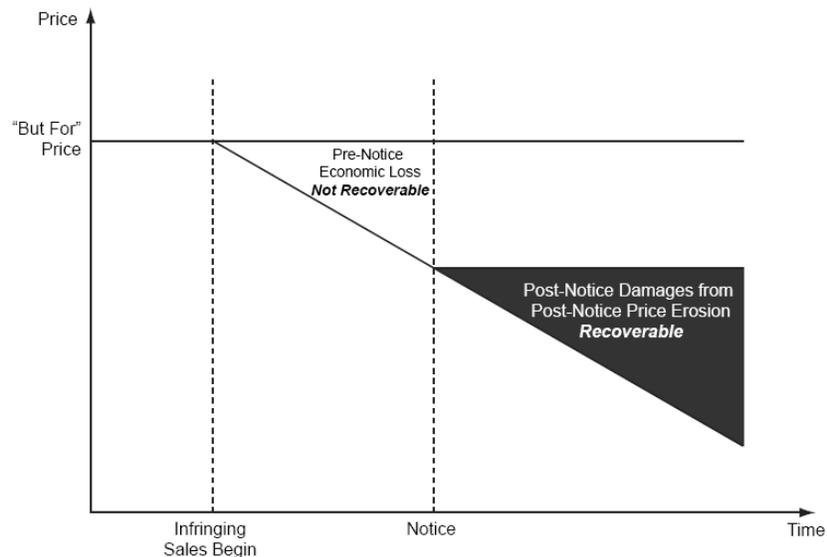


Fig. 2. Effect of Notice on Recovery of Damages

As shown in Figure 2, above, rolling the clock forward from the date infringing sales begin to the commencement of the damages accounting period finds prices already significantly reduced below the levels they would have been at “but for” the infringing competition. It is well settled law that the economic loss due to infringing sales which occurred prior to the time of notice is excluded from recovery.⁷ This “*legally unrecoverable*” economic loss to the patent holder is shown in the upper triangular section to the left of the notice line. It is also well settled law that price erosion damages for all infringing sales made after notice are recoverable.⁸ This “*legally recoverable*” economic loss is shown in the lower triangular section to the right of the notice line.

But what about the economic loss for “post-notice” sales that result from “pre-notice” price erosion? This specific loss is described in the shaded area in Figure 3, below, as the large rectangular portion

7. See 35 U.S.C. § 287(a) (2006).

8. See *id.*

to the right of the notice line. This paper focuses on this unsettled area of law, i.e., it delves into arguments for and against whether this rectangular area should be included in price erosion calculations.

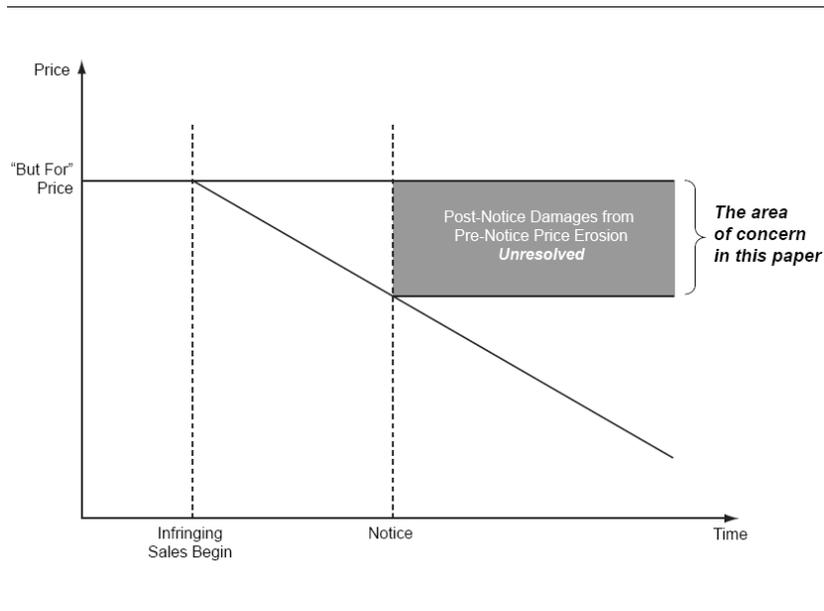


Fig. 3. Unresolved Price Erosion

As demonstrated in Figure 3, the amount of post-notice damages from pre-notice price erosion can be quite significant. It is one thing if the court’s rules regarding the methods for calculating damages *allow* consideration of the *depressed prices* that *pre-date* the accounting period. It is quite another thing if the *earlier decline in prices* is *excluded* from consideration, i.e., where the court applies the fiction that the commencement of the accounting period marks the earliest date for which there has been any reduction in prices due to infringing competition. There is a tremendous difference in the amount of price erosion damages, depending upon which of these two alternate approaches is applied by the court.

The figures above oversimplify price erosion over time. In fact, there is no reason to presume that the prices would fall in a completely linear fashion. Instead, it is not uncommon to observe a relatively sharp decline at the commencement of infringing sales that will slowly taper off in a parabolic fashion as the product price approaches production cost. Figure 4, below, illustrates this situation.

In this more realistic model of price erosion, the inclusion or exclusion of pre-notice price erosion data for post-notice sales becomes an even greater portion of the total potential damage recovery.

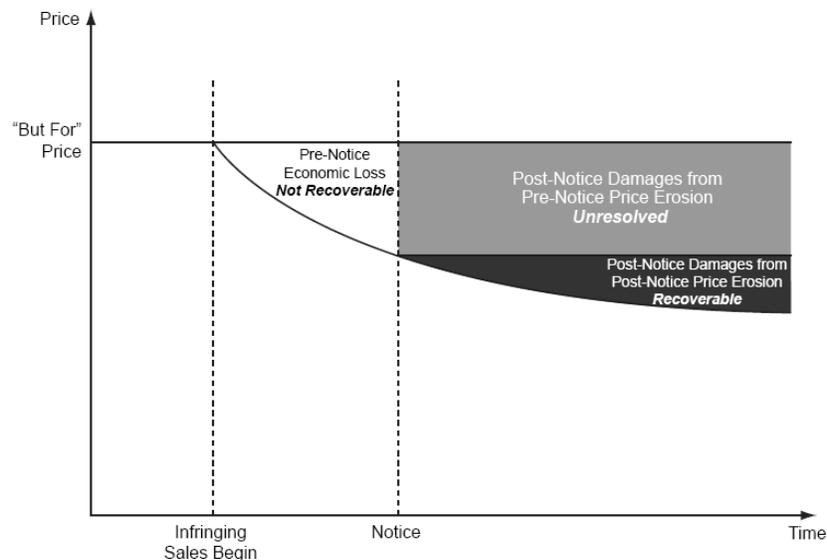


Fig. 4. Real World Price Decline

This article seeks to shed greater light on the issue by describing the unsettled state of the current case law, and presenting the legal and economic arguments for and against allowing consideration of pre-accounting period data on declining prices.

II. BACKGROUND ON PRICE EROSION DAMAGES AND THE ACCOUNTING PERIOD: A TYPICAL SITUATION

We use a hypothetical to understand patent infringement damages generally, and lost profit damages due to price erosion specifically. The hypothetical also sheds further light on the relationship between the commencement of the damages accounting period, on the one hand, and the earlier time period encompassing the accrual of economic loss resulting from infringement-depressed prices, on the other hand.

In our hypothetical, an overseas manufacturer (the patent holder) of high technology computer components holds several U.S. patents on new technologies used in its components. Sales of components using the patented technology began in November, 2002. Worldwide sales exceed one million components per month of which 50% are reasonably estimated to enter the U.S. market via direct sales of the components into the United States, or indirectly through overseas assembly of the components into finished electronic appliances which themselves are sold directly into the United States.⁹

A competing overseas manufacturer (the competitor) begins selling infringing components in January, 2003. The patent holder's U.S. sales arm discovers the infringing activity upon reverse engineering a finished electronics appliance using competitor's components (purchased at a U.S. electronics store). The discovery is made in December, 2003 and the patent holder's legal department sends the competitor a letter in January, 2004 identifying both the infringing components and the U.S. patents that it believes are infringed by these components, and demanding that the competitor cease the infringing conduct or take a license.¹⁰

The parties are unable to resolve their dispute through informal business discussions and the patent holder files a suit for patent infringement in May, 2004. The case is tried to a jury in January, 2007. The jury finds the competitor liable for patent infringement. A

9. Recovery of damages resulting from the infringement of U.S. patents is limited to infringing activity that occurs within the United States. *See* 35 U.S.C. § 271(a) (2006) (“[W]hoever without authority makes, uses, offers to sell, or sells . . . within the United States . . . infringes the patent.”); *see also* MEMC Elec. Materials, Inc. v. Mitsubishi Materials Silicon Corp., 420 F.3d 1369, 1375 (Fed. Cir. 2005) (“It is well-established that the reach of section 271(a) is limited to infringing activities that occur within the United States.”). Hence, it is important to determine that portion of the patent holders and competitor's worldwide sales that directly or indirectly enter the United States.

10. The patent holder's correspondence is sufficient to provide actual notice under the marking statute. *See* SRI Int'l, Inc. v. Advanced Tech. Labs., Inc., 127 F.3d 1462, 1470 (Fed. Cir. 1997) (finding the actual notice requirement is satisfied when the patentee informs the recipient of the identity of both the allegedly infringed patent and the activity that is believed to be an infringement and demands that the recipient cease the infringing conduct.) Due to the extremely small size of the patent holder's components, the fact that these components are “buried” several levels or more within finished electronic appliances, that the first sale and several downstream assemblies thereafter precede entry into the United States, and that patent holder often serves as an original equipment manufacturer (“OEM”) to customers who do not want third-party patent rights identified within their electronics, it is unrealistic to expect that patent holder or its licensees would mark the component or the component packaging with the patent number. In short, there is no constructive notice under the marking statute. Patent holder therefore must rely upon actual notice to trigger the commencement of the damages accounting period under the marking statute.

timeline of the key dates leading up to the lawsuit is provided in Figure 5, below.

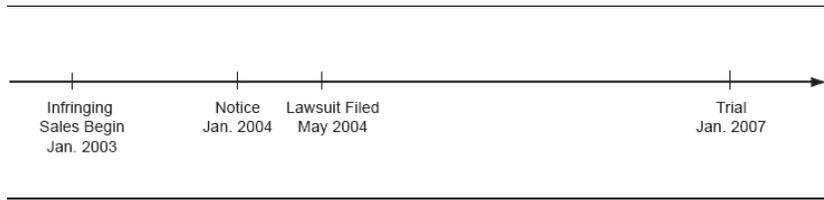


Fig. 5. Timeline

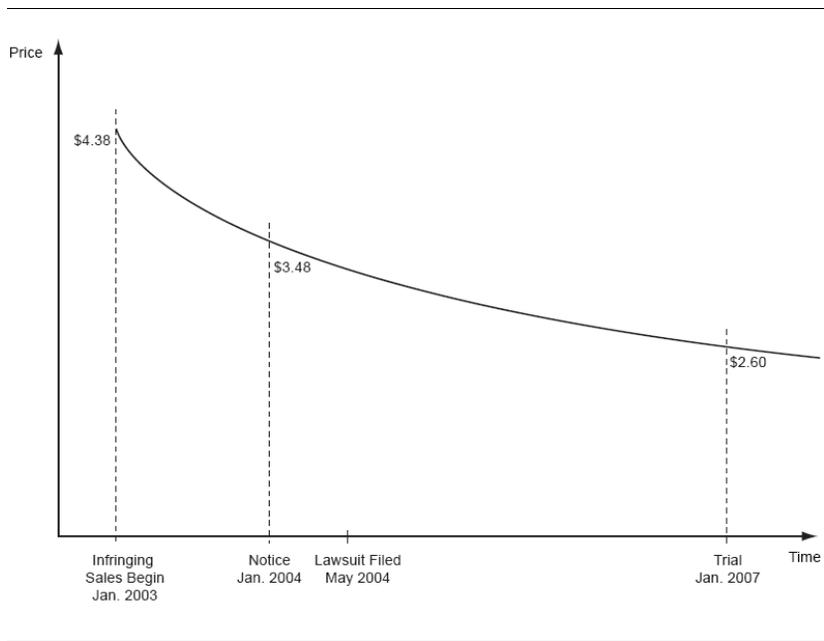


Fig. 6. Eroded Prices

At of the time of trial, the price charged by the patent holder for its components is \$2.60 per unit, reflecting a significant decline over time. In particular, the patent holder's price immediately prior to the commencement of the infringing sales was \$4.38. The price had declined further to \$3.48 as of the date the competitor received actual notice, and continued to decline thereafter through the trial. The reduced prices are depicted in Figure 6, above.

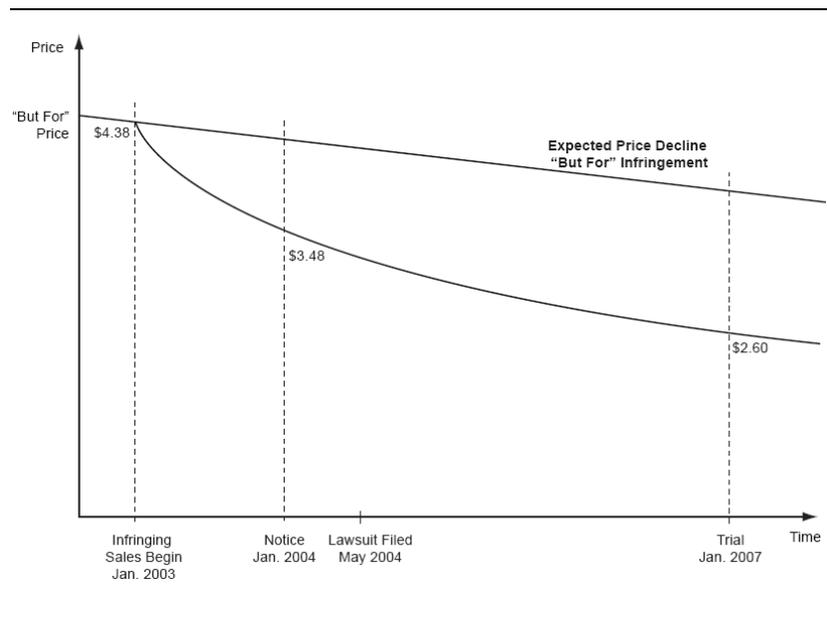


Fig. 7. Compare with "But For" Prices

The patent holder acknowledges that the market for its components is characterized by intense competition and a high level of innovation, and that these market forces compel manufacturers such as the patent holder to reduce their prices. In other words, even absent the infringing competition, prices for the patent holder's components would be expected to decline over time. However, the patent holder saw a much sharper reduction in prices for those components that compete directly with the competitor's infringing products. Taking advantage of this difference, and using regression techniques to control for irrelevant factors, expert economists determined that, "but for" the illicit competition from the infringing products, the price decline would have been more moderate and similar to the trend observed for non-competing components. While the economists differed regarding the exact amount, on average, there was an expected decline of about 24 cents per year absent the infringing competition.¹¹ In Figure 7, above, the expected price decline "but for" the infringement is contrasted with the sharper

11. For the sake of simplicity, we have abstracted from a non-linear trend and from the relatively minor degree of difference between the economists on technical econometric grounds.

decline of prices following commencement of the competitor's infringing sales.

As of the commencement of the damages accounting period in January 2004, the expected component price "but for" infringement was \$4.13, as compared with the lower "infringing" price of \$3.48 at which patent holder was forced to sell in response to competitor's infringing conduct. The difference between these prices, already 65 cents per unit by the time of notice, multiplied by the millions of units sold after notice was given, reflects the patent holder's true economic loss from price erosion due to infringing competition. If the court's methods of calculating price erosion damages *allow* consideration of the depressed prices that pre-date the commencement of the damage accounting period in January 2004, the damages recovered by the patent holder will fully compensate its economic losses due to price erosion. The patent holder's recoverable economic loss is the area is depicted in Figure 8, below.

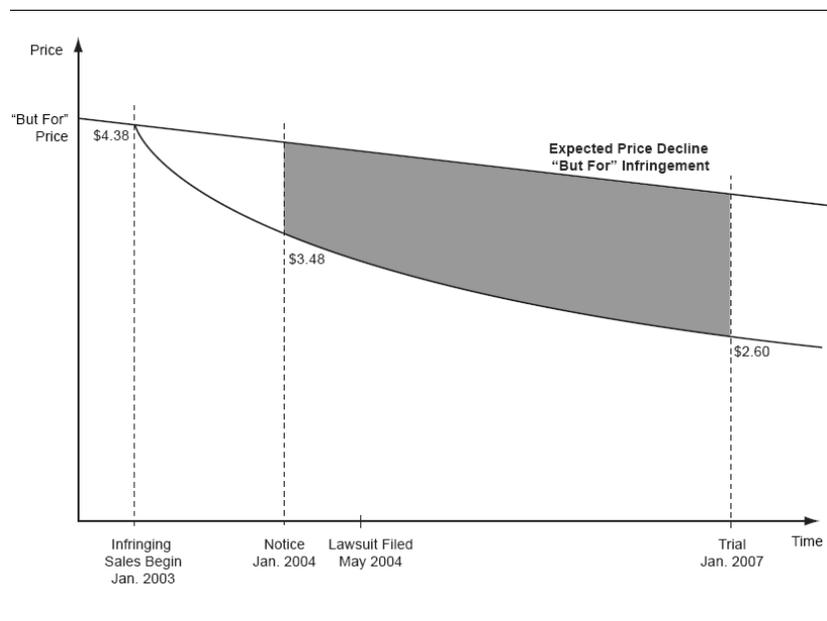


Fig. 8. Post-Notice Economic Harm

However, the damages recovered by the patent holder are much smaller if the court excludes from consideration the decline in prices pre-dating the accounting period, i.e., where the court applies the fiction that no reduction in prices due to infringing competition

occurred until the commencement of the accounting period. Under these circumstances, the recoverable economic loss is limited to the small area depicted in Figure 9, below.

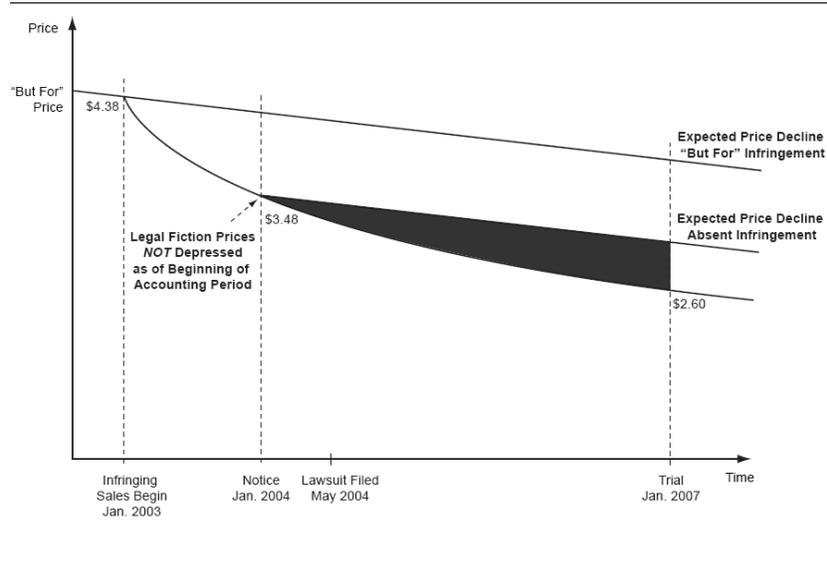


Fig. 9. Limited Recovery Due to Legal Fiction

There is a large difference in the amount of price erosion damages, depending upon which of these two alternatives is chosen by the court. Assuming the patent holder’s monthly sales are on the order of a million units at infringement-depressed prices, and the competitor’s infringing sales are at commensurate levels, the potential price erosion damages are \$28 million if consideration of pre-notice harm is allowed¹² and only \$4.4 million if consideration of pre-notice harm is not allowed.¹³

12. See the area depicted in Figure 8. As discussed in Section IV. A. *infra*, recovery of price erosion damages encompasses depressed prices on not only the patent holder’s sales of units that practice the invention, but also the competitor’s infringing sales (patent holder’s lost profit on the diverted sales is increased to reflect the higher expected prices in the hypothetical market free of infringement).

13. See area depicted in Figure 9.

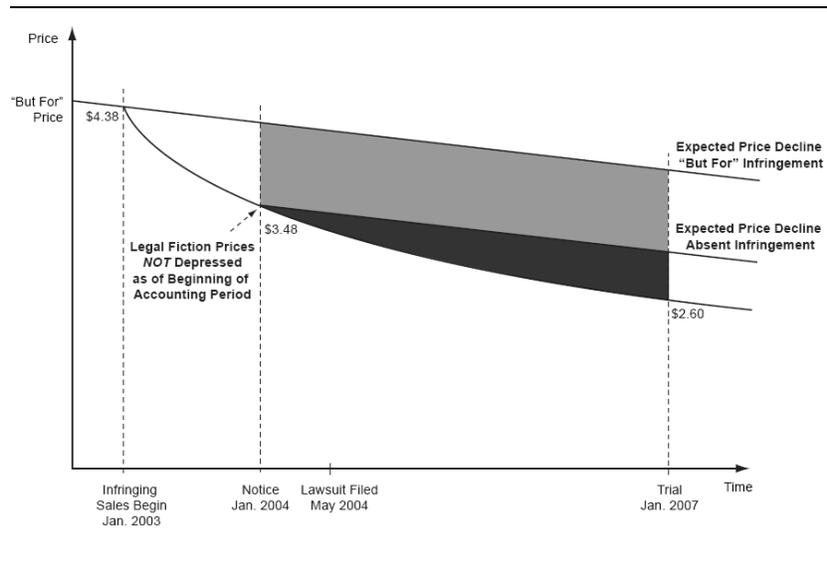


Fig. 10. Full Recovery of Economic Loss

Figure 10, above, demonstrates the dramatic shift in recovery depending upon the calculation method applied by the court. In our hypothetical, the patent holder seeks to recover damages compensating all of its economic losses due to competitor's infringing conduct, including the lost profits on the sales diverted to the competitor and lost profits due to price erosion on all its sales that affect the U.S. market. Our hypothetical patent holder seeks the recovery reflected in Figure 8, above (encompassing both of the areas in Figure 10). However, if the court refuses to allow consideration of pre-notice price erosion, the patent holder's recovery is limited to the smaller area reflected in Figure 9 (the smaller area shown in Figure 10).

III. TUTORIAL REGARDING DAMAGES CALCULATIONS

Before delving deeper into the admissibility of evidence of pre-notice changes in prices, a high-level tutorial on calculating damages will be beneficial.

A. *Elements of Damages: Lost Profits and Reasonable Royalty*

The patent statute provides for compensatory damages as follows:

Upon finding for the claimant, the court shall award the claimant damages adequate to compensate for the infringement, but in no event less than a reasonable royalty for the use made of the invention by the infringer¹⁴

The statute does not instruct the courts how to calculate the statutory damages. Accordingly, courts have filled the void through statutory interpretation. They have interpreted the phrase “damages adequate to compensate” as meaning “*full* compensation for ‘any damages’ [the patent owner] suffered as a result of the infringement.”¹⁵ Courts also have determined that the statutory measure of “damages” is the difference between the patent owner’s pecuniary condition after infringement, and what its condition would have been if the infringement had not occurred.¹⁶ Whatever method is used by the patent holder to prove damages, it must use a method that shows with “reasonable probability” their entitlement to damages.¹⁷ The patentee cannot base its damage claim on “mere speculation and guess.”¹⁸

There are two general categories of patent infringement damages: lost profits and reasonable royalty.¹⁹ The first category, lost profits, is the patent holder’s actual damages.²⁰ It encompasses profits which the patent holder would have received had the infringement not

14. See 35 U.S.C. § 284 (2006).

15. Grain Processing Corp. v. Am. Maize-Prods. Co., 185 F.3d 1341, 1349 (Fed. Cir. 1999) (emphasis added) (citing Gen. Motors Corp. v. Devex Corp., 461 U.S. 648, 654 (1983)).

16. See Brooktree Corp. v. Advanced Micro Devices, Inc., 977 F.2d 1555, 1579 (Fed. Cir. 1992) (“In patent cases, as in other commercial torts, damages are measured by inquiring: had the tortfeasor not committed the wrong, what would have been the financial position of the person wronged?” (citing Aro Mfg. Co. v. Convertible Top Replacement Co. 377 U.S. 476, 507 (1964) (“had the infringer not infringed, what would [the patentee] have made?”))).

17. Micro Chem., Inc. v. Lextron, Inc., 318 F.3d 1119, 1122 (Fed. Cir. 2003).

18. Story Parchment Co. v. Patterson Parchment Paper Co., 282 U.S. 555, 563 (1931); see also N.D. Cal. Model Patent Jury Instr. B.5.1 (Nov. 29, 2007) (“While [patent holder] is not required to prove its damages with mathematical precision, it must prove them with reasonable certainty. [Patent holder] is not entitled to damages that are remote or speculative.”).

19. This is not to say that the relief available to the patent holder upon a finding of infringement is limited to lost profits or reasonable royalty. Assuming infringement, the patent holder also may be entitled to enhanced damages, see 35 U.S.C. § 284 ¶ 2 (2006) (contingent upon proof of willful infringement), attorney’s fees, 35 U.S.C. § 285 (2006) (upon proving an “exceptional case”), preliminary and permanent injunctive relief, 35 U.S.C. § 283 (2006) (in accordance with equitable principles), and costs and pre-and post-judgment interests as allowed under State and Federal statutes of general application. The latter categories of relief, i.e., those other than compensatory money damages, while important, are not relevant to obtaining money damages and therefore are outside the scope of this discussion.

20. See State Indus., Inc. v. Mor-Flo Indus., Inc., 883 F.2d 1573, 1577 (Fed. Cir. 1989).

occurred.²¹ “The ‘but for’ inquiry therefore requires a reconstruction of the market . . . absent the infringing product”²² In order “[t]o prevent the hypothetical [nature of this enterprise] from lapsing into pure speculation, . . . [the patent holder seeking lost profit damages has the burden of providing] sound economic proof of the nature of the market and likely outcomes with infringement factored out of the economic picture.”²³ Consistent with the court’s interpretation of the statute as requiring full compensation for any damages, the patent holder is entitled to recover “any foreseeable lost profits [that it] can prove.”²⁴ The patent holder is given “significant latitude to prove and recover lost profits for a wide variety of foreseeable economic effects of infringement.”²⁵

If actual damages cannot be ascertained from the record, then, at a minimum, the patent holder is entitled to a “reasonable royalty.”²⁶ In practice, damages are often awarded in both categories. To the extent that lost profits are proven for some, but not all infringing sales, the patent holder is still entitled to a reasonable royalty on the remainder.²⁷ It is well settled law that for calculating a reasonable royalty, the time frame of interest is “the date when the infringement began.”²⁸ The appropriate time frame for calculating lost profits, however, remains unsettled.²⁹

21. *Id.*

22. *Grain Processing Corp. v. Am. Maize-Products Co.*, 185 F.3d 1341, 1350 (Fed. Cir. 1999).

23. *Id.*

24. *Id.* at 1349 (citing *Rite-Hite Corp. v. Kelley Co.*, 56 F.3d 1538, 1545-47 (Fed. Cir. 1995)).

25. *Id.* at 1350.

26. *Id.* at 1349.

27. *State Indus., Inc. v. Mor-Flo Indus. Inc.*, 883 F.2d 1573, 1577 (Fed. Cir. 1989); *see also* *Crystal Semiconductor Corp. v. TriTech Microelectronics Int’l, Inc.*, 246 F.3d 1336, 1354 (Fed. Cir. 2001) (“Thus, a patentee may obtain lost profit damages for that portion of the infringer’s sales for which the patentee can demonstrate ‘but for’ causation and reasonable royalties for any remaining infringing [sales].”) (citing *King Instruments Corp. v. Perego*, 65 F.3d 941, 952-53 (Fed. Cir. 1995)).

28. *E.g.*, *Wang Labs., Inc. v. Toshiba Corp.*, 993 F.2d 858, 870 (Fed. Cir. 1993) (quoting *Hanson v. Alpine Valley Ski Area, Inc.*, 718 F.2d 1075, 1079 (Fed. Cir. 1983)).

29. *See e.g.*, *Vulcan Eng’g Co. v. Fata Aluminum, Inc.*, No. CIV.98-74495, 2002 WL 31008328, at *2 (E.D. Mich. Aug. 14, 2002), *aff’d*, No. 02-1623, 2003 WL 21479539, at **1 (Fed. Cir. June 20, 2003) (affirming district court’s award of price erosion damages using pre-damage period data). *But see* *Power Integrations, Inc. v. Fairchild Semiconductor Int’l, Inc.*, No. C.A. 04-1371-JJF, 2006 WL 2435084, at *2 (D. Del. Aug. 22, 2006) (denying motion to calculate price erosion damages using pre-notice data).

B. *Lost Profits Based On "Lost Sales"*

This article focuses on lost profits, which itself can take several different forms.³⁰ One form of lost profits is "lost sales," and is based upon sales of the patent holder that were diverted to the infringer due to its infringing conduct.³¹ With respect to these "diverted sales," the patent holder seeks to recapture the profits it would have made "but for" the infringement.³²

C. *Lost Profits Based on "Price Erosion"*

In addition to "lost sales," "price erosion" is another well-established form of lost profits. Courts have long-recognized the causal relationship between infringing sales and depressed prices.³³ A competitor's infringing sales adversely affect the patent owner's pecuniary condition by forcing the patent holder to reduce its prices in order to better compete with the infringing competition, which in turn reduces the patent owner's profits.³⁴ As stated in the Supreme Court's 1886 decision *Yale Lock Mfg. Co. v. Sargent*,³⁵ when a plaintiff sells a product covered by his patent, "reduction of prices and consequent loss of profits, enforced by infringing competition, is a proper ground for awarding damages."³⁶

Accordingly, there is substantial support in the caselaw for a price erosion theory of patent infringement damages.³⁷ In order to

30. The better recognized forms of lost profit damages are lost profits resulting from sales lost or diverted to the accused infringer, price erosion resulting from the infringing competition, and the patent holder's increased expenditures caused by infringement. *See* *Lam, Inc. v. Johns-Manville Corp.*, 718 F.2d 1056, 1065 (Fed. Cir. 1983). Lost sales and price erosion are expressly described in this article.

31. *See* *Water Techs. Corp. v. Calco, Ltd.*, 850 F.2d 660, 671 (Fed. Cir. 1988) (stating that recovery of lost profits on diverted sales requires some showing by patent holder that, but for the infringing activity, the patent holder would have made the infringer's sales).

32. *See id.*

33. *See In re Mahurkar Double Lumen Hemodialysis Catheter Patent Litigation*, 831 F. Supp. 1354, 1384 (N.D. Ill. 1993) ("An infringer's activities do more than divert sales to the infringer. They also depress the price."), *aff'd*, 71 F.3d 1573 (Fed. Cir. 1995); *see also* *Kalman v. Berlyn Corp.*, No. CIV. A. 82-0346-F, 1988 WL 156126, at *8 (D. Mass. July 25, 1988) ("When the relevant market includes only two competitors, one may infer that the patentee would have charged higher prices but for the competition caused by the infringement."), *aff'd in part, rev'd in part and remanded* 914 F.2d 1473 (Fed. Cir. 1990).

34. *See* Section IV *infra*.

35. *Yale Lock Mfg. Co. v. Sargent*, 117 U.S. 536 (1886).

36. *Id.* at 551.

37. *See* *Ericsson, Inc. v. Harris Corp.*, 352 F.2d 1369, 1378 (Fed. Cir. 2003); *Crystal Semiconductor Corp. v. Tritech Microelectronics Int'l, Inc.*, 246 F.3d 1336, 1357-58 (Fed. Cir. 2001); *TWM Mfg. Co. v. Dura Corp.*, 789 F.2d 895, 902 (Fed. Cir. 1986); *Brooktree Corp. v. Advanced Micro Devices, Inc.*, 977 F.2d 1555, 1579 (Fed. Cir. 1992); *Minn. Mining & Mfg.*

recover price erosion damages, the patentee must show that, if there had been no infringement (i.e., “but for” infringement), it would have sold its products at higher prices.³⁸ In addition, credible economic analysis of price erosion requires that the patentee present evidence of the (presumably reduced) amount of product the patentee would have sold at the higher price.³⁹

In calculating price erosion damages, courts have made a point of considering the economic principle of price elasticity.⁴⁰ This principle describes the relationship between price and demand—the more elastic the market, the greater the drop in demand upon an increase in prices.⁴¹ Conversely, if the market is inelastic, an increase in price will not result in lower demand.⁴² Thus, a patent holder seeking to recover price erosion damages must present evidence of the reduced amount of product the patent holder would have sold at the higher price in the “but for” market free of infringing competition.⁴³

Price erosion damages encompass both the profits the patent holder loses on the sales that it continues to make (sometimes referred to as “lost price opportunity” or “lost margin” sales) as well as the profits the patent holder loses on the sales “lost” to the infringer.⁴⁴ Another way of stating this observation is that price erosion refers to depressed prices on not only the units of sales *lost*, but also for the units of sales *made* by the patent holder.

Co. v. Johnson & Johnson Orthopaedics, Inc., 976 F.2d 1559, 1578-79 (Fed. Cir. 1992); Lam, Inc. v. Johns-Manville Corp., 718 F.2d 1056, 1067 (Fed. Cir. 1983).

38. *Ericsson*, 352 F.2d at 1378 (citing *BIC Leisure Prods., Inc. v. Windsurfing Int’l, Inc.*, 1 F.3d 1214, 1220 (Fed. Cir. 1993)).

39. *See id.* at 1378 (citing *Crystal Semiconductor*, 246 F.3d at 1357).

40. *See, e.g., Crystal Semiconductor*, 246 F.3d at 1359; *Minn. Mining*, 976 F.2d at 1578-79; *In re Mahurkar Double Lumen Hemodialysis Catheter Patent Litigation*, 831 F. Supp. 1354, 1389 (N.D. Ill. 1993), *aff’d* 71 F.3d 1573 (Fed. Cir. 1995).

41. *See* William M. Landes & Richard A. Posner, *Market Power in Antitrust Cases*, 94 HARV. L. REV. 937, 939-40 (1981) (describing relations among elasticity of demand, market share, cost, and price).

42. *Id.*

43. *See Crystal Semiconductor*, 246 F.3d at 1356 (“[I]n a credible economic analysis, the patentee cannot show entitlement to a higher price divorced from the effect of that higher price on demand for the product. In other words, the patentee must also present evidence of the (presumably reduced) amount of product the patentee would have sold at the higher price.”).

44. *See Ericsson, Inc. v. Harris Corp.*, 352 F.2d 1369, 1376-78 (awarding damages for lost sales and lost profits due to price erosion); *see also* David L. Applegate, *A Billion Here and Billion There: Talking Real Money in the Patent Damages Case*, 910 PRACTICING L. INST. 1367, 1380-81 (2007).

That lost sales and price erosion are both measures of lost profits, and, further, that price erosion encompasses eroded prices on both “lost sales” and “made sales,” is depicted in Figure 11, below.

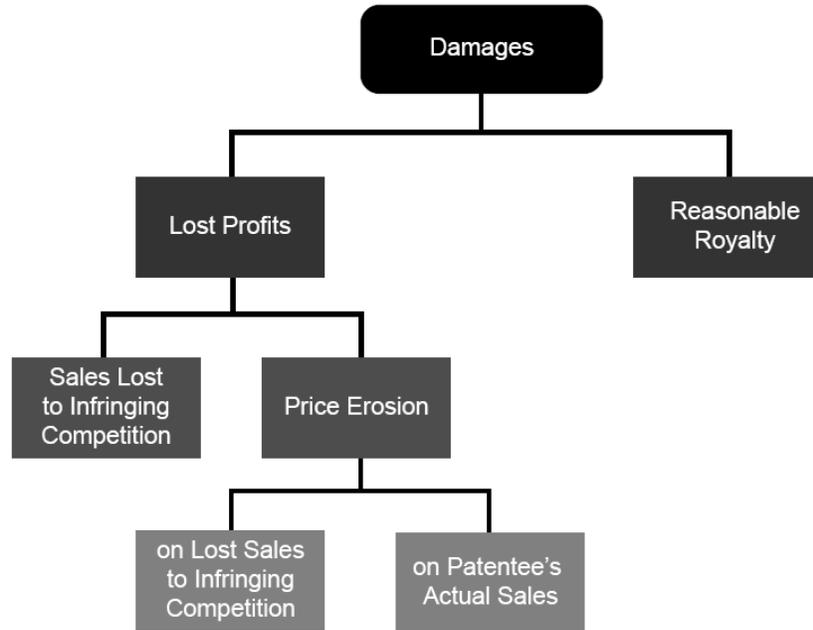


Fig. 11. Elements of Damages

The same relationships can be demonstrated by mapping them against the price and coordinates, as in Figure 12, below. Figure 12 also includes the adjustment typically made by economists (and required by the courts) for price elasticity, namely that as prices increase, there typically is some amount of a reduction in demand.⁴⁵

Price erosion damages are not awarded as often as lost profits based upon lost sales,⁴⁶ reflecting the stringent proof requirements

45. For almost all goods (normal goods), a fall in the price will result in more being purchased and vice versa. See PINDYCK & RUBINFELD, *supra* note 4, at 120-21. This is sometimes referred to as “The Law of Downward-Sloping Demand” See PAUL A. SAMUELSON & WILLIAM D. NORDHAUS, *ECONOMICS* 39 (15th ed. 1995).

46. See Gregory J. Werden et al., *Quantity Accretion: Mirror Image of Price Erosion from Patent Infringement*, 81 J. PAT. & TRADEMARK OFF. SOC’Y 479, 480 (1999) (citing Ronald B. Cooley, *Overview and Statistical Study of the Law on Patent Damages*, 75 J. PAT. & TRADEMARK OFF. SOC’Y 515, 518 (1993)).

associated with this theory of recovery.⁴⁷ From an economic perspective, “awards for price erosion should be more routine.”⁴⁸ Nonetheless, where patentees and their experts have been able to muster sufficient supporting evidence, they have often obtained jury awards for price erosion damages exceeding tens of millions of dollars or more.⁴⁹ Furthermore, it is not uncommon for price erosion to be the single largest portion of the overall damage recovery.⁵⁰ This is due in no small part to the fact that recovery for price erosion is allowed in connection with both “lost sales” and “made sales.”⁵¹

47. As discussed above, the patentee has the burden of proving price erosion damages by “sound economic proof.” This proof includes, among other things, proof that the patentee reduced prices in response to the infringing competition as well as proof of the specific amount of the price reduction, *see* *Vulcan Eng. Co., Inc. v. Fata Aluminum, Inc.*, 278 F.3d 1366, 1377 (Fed. Cir. 2002), and the presentation of evidence on whether the market is inelastic (higher prices would not result in reduced demand) or elastic (higher prices result in reduced demand), *see* *Crystal Semiconductor*, 246 F.3d at 1359.

48. *See* *Werden et al.*, *supra* note 46, at 480 (“[A]wards for price erosion should be more routine. One would always expect some price effect from competition between the patentee and the infringer, since competition between two firms nearly always results in a lower price.”).

49. *See, e.g.*, *Minn. Mining & Mfg. Co. v. Johnson & Johnson Orthopaedics, Inc.*, 976 F.2d 1559, 1578-82 (Fed. Cir. 1992) (affirming district court judgment of \$29 million for price erosion); *Honeywell Int’l, Inc. v. Hamilton Sundstrand Corp.*, 166 F. Supp. 2d 1008, 1019 (D. Del. 2001) (trial court denied accused infringer’s post-trial motion to set aside jury award of \$45 million for price erosion damages), *aff’d in part, vacated in part on other grounds and remanded*, 370 F.2d 1131, 1146 (Fed. Cir. 2004); *Electro Scientific Indus., Inc. v. Gen. Scanning Inc.*, 247 F.3d 1341 (Fed. Cir. 2001) (affirming denial of judgment as a matter of law on the jury’s award of \$13.1 million for lost profits and price erosion damages); *Atmel Corp. v. Silicon Storage Tech., Inc.*, Nos. 02-1522, 02-1523, 2003 WL 22129398, at **13 (Fed. Cir. Sep. 12, 2003) (affirming entry of judgment on jury verdict for price erosion damages of \$10,400,000); *Micro Motion, Inc. v. Exac Corp.*, 761 F. Supp. 1420, 1434 (N.D. Cal. 1991) (awarding price erosion damages of \$14,649,084); *Fiskars, Inc. v. Hunt Mfg. Co.*, 221 F.3d 1318, 1324-26 (Fed. Cir. 2000) (affirming entry of judgment on jury award of price erosion damages of \$2,984,202). *See also* *Crystal Semiconductor*, 246 F.3d at 1358 (affirming trial court’s grant of judgment as a matter of law to invalidate jury verdict of \$26,649,766 for price erosion damages); *Asyst Techs., Inc. v. Empak, Inc.*, No. C 98-20451 JF (EAI), 2007 WL 2255220, at *10 (N.D. Cal. Aug. 3, 2007) (granting judgment as a matter of law, and thereby, nullifying a jury award of \$43.2 million for price erosion damages due to insufficient evidence to support a finding of liability); *Power Integrations, Inc. v. Fairchild Semiconductor Int’l, Inc.*, 589 F. Supp. 2d 505, 512 (D. Del. 2008) (granting post-trial motion to remit jury award of \$14,971,272 for price erosion damages by 80% consistent with pro rata share of infringing products entering the United States).

50. *See, e.g.*, *Minn. Mining*, 976 F.2d at 1578 (\$28,923,219 for price erosion damages out of total award of \$53,636,348); *Fiskars*, 221 F.3d at 1324 (\$2,984,202 for price erosion damages out of total award of \$3,098,962); *Atmel Corp.*, 2003 WL 22129398 at **7 (\$10,400,000 for price erosion damages out of total award of \$19,969,000); *Honeywell*, 166 F. Supp. 2d at 1013-14 (\$45 million for price erosion damages out of total award of \$46.6 million); *Micro Motion.*, 761 F. Supp. at 1435 (\$14,649,084 for price erosion damages out of total award of \$20,821,520).

51. *See* *Applegate*, *supra* note 44, at 1380-81.

D. The Accounting Period for Damage Recovery

The amount of damages a patentee may recover in an infringement suit is limited under the marking statute⁵² to acts of infringement that occur after the patentee gives the alleged infringer notice of infringement.⁵³ The marking statute provides in part:

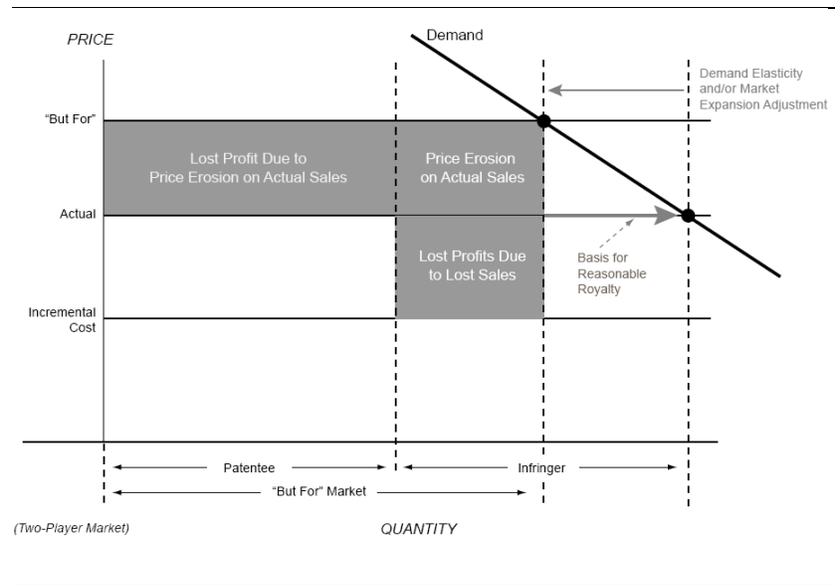


Fig. 12. Economist View of Patent Damages

(a) Patentees, and persons making, offering for sale, or selling within the United States any patented article for or under them, or importing any patented article into the United States, may give notice to the public that the same is patented, either by fixing thereon the word “patent” or the abbreviation “pat.,” together with the number of the patent, or when, from the character of the article, this cannot be done, by fixing to it, or to the package wherein one or more of them is contained, a label containing a like notice. In the event of failure so to mark, no damages shall be recovered by the patentee in any action for infringement, except on proof that the infringer was notified of the infringement and continued to infringe thereafter, in which event damages may be recovered only

52. 35 U.S.C. § 287(a) (2006).

53. *Id.*

for infringement occurring after such notice. Filing of an action for infringement shall constitute such notice.⁵⁴

“The statute permits either constructive notice, which is accomplished by marking the article or its packaging with the patent number, or actual notice.”⁵⁵ “[T]he actual notice requirement of § 287(a) is satisfied when the recipient is informed of the identity of the [allegedly infringed] patent and the activity that is believed to be an infringement, accompanied by a proposal to abate the infringement, whether by license or otherwise.”⁵⁶ A “proposal to abate” is broadly interpreted to encompass a threat by the patentee to file suit, a demand by the patentee to cease the infringing conduct, or an offer by the patentee to license the patent.⁵⁷

1. Purpose of the Marking Statute

The marking statute serves three related purposes: “1) helping to avoid innocent infringement; 2) encouraging patentees to give notice to the public that the article is patented; and 3) aiding the public to identify whether an article is patented.”⁵⁸ In order to further these purposes, Congress structured the marking statute so as to tie failure to mark with the inability to collect damages prior to notice.⁵⁹

54. *Id.* The notice provisions in the marking statute do not apply in situations where there is no tangible item to be marked. Accordingly, neither marking nor actual notice is required if the asserted patent claim is directed to a method or process (as opposed to a tangible product or apparatus that is capable of being marked). *Am. Med. Sys., Inc. v. Med. Eng'g Corp.*, 6 F.3d 1523, 1538 (Fed. Cir. 1993). Similarly, under the predecessor of § 287, even if the asserted claim is directed to a product or apparatus, the notice requirements do not apply if the patent holder does not sell a product covered by the claim. *Wine Ry. Appliance Co. v. Enter. Ry. Equip. Co.*, 297 U.S. 387, 398 (1936) (interpreting the predecessor marking statute of 35 U.S.C. § 287). In these situations, damages are calculated as of the date infringement began or the patent issues, whichever is later. *See* N.D. Cal. Model Patent Jury Instr. B.5.8 (Nov. 29, 2007). *See also Crystal Semiconductor*, 246 F.3d at 1353 (granting damages to patentee from the date the infringing activity began since the asserted patent claims were only directed to a method, and neither the marking nor actual notice requirements were applicable).

55. *Crown Packaging Tech., Inc. v. Rexam Beverage Can Co.*, 498 F. Supp. 2d 718, 724 (D. Del. 2007).

56. *SRI Int'l. v. Advanced Tech. Labs., Inc.*, 127 F.3d 1462, 1470 (Fed. Cir. 1997).

57. *See id.*

58. *Nike, Inc. v. Wal-Mart Stores, Inc.*, 138 F.3d 1437, 1443 (Fed. Cir. 1998) (citations omitted).

59. *Am. Med. Sys.*, 6 F.3d at 1537 (“Congress structured the statute so as to tie failure to mark with disability to collect damages Furthermore, allowing recovery of damages from the point of full compliance with the marking statute further the policy of encouraging marking to provide notice to the public”).

2. Affirmative Act by Patentee

The notice required by the marking statute must come from the patentee; it must be an affirmative act by patentee that informs the defendant of infringement.⁶⁰ The rationale for requiring an affirmative act by the patentee is that it furthers the marking statute's purpose of helping the alleged infringer avoid infringement (the first of the three marking statute purposes identified above).⁶¹ As explained by the Federal Circuit, absent affirmative notification from the patentee, the alleged infringer may lack knowledge of the patentee's identity.⁶² Consequently the accused infringer "may lose the opportunity to consult with the patentee about non-infringing design changes, to negotiate a valid license, or to seek an early adjudication of rights in a declaratory judgment proceeding—all or any of which could facilitate the avoidance of infringement."⁶³

3. Related Rules Regarding the Commencement of Damages

There are, of course, rules other than the notice provisions in the marking statute that limit the period for which patent infringement damages may be recovered. For example, the well-established rule is that the patentee's right to exclude others from practicing the patented invention does not inure until the patent issues.⁶⁴ Thus, the patentee may obtain damages only for acts of infringement occurring after the patent issues.⁶⁵ Furthermore, damages may not be recovered for infringing sales made "more than six years prior to the filing of the complaint or counterclaim for infringement."⁶⁶ The patent statute limits how far the patentee can "look back" for purposes of

60. *Lans v. Digital Equip. Corp.*, 252 F.3d 1320, 1327 (Fed. Cir. 2001) (finding no affirmative act by patentee and therefore no actual notice, even though the accused infringer did in fact receive notice of alleged infringement from a party associated with patentee); *see also Am. Med. Sys.*, 6 F.3d at 1537 (finding notice to alleged infringer by its own counsel does not satisfy the marking statute); *Crown Packaging Tech.*, 498 F. Supp. 2d at 729 (finding alleged infringer's knowledge of infringement irrelevant to whether patentee met statutory requirement for notice).

61. *See Lans*, 252 F.3d at 1327.

62. *Id.*

63. *Id.* ("Thus, without knowledge of the patentee's identity, an alleged infringer may lose the benefit of this primary purpose [helping avoid infringement] of the notice requirement.")

64. *Gargoyles, Inc. v. United States*, 113 F.3d 1572, 1581 (Fed. Cir. 1997).

65. *Johns Hopkins Univ. v. Cellpro, Inc.*, 152 F.3d 1342, 1366 (Fed. Cir. 1998) (citing *Hoover Group, Inc. v. Custom Metalcraft, Inc.*, 66 F.3d 299, 304 (Fed. Cir. 1995)).

66. 35 U.S.C. § 286 (2006).

recovering damages on prior infringing sales or other prior infringing conduct.⁶⁷

4. Instructing the Jury: Commencement of Damages

In jury trials for patent infringement, the rules relating to the commencement of the damages accounting period are typically incorporated in a single jury instruction. For example, in the Northern District of California, where the patentee sells a product that includes the claimed invention, but has not marked the product with the patent number, the jury is instructed that “[d]amages that . . . may be awarded by you commence on the date that [the] [alleged infringer] . . . received actual written notice.”⁶⁸ The jury is also instructed that “damages should be calculated as of” the later of the date the infringing activity began or the date the patent issued.⁶⁹ In comparison, where there is no disagreement regarding the date from which the damages calculation should begin, the court may simply instruct the jury to preclude recovery of damages prior a specific date, as a court from the District of Delaware instructed in *Power Integrations, Inc. v. Fairchild Semiconductor International, Inc.*⁷⁰

IV. THE ECONOMIST’S PERSPECTIVE ON PRICE EROSION

A. *Infringing Conduct Causes Economic Harm in the Form of Depressed Prices*

The fact that competing sales generally depress prices is an accepted principle in the field of economics.⁷¹ For example, one economist stated: “To an economist, . . . awards for price erosion should be more routine. One would always expect some price effect from competition between the patentee and the infringer, since competition between two firms nearly always results in a lower price.”⁷² Similarly, Paul Samuelson and William Nordhaus state that in a perfectly competitive market, “[a]n increase in the supply of a commodity (the demand curve being constant) will generally lower

67. *Id.*; see also *Standard Oil Co. v. Nippon Shokubai Kagaku Kogyo Co.*, 754 F.2d 345, 348 (Fed. Cir. 1985).

68. N.D. Cal. Model Patent Jury Instr. B.5.8 Patent Damages (Nov. 29, 2007).

69. *Id.*

70. Memorandum Order at 2, *Power Integrations, Inc. v. Fairchild Semiconductor Int’l., Inc.*, C.A. No. 04-1371-JJF (D. Del. June 2, 2006) (order granting defendant’s motion for partial summary judgment precluding the plaintiff from recovering damages prior to specific date).

71. See *Werden et al.*, *supra* note 46, at 480.

72. *Id.*

the price and increase the quantity bought and sold.”⁷³ With reasonable assumptions, the same is generally true for many varieties of imperfectly competitive markets as well.⁷⁴

B. Pre-Commencement Economic Data Can Be Relevant for Estimating the Full Economic Loss Due to Infringement

The loss of profits due to competition is an economic fact, irrespective of whether the competition is lawful and whether the loss is compensable if it is unlawful. Economic harm due to infringing competition is an economic fact as soon as the infringing competition begins. However, the law may limit the recovery of lost profits damages to a time period that starts later than the first infringing activity.⁷⁵ The law may also limit the time period of damages to end at the date of an injunction.⁷⁶ Despite these legal limitations, the economic analysis of the impact of competition, and its data requirements, remain the same.

In general, economists expect that the impact of “increased competition”—that is, the entry of a new supplier into a particular market—is to lower the price in the market and increase the total quantity sold.⁷⁷ The competitive impact on an incumbent competitor (such as a patentee), therefore, would usually involve lower profits not just from losing sales to the new competitor, but also from receiving a lower price on all its goods.⁷⁸ This is most easily

73. See SAMUELSON & NORDHAUS, *supra* note 45, at 144.

74. Imperfectly competitive markets involve one seller (monopoly) or a relatively small number of sellers, such that some degree of power to set prices exists. The fact that competitive entry is usually associated with price declines is perhaps most clearly seen in the inverse situation of a merger analysis, which looks at how much consumer prices would likely *increase* if a merger that removes a competitor is allowed to occur. See U.S. DEP’T OF JUSTICE & FED. TRADE COMM’N., HORIZONTAL MERGER GUIDELINES 18-22 (1997). The same principles can be used to look at how much consumer prices would likely *decrease* due to the entry of a new (infringing) competitor. See generally Gregory J. Werden et al., *Lost Profits from Patent Infringement: The Simulation Approach*, 7 INT’L J. ECON. BUS. 213 (2000).

75. See, e.g., 35 U.S.C. § 287(a) (2006).

76. Damages for patent infringement are at least “the reasonable royalty for the use of the invention by the infringer.” See 35 U.S.C. § 284 (2006) (emphasis added). While the patent statute grants courts the authority to enjoin the infringing use, see 35 U.S.C. § 283, the entry of the injunction “prevents the violation of any right secured by the patent” and therefore cuts off legally recoverable damages as of the effective date of the injunction. See *id.* Cf. *Amado v. Microsoft Corp.*, 517 F.3d 1353, 1361-62 (Fed. Cir. 2008) (noting that the trial court entered a permanent injunction following jury verdict for patent holder, but the injunction was stayed pending appeal, such that the infringing use of the patent continued, thereby extending the damage period to include the additional, post-verdict infringing use).

77. PINDYCK & RUBINFELD, *supra* note 4, at 295.

78. See *id.* at 350-55 (discussing “marginal revenue”).

illustrated in the case of “competitive markets.” A competitive market is one where individual sellers and buyers have little “market power,” that is, very little ability to individually affect the market price.⁷⁹ The “market mechanism” is the tendency of markets to reach equilibrium (a stable balance of forces) by changing the price until the quantity freely offered for sale equals the quantity freely accepted for purchase.⁸⁰ The quantity suppliers freely offer for sale, however, depends not just on price received but also on their costs.⁸¹ At equilibrium, the market clears and there is no further tendency for prices and quantities to change.⁸² But if, for example, the supply curve shifts rightward because of the entry into the market of a new competitor, with other things held constant, the market mechanism would produce a movement to a new equilibrium, at a lower price, and a larger amount of goods traded, as shown in Figures 13A and 13B.⁸³

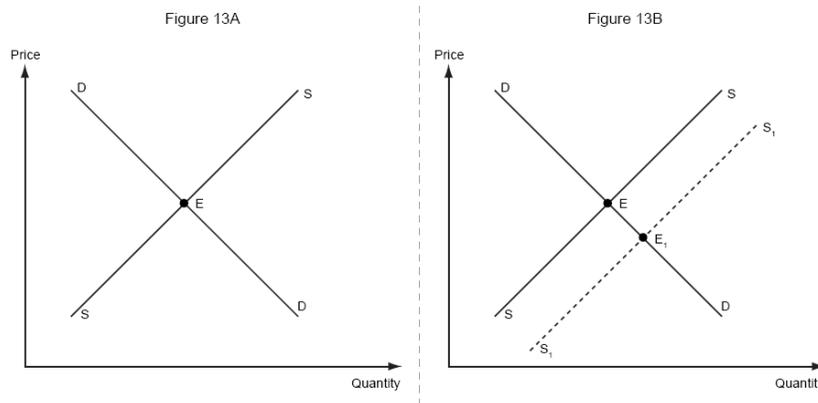


Fig. 13A & 13B. Disruption of Equilibrium Due to Infringing Competition

In determining the loss of profits for a particular firm due to competition, an economist employs a number of well-recognized analytical tools. The fundamental tool is supply and demand estimation. Once supply and demand are estimated, it becomes

79. *Id.* at 26.

80. *Id.* at 25.

81. *Id.* at 23.

82. *Id.* at 25.

83. *See id.* at 26-27.

possible to predict what price and quantity the firm would obtain, for example, in the absence of the market entry of an infringing competitor. For reasonably modest changes in price and quantity, estimating linear supply and demand curves, along with “elasticities,” (on a proportional basis, how supply and demand respond to price changes) provides an analytic framework⁸⁴ (over time, in the absence of a sufficient amount of price and quantity information, it may be useful to engage in a case study such as comparing price changes to appropriate benchmarks).⁸⁵ For larger changes in price and quantity, a statistical technique commonly referred to as “regression analysis” provides more accurate estimates of changes in supply and demand and also allows the researcher to control for outside events such as the behavior of demand in the industry or the economy as a whole, or changes in input prices.⁸⁶

All of these techniques require the consideration of historical prices, quantities, and costs for particular products of a firm or firms in a particular market.⁸⁷ Profits, by definition, are the difference between revenue (price times quantity) and costs.⁸⁸ Estimating a loss in profits due to competition, therefore, requires estimating the change in the market price due to the new competition, and the change in the sales quantity for the firm. The typical result is a decrease in firm revenues from lower quantities sold and/or lower prices (frequently both), together with a decrease in costs due to lower sales.⁸⁹ In economic terms, price and quantity are inextricably linked and must be estimated together.⁹⁰ However, it is not uncommon to refer to these separately, with the quantity change as “lost sales” and the price change as “price erosion.”⁹¹ In order to statistically determine the impact of an event such as the beginning of infringing

84. *See id.* at 49-50.

85. Jean Tirole, *THE THEORY OF INDUSTRIAL ORGANIZATION* 4 (1988).

86. *See generally* PINDYCK & RUBINFELD, *supra* note 4, at 687-92.

87. *Id.* at 689.

88. SAMUELSON & NORDHAUS, *supra* note 45, at 24.

89. This expectation with respect to price follows logically from the discussion so far about the likely impact of competitive entry. *See supra* Section IV.A.

90. *See* PINDYCK & RUBINFELD, *supra* note 4, at 49.

91. For example, the rules applied by the courts to measure compensatory damages, as discussed above, distinguish between lost profits based on the greater *quantity* of sales (i.e. “lost sales.” that would have been made “but for” infringement), *see* *Crystal Semiconductor Corp. v. Tritech Microelectronics Int’l, Inc.*, 246 F.3d 1336, 1353 (Fed. Cir. 2001), from lost profits based on price erosion, or “the *actual cost of goods* and the *potential price*—the price they could have realized had there been no competition from the infringers,” *see In re Mahurkar Double Lumen Hemodialysis Catheter Patent Litigation*, 831 F. Supp. 1354, 1386 (N.D. Ill. 1993).

competition, it is important to obtain *as much relevant data as possible*. Such data would ideally precede the infringing competition as well as go beyond it; it would also include prices of substitute goods as well as costs. At the very least, if the data are limited to the competing products prices, it would be critical to know prices before and after the onset of infringing competition.

Ideally, such data would extend back in time (well before the first infringement) and extend to the present. Data limited to a shorter and more recent time period, perhaps because of legal mandates, would make the analysis more difficult to undertake. For example, in a two firm market, the entry impact of the infringer on the market price would provide a key data point. If this infringement occurs before the legally mandated damages period, it would be preferable to have data including the commencement of infringement in order to draw a more reliable conclusion about price erosion. Longer periods of historical price observations can also result in more reliable controls for events apart from the infringement in question that may be affecting prices—such as prices of inputs, industry sales trends, and the general economy. Once this infringing competition begins, the market comes to a new equilibrium (which may or may not be stable), and it is the difference between this new equilibrium and the one prevailing before that constitutes the price erosion component of damages. Therefore, profit loss due to lower prices is an economic fact arising from competition, irrespective of a legal limitation on the period of time for which damages are recoverable.

C. Pre-Commencement Data on Prices Has a Significant Effect on the Amount of Price Erosion Damages

It is not uncommon that the patent holder was first to market and enjoys a large market share, if not an outright monopoly. In such a situation, a new and allegedly infringing competitor would typically begin with a smaller market share. This smaller market share would imply relatively modest lost sales at least initially, but it may imply a much larger negative impact on prices.⁹² Whether or not prices are affected depends upon the nature of the competition between the firms and the elasticity of demand;⁹³ the elasticity of demand informs the economist of the sensitivity of quantities bought and sold to

92. See F.M. SCHERER & DAVID ROSS, INDUSTRIAL MARKET STRUCTURE AND ECONOMIC PERFORMANCE 356-60 (3rd ed. 1990).

93. See PINDYCK & RUBINFELD, *supra* note 4, at 367.

changes in price.⁹⁴ Even if there is a modest impact on prices, the price erosion component of the competitive impact may be large because it affects not just *lost sales*, but *all of the sales* of the patent holder.⁹⁵ Again, one of the best ways of estimating this impact is to include the commencement of infringement in the analysis—even if that commencement preceded the legally mandated damages period.

V. THERE IS SPARSE AND POTENTIALLY CONFLICTING LEGAL AUTHORITY REGARDING THE USE OF PRE-COMMENCEMENT DATA ON PRICES

A brief examination of the respective roles of judge and jury demonstrates that it is the judge, not the jury, who decides whether to allow consideration of pre-notice economic harm.⁹⁶

With respect to price erosion, the jury is responsible for making findings of fact, including determining whether the infringing sales caused price erosion, and the amount of price erosion damages.⁹⁷ The jury's damage award, whether for damages generally or price erosion damages specifically, is not often overturned or modified on post-verdict review.⁹⁸ Where supported by substantial evidence, the jury's damage award must be upheld unless the amount is grossly excessive or based solely on speculation.⁹⁹ In assessing whether the jury's damage award is supported by substantial evidence, the evidence must be viewed in the light most favorable to the non-moving party (the patentee), and the non-movant must be given the benefit of all reasonable inferences.¹⁰⁰ Thus, the jury's verdict on the existence and

94. *Id.* at 34.

95. See *Ericsson, Inc. v. Harris Corp.*, 352 F.3d 1369, 1378 (Fed. Cir. 2003); Applegate, *supra* note 44, at 1380-81.

96. See *Minn. Mining & Mfg. Co. v. Johnson & Johnson Orthopaedics, Inc.*, 976 F.2d 1559, 1577 (Fed. Cir. 1992); *State Indus., Inc. v. Mor-Flo Indus., Inc.*, 883 F.2d 1573, 1576-77 (Fed. Cir. 1989) (“Deciding how much to award as damages is not an exact science, and the methodology of assessing and computing damages is committed to the sound discretion of the district court.”).

97. *Brooktree Corp. v. Advanced Micro Devices, Inc.*, 977 F.2d 1555, 1578 (Fed. Cir. 1992).

98. See Kimberly A. Moore, *Judges, Juries, and Patent Cases—An Empirical Peek Inside the Black Box*, 99 MICH. L. REV. 365, 397 (2000) (revealing that the Federal Circuit affirms jury fact findings in 78% of all jury issues appealed).

99. See *Ericsson, Inc. v. Harris Corp.*, 352 F.3d 1369, 1378 (Fed. Cir. 2003); *Crystal Semiconductor Corp. v. TriTech Microelectronics Int'l, Inc.*, 246 F.3d 1336, 1346 (Fed. Cir. 2001); *Brooktree*, 977 F.2d at 1580.

100. See *Ericsson*, 352 F.3d at 1373 (citing *Southwest Software, Inc. v. Harlequin, Inc.*, 226 F.3d 1280, 1289 (Fed. Cir. 2000)); *Hangarter v. Provident Life & Accident Ins. Co.*, 373 F.3d 998, 1005 (9th Cir. 2004) (“[C]redibility determinations, the weighing of the evidence, and

amount of price erosion damages must stand and should not be modified or overturned on review unless, upon evaluating the record in accordance with these principles, the court finds that no reasonable juror could have reached this verdict.¹⁰¹

In comparison, certain subsidiary decisions underlying a damage theory—such as choosing between reasonable alternative accounting methods for determining profit margin or adopting a reasonable way to determine the number of infringing units—are discretionary with the trial court and will not be overturned on appeal unless the trial court abused its discretion.¹⁰² Thus, the issue of whether to consider sales data pre-dating the accounting period likely falls within the district court’s discretion.

In *Power Integrations*,¹⁰³ the trial court excluded evidence of sales, financial data, or other conditions that pre-dated the damage period from the calculation of price erosion damages.¹⁰⁴ In reaching its decision, the court cited *Johnson Electric North America, Inc. v. Nabuchi Motor America Corp.*¹⁰⁵ for the proposition that damage calculations based on estimated price erosion occurring prior to the period of actual notice are invalid.¹⁰⁶ The *Power Integrations* court stated: “Specifically, the [Johnson] court concluded that the plaintiff could not calculate price erosion from the time the alleged infringer

the drawing of legitimate inferences from the facts are jury functions, not those of a judge.”) (quoting *Reeves v. Sanderson Plumbing Prods., Inc.*, 530 U.S. 133, 150 (2000)).

101. See FED. R. CIV. P. 50. A major reason for the high rate of affirmance of jury fact findings on things such as infringement and the amount of damage is this “deferential standard of review.” See Moore, *supra* note 98, at 400-01. Other contributing factors are the lack of transparency in jury findings, and the related inability of the trial court to mandate special verdicts such that, on appeal, the Federal Circuit has limited ability to identify and correct jury inadequacies. See Moore, *supra* note 98, at 400-01.

102. *Minn. Mining & Mfg. Co. v. Johnson & Johnson Orthopaedics, Inc.*, 976 F.2d 1559, 1577 (Fed. Cir. 1992); see also *State Indus., Inc. v. Mor-Flo Indus., Inc.*, 883 F.2d 1573, 1576-77 (Fed. Cir. 1989) (“Deciding how much to award as damages is not an exact science, and the methodology of assessing and computing damages is committed to the sound discretion of the district court.”).

103. *Power Integrations, Inc. v. Fairchild Semiconductor Int’l, Inc.*, C.A. No. 04-1371-JJF (D. Del. June 2, 2006).

104. Memorandum Order Document 265 at 1-3, *Power Integrations, Inc. v. Fairchild Semiconductor Int’l, Inc.*, C.A. No. 04-1371-JJF (D. Del. June 2, 2006) (order granting defendant’s motion for partial summary judgment precluding plaintiff’s recovery of damages prior to date of actual notice), *aff’d*, Memorandum Order Document 329 at 1, C.A. No. 04-1371-JJF (D. Del. Aug. 22, 2006) (order denying plaintiff’s motion to reconsider the court’s prior partial summary judgment order in favor of defendant).

105. *Johnson Electric N. Am., Inc. v. Nabuchi Motor Am. Corp.*, 103 F. Supp. 2d 268 (S.D.N.Y. 2000).

106. Memorandum Order Document 265 at 3-4, *Power Integrations*, C.A. No. 04-1371-JJF.

entered the market, because the market entry date preceded the date of compliance with the marking statute.”¹⁰⁷ Neither *Power Integrations* nor *Johnson* was appealed to the Federal Circuit. Thus, we do not have the benefit of the Federal Circuit’s review of these decisions.

In comparison, the district court, in *Vulcan Engineering Co., Inc. v. Fata Aluminum, Inc.*,¹⁰⁸ awarded patent infringement damages for price erosion based upon evidence of offers for sale made prior to the damage accounting period.¹⁰⁹ Thus, the scarce authority regarding whether to include pre-accounting period evidence for price erosion calculations is conflicting.

VI. THE CASE AGAINST ALLOWING PRE-COMMENCEMENT DATA ON PRICES TO BE USED IN CALCULATING PRICE EROSION DAMAGES

While infringing activities occurring prior to notice may very well cause erosion in prices of the patented article, one could reasonably argue that not all of this loss should be legally recoverable. In fact, this section focuses on the legal arguments that explain why post-notice damages resulting from pre-notice price erosion have not become commonplace. One argument is that the plain language of the statute seems, on its face, to deny *all* data prior to the date of notice.¹¹⁰ It certainly makes calculations easier when all data prior to notice is excluded for whatever reason. The sparse legal authority on this issue appears to exclude pre-notice data for at least this reason. A second argument is that while calculations of reasonable royalty often include a pre-notice time frame, the time frame for calculating actual damages (which include price erosion) does not necessarily need to follow suit. The premise of a reasonable royalty calculation logically requires looking at the time of a hypothetical negotiation between the patent owner and a prospective user.¹¹¹ The “legal fiction” of the reasonable royalty calculation thus requires looking back to a time frame before the infringer entered the market.¹¹² However, calculation of actual damages does not require looking back in order to prove that damage actually occurred. As the losses are ongoing, post-notice

107. *Id.*

108. *Vulcan Eng’g Co., Inc. v. Fata Aluminum, Inc.*, No. CIV.98-74495, 2002 WL 31008328 (E.D. Mich. Aug. 14, 2002), *aff’d*, No. 02-1623, 2003 WL 21479539 (Fed. Cir. 2003).

109. *See id.* at *3.

110. 35 U.S.C. § 287(a) (2006).

111. *Rite-Hite Corp. v. Kelley Co.*, 56 F.3d 1538, 1554 (Fed. Cir. 1995); *see also* *TWM Mfg. Co., v., Dura Corp.*, 789 F.2d 895, 898 (Fed. Cir. 1986).

112. *See Wang Labs., Inc. v. Toshiba Corp.*, 993 F.2d 858, 870 (Fed. Cir. 1993).

losses exist, and looking back at pre-notice loss is not required to find at least some loss. Perhaps excluding pre-notice loss creates an incentive for prompt notice. As such, a third argument is that, drawing a bright line rule creates a legal incentive to encourage prompt notice by the patent holder. One policy reason for requiring notice is to help avoid innocent infringement,¹¹³ so if a patent holder is economically motivated, he will likely inform an innocent infringer early. Thus, not looking back for price erosion calculations is an additional economic motivation for a patent owner to promptly notify an alleged infringer.

Two lower court cases have directly addressed whether pre-notice data should be included in price erosion calculations.¹¹⁴ Both of these courts determined that pre-notice data should not be considered.¹¹⁵ Thus, although the Federal Circuit has yet to weigh in on this issue, current legal precedent weighs in favor of excluding pre-notice data in price erosion calculations.

In 2000, the Southern District of New York held in *Johnson Electric* that “[the plaintiff] may not seek damages for any acts of infringement committed prior to [the date of notice] and to the extent that [the damages expert] based his damages computations on [the infringer’s] activities before that date, his conclusions are fatally flawed.”¹¹⁶ In 2006, the U.S. District Court of Delaware, in *Power Integrations*, also excluded pre-notice data in price erosion calculations based on the *Johnson Electric* decision.¹¹⁷ Specifically, in *Power Integrations*, the patent holder contended that the marking statute did not preclude the use of pre-notice sales data to calculate the rate of price erosion and that *Johnson Electric* was wrongly decided.¹¹⁸ As such, the patent holder brought a motion for the court to reconsider its order limiting damages calculations to conditions occurring on or after the notice date.¹¹⁹ However, the court denied their motion, finding that *Johnson Electric* was, at least, not a clearly erroneous decision.¹²⁰

113. Nike, Inc. v. Wal-Mart Stores, Inc., 138 F.3d 1437, 1443 (Fed. Cir. 1998) (citations omitted).

114. Johnson Elec. N. Am. Inc. v. Mabuchi Motor Am. Corp., 103 F. Supp. 2d 268, 280 (S.D.N.Y. 2000); Power Integrations, Inc. v. Fairchild Semiconductor Int’l, Inc., 2006 WL 2435084, at *1 (D. Del. Aug. 22, 2006).

115. *Johnson*, 103 F. Supp. 2d at 280; *Power Integrations*, 2006 WL 2435084, at *2.

116. *Johnson*, 103 F. Supp. 2d at 280.

117. *Power Integrations*, 2006 WL 2435084, at *2.

118. *Id.* at *1.

119. *Id.*

120. *Id.* at *2.

One reason apparently relied upon by the courts for excluding pre-notice data in price erosion calculations is the plain language of the damages statute itself. Specifically, 35 U.S.C. § 287(a) states:

In the event of failure so to mark, no damages shall be recovered by the patentee in any action for infringement, except on proof that the infringer was notified of the infringement and continued to infringe thereafter, in which event damages may be recovered only for infringement occurring after such notice.¹²¹

This language clearly states that damages cannot be recovered for infringement occurring prior to notice. Therefore, since price erosion is one measurement of damages, any data regarding infringing activity occurring prior to notice also cannot be considered. The *Johnson Electric* court seemed to use this reasoning when it stated: “Price erosion is merely one measure of damages and thus, to the extent it occurred prior to compliance with the patent marking statute, cannot be considered.”¹²²

Some courts have stated that the statute bars recovery of *all* damages, no matter what type of calculation is used.¹²³ For example, the *Nike*¹²⁴ court stated: “The statutory history establishes that the marking requirement has always applied, and continues to apply, to both recovery of the infringer’s profit under § 289, and recovery of damages, *however measured*, under § 284.”¹²⁵ This would, therefore, necessarily include price erosion-based damages. In fact, the *Johnson* court specifically states: “[the patent holder] cannot recover *any* damages, including those for price erosion, for the acts committed

121. 35 U.S.C. § 287(a) (2006). Section 287(a) states in full:

Patentees, and persons making, offering for sale, or selling within the United States any patented article for or under them, or importing any patented article into the United States, may give notice to the public that the same is patented, either by fixing thereon the word “patent” or the abbreviation “pat.,” together with the number of the patent, or when, from the character of the article, this cannot be done, by fixing to it, or to the package wherein one or more of them is contained, a label containing a like notice. In the event of failure so to mark, no damages shall be recovered by the patentee in any action for infringement, except on proof that the infringer was notified of the infringement and continued to infringe thereafter, in which event damages may be recovered only for infringement occurring after such notice. Filing of an action for infringement shall constitute such notice.

122. *Johnson Elec. N. Am. Inc. v. Mabuchi Motor Am. Corp.*, 103 F. Supp. 2d 268, 281 (S.D.N.Y. 2000).

123. *See, e.g., Nike, Inc. v. Wal-Mart Stores, Inc.*, 138 F.3d 1437, 1440 (Fed. Cir. 1998); *Johnson*, 103 F. Supp. 2d at 280-81.

124. *Nike, Inc. v. Wal-Mart Stores, Inc.*, 138 F.3d 1437 (Fed. Cir. 1998).

125. *Id.* at 1440 (emphasis added).

prior to [the date of notice].”¹²⁶ Thus, it seems that there is support in the case law for excluding price-erosion data prior to notice.

While there is ample support for looking prior to notice for reasonable royalty calculations, there is little or no support for doing so for price erosion calculations. The distinction between the two is reasonable given their differing purposes. Price erosion is a type of lost profit calculation—which comes from a “but for” analysis—and is a measure of *actual* damages caused by infringement.¹²⁷ In contrast, the reasonable royalty measure of damages is merely a “legal fiction.”¹²⁸ It is a last resort (floor) that patentees are allowed when they are unable to sufficiently prove any actual damages.¹²⁹ The reasonable royalty is intended to be the amount “which a person, desiring to manufacture and sell a patented article, as a business proposition, would be willing to pay as a royalty.”¹³⁰ Thus, the negotiation must be assumed to be “between the patent owner and the prospective [user].”¹³¹ As such, “[t]he key element in setting a reasonable royalty . . . is the necessity for return to the date when the infringement began.”¹³²

On the other hand, *actual damages*—which include price erosion—must be proven as the *actual loss* suffered by the patent holder as a “but for” result of the infringement.¹³³ As stated above, the amount of damages recoverable is limited by statute to those incurred after notice is given.¹³⁴ Pre-notice price erosion calculations assume that prices erode as soon as the competing infringing product enters the market. Thus, the premise is that the baseline as of the date of notice is lower than it would have been absent infringement. In other words, in order to recover, the patent holder has to prove that pre-notice infringement actually caused prices to erode during the pre-notice time frame. Therefore, allowing proof of pre-notice price erosion

126. *Johnson*, 103 F. Supp. 2d at 281.

127. *Ericsson, Inc. v. Harris Corp.*, 352 F.3d 1369, 1378 (Fed. Cir. 2003) (citing *BIC Leisure Prods., Inc. v. Windsurfing Int’l, Inc.*, 1 F.3d 1214, 1220 (Fed. Cir. 1993)).

128. *Panduit Corp v. Stahlin Bros. Fibre Works, Inc.*, 575 F.2d 1152, 1159 (6th Cir. 1978).

129. *See Del Mar Avionics, Inc. v. Quinton Instrument Co.*, 836 F.2d 1320, 1326 (Fed. Cir. 1987).

130. *Panduit Corp.*, 575 F.2d at 1157-58 (quoting *Goodyear Tire & Rubber Co. v. Overman Cushion Tire Co.*, 95 F.2d 978, 984 (6th Cir. 1973)).

131. *Hanson v. Alpine Valley Ski Area, Inc.*, 718 F.2d 1075, 1079 (Fed. Cir. 1983).

132. *Wang Labs., Inc. v. Toshiba Corp.*, 993 F.2d 858, 870 (Fed. Cir. 1993) (quoting *Panduit Corp.*, 575 F.2d at 1158).

133. *Ericsson, Inc., v. Harris Corp.*, 352 F.3d 1369, 1378 (Fed. Cir. 2003) (citing *BIC Leisure Prods., Inc. v. Windsurfing Int’l, Inc.*, 1 F.3d 1214, 1220 (Fed. Cir. 1993)).

134. 35 U.S.C. § 287(a) (2006).

takes into account a loss that was incurred during the pre-notice timeframe, which is precisely what the marking statute forbids. As such, it is logical to limit the data used in a price erosion calculation to events occurring only after notice, while still using a pre-notice time frame for reasonable royalty calculations.

Finally, the policy considerations weigh in favor of not allowing pre-notice data. The marking statute serves three related purposes: “1) helping to avoid innocent infringement; 2) encouraging patentees to give notice to the public that the article is patented; and 3) aiding the public to identify whether an article is patented.”¹³⁵ In order to further these purposes, Congress structured the marking statute so as to tie failure to mark with the inability to collect damages prior to notice.¹³⁶ These purposes strongly encourage patent owners to mark their products and promptly notify infringers if the product is not marked. It is in the best interest of society for companies to not spend the development and manufacturing costs on a product that they are not allowed to make. It is a waste of resources that the company could have used to make another product. It seems only fair that if the patent owner has an exclusive right to make and sell a particular item, the patent owner also has the responsibility to promptly notify infringers before unnecessary resources are wasted in the second company’s production of the patented product. A company that allows unnecessary expenditures by the second company should, at the very least, be unable to recover damages during its time of inattention and carelessness.

For at least the reasons stated above, it may be legally reasonable to disallow pre-notice data when calculating price erosion damages. The admittedly sparse legal authority indicates that pre-notice data should not be used. Although the rationale provided in these cases is limited, there are a several reasons for limiting such data. First, the statute states that “damages may be recovered only for infringement occurring after notice,” and as such, all pre-notice data should similarly be excluded. Second, although damages under a reasonable royalty calculation look to infringing activities occurring prior to notice, this is due to a special “legal fiction” floor calculation that is

135. Nike, Inc., v. Wal-Mart Stores, Inc., 138 F.3d 1437, 1443 (Fed. Cir. 1998) (citations omitted).

136. Am. Med. Sys., Inc., v. Med. Eng’g Corp., 6 F.3d 1523, 1537 (Fed. Cir. 1993) (“Congress structured the statute so as to tie failure to mark with disability to collect damages . . . Furthermore, allowing recovery of damages from the point of full compliance with the marking statute furthers the policy of encouraging marking to provide notice to the public . . .”).

not necessary for price erosion damages. Finally, limiting price erosion recovery in this way creates an additional economic incentive for patent holders to provide early notice to infringers.

VII. THE CASE FOR ALLOWING PRE-COMMENCEMENT DATA ON PRICES TO BE USED IN CALCULATING PRICE EROSION DAMAGES

Although case authority on this issue is sparse, at least one District Court has allowed evidence of prices prior to the accounting period to be used for calculating price erosion damages. In *Vulcan Engineering Co. v. Fata Aluminum, Inc.*,¹³⁷ the patent holder's damage expert was allowed to base his calculation of price erosion damages on offers for sale made before the patent holder gave the infringer actual notice of infringement.¹³⁸ The plaintiff held a patent on a casting line system used in the manufacture of automobiles and found itself bidding against a competing system offered by the defendant.¹³⁹ The competition from the defendant forced the plaintiff to lower its bids.¹⁴⁰ During the bidding process, the plaintiff believed that the defendant's competing system necessarily infringed plaintiff's patent, prompting the plaintiff to notify the customer of its suspicions.¹⁴¹ The customer forwarded the plaintiff's belief on to the defendant, and the defendant, nonetheless, proceeded to sell an infringing system to the customer.¹⁴² Following remand from appeal, the District Court awarded plaintiff lost profits on the lost sale to the defendant as well as price erosion damages on both the lost sales to the defendant and other sales made by plaintiff.¹⁴³ The price erosion damages were based on the District Court's finding that the infringing competition forced plaintiff to lower its prices and that this would not have been necessary "but for" the infringement.¹⁴⁴ The sole evidence relied upon by the District Court in calculating the amount of price erosion damages was that, prior to notice, plaintiff lowered the price

137. *Vulcan Eng'g Co. v. Fata Aluminum, Inc.*, No. CIV.98-74495, 2002 WL 31008328, at *3 (E.D. Mich. Aug. 14, 2002), *aff'd*, No. 02-1623, 2003 WL 21479539, at **1 (Fed. Cir. 2003).

138. *Id.*

139. *Vulcan Eng'g Co., Inc. v. Fata Aluminum, Inc.*, 278 F.3d 1366, 1371 (Fed. Cir. 2002).

140. *Id.* at 1377 n.2.

141. *Id.* at 1371.

142. *Id.*

143. *Vulcan Eng'g Co., Inc. v. Fata Aluminum, Inc.*, No. CIV.98-74495, 2002 WL 31008328 (E.D. Mich. Aug. 14, 2002), *aff'd*, No. 02-1623, 2003 WL 21479539, at **1 (Fed. Cir. 2003).

144. *Id.* at *2.

of its casting system line in response to defendant's infringing conduct.¹⁴⁵

On appeal, the defendant challenged the award of price erosion damages on the grounds that the marking statute barred such damages "based on the effects of pre-notice infringing offers,"¹⁴⁶ and that the marking statute "does [not] define any circumstances under which recoverable damages can derive from a pre-notice act of infringement."¹⁴⁷ The defendant's arguments apparently fell on deaf ears as the Federal Circuit affirmed the District Court's award in an unpublished per curiam decision.¹⁴⁸

Implicit in *Vulcan* is the recognition that whatever the damages accounting period, the patentee is entitled to recover the *full* measure of damages suffered during this period.¹⁴⁹ Refusing to allow consideration of pre-notice prices in the course of calculating the recovery for post-notice infringement contravenes the strong policies favoring full compensation of the injured patentee.¹⁵⁰

Furthermore, the plain language of the marking statute precludes only the *recovery* of damages on pre-notice infringing activities. The statute states in pertinent part:

In the event of failure to so mark, no damages shall be recovered . . . except on proof that the infringer was notified of the infringement and continued to infringe thereafter, *in which event damages may be recovered only for infringement occurring after such notice.*¹⁵¹

The marking statute does not address the manner in which the cause or amount of damages may be proven.¹⁵² It does not address the

145. *Id.*

146. Brief of Defendants-Appellants at 11, *Vulcan Eng'g Co., Inc. v. Fata Aluminum, Inc.*, No. 02-1623 (Fed. Cir. Nov. 25, 2002).

147. *Id.* at 13.

148. *Vulcan Eng'g Co., Inc. v. Fata Aluminum, Inc.*, No. 02-1623, 2003 WL 21479539, at **1 (Fed. Cir. June 20, 2003).

149. *Gen. Motors Corp. v. Devex Corp.*, 461 U.S. 648, 654-55 (1982) (noting that while enacting § 284, "Congress sought to ensure that the patent owner would in fact receive full compensation for 'any damages' he suffered a result of the infringement"); *Rite-Hite Corp. v. Kelley Co.*, 56 F.3d 1538, 1544-48 (Fed. Cir. 1995) (accepting the patentees argument that "[a] patentee . . . is entitled to all the profits it would have made . . . 'but for' the infringement"); see also S. REP. NO. 79-1503, at 1387 (1946) (stating that § 284 was intended to allow recovery of "any damages the complainant can prove" (emphasis added)).

150. See *Gen. Motors Corp.*, 461 U.S. at 654-55; *Rite-Hite Corp.*, 56 F.3d at 1544-45; S. Rep. No. 79-1503 at 1387.

151. 35 U.S.C. § 287 (2006) (emphasis added).

152. See *id.*

method or measurement used to calculate post-notice damages.¹⁵³ The decisions in *Johnson Electric* and its progeny, *Power Integrations*, exhibit the fundamental flaw of failing to recognize the difference between the *infringing activities* for which damages are recoverable under the marking statute, on the one hand, and the *evidence or methods* that may be used to calculate these damages, on the other. Like the unsuccessful defendant in *Vulcan Engineering*, the District Courts in *Johnson Electric* and *Power Integrations* erroneously characterize the damage expert's consideration of pre-notice prices—in connection with calculating price erosion damages on post-notice infringing activity—as seeking to recover damages on infringing activity that occurred before notice was given.¹⁵⁴ These are not the same thing. The marking statute applies only to one of them (limiting the infringing activity on which damages may be recovered), but not the other (determining the evidence or methods used to calculate the damages on these infringing activities).

There is no disputing the rule that damages are limited to infringing activity occurring after notice has been received by the accused infringer. However, it does not follow from the plain language of the statute that the evidence relevant to the proper calculation of these post-notice damages is itself limited to post-notice conditions.

To the contrary, the Federal Circuit has recognized that the development of the complete evidentiary record on price erosion damages may require consideration of pricing and price levels that pre-date not just notice, but also the entry of the infringing product into the marketplace.¹⁵⁵ There also is no difference between using pre-notice data to calculate price erosion and the Federal Circuit's well-established rule that the determination of a reasonable royalty (on sales made by the infringer during the accounting period) is based on a hypothetical negotiation between the patent holder and the infringer occurring when the infringing sales first began.¹⁵⁶ The hypothetical

153. *See id.*

154. *Johnson Elec. N. Am., Inc. v. Mabuchi Motor Am. Corp.*, 103 F. Supp. 2d 268, 280-81 (S.D.N.Y. 2000); *Power Integrations, Inc. v. Fairchild Semiconductor Int'l, Inc.*, No. C.A. 04-1371-JJF, 2006 WL 2435084, at *1-2 (D. Del. Aug. 22, 2006).

155. *See Crystal Semiconductor Corp. v. TriTech Microelectronics Int'l, Inc.*, 246 F.3d 1336, 1359 (Fed. Cir. 2001) (finding damages expert used an improper benchmark, but noting that pre-infringement pricing data can support a lost profits analysis) (citing *Minn. Mining & Mfg. Co. v. Johnson & Johnson Orthopaedics, Inc.*, 976 F.2d 1559, 1579 (Fed. Cir. 1992); *Brooktree Corp. v. Advanced Micro Devices, Inc.*, 977 F.2d 1555, 1579-80 (Fed. Cir. 1992)).

156. *Rite-Hite Corp. v. Kelley Co.*, 56 F.3d 1538, 1554 (Fed. Cir. 1995) (stating specifically that the hypothetical negotiation occurs at the time infringement began); *see also*

negotiation requires the parties to reconstruct, as of the time the infringement first began, the royalty rate the patent holder and the infringer would have agreed upon assuming they were willing participants in the negotiation.¹⁵⁷ The courts have identified numerous factors as relevant to reconstructing the parties' respective negotiation positions, encompassing among other things the parties' experience in licensing any related technology, the parties' commercial relationship, the profitability and commercial success of the technology, and the utility and technical advances of the technology over what came before.¹⁵⁸ Since the hypothetical negotiation is placed at the date infringement begins, in many if not most instances, the evidence relevant to determining the outcome of the negotiation will come from documents and events that come well before any actual or constructive notice under the marking statute. Notwithstanding that the evidence falls outside the accounting period defined by the marking statute, the Federal Circuit deems it admissible on the question of the amount of reasonable royalty damages.¹⁵⁹ In *Wang Laboratories, Inc.*,¹⁶⁰ the Federal Circuit reversed the District Court's ruling that the date of the hypothetical negotiation could not be earlier than the date of actual notice, and explained:

It is true that limitations may apply to the period for which damages may be recovered. As in the present case, failure to mark patented goods is a limitation on recovery of damages in the absence of notice. 35 U.S.C. § 287 (1988). However, the court confused limitations on damages due to lack of notice with determination of the time when damages first began to accrue, and it is the latter which is controlling in a hypothetical royalty negotiation.¹⁶¹

The Federal Circuit recognized, in *Wang Laboratories* that, although the economic harm resulting from patent infringement may

Riles v. Shell Exploration & Prod. Co., 298 F.3d 1302, 1311 (Fed. Cir. 2002) (noting a reasonable royalty should be determined at a time before the infringement began) (citing *Hanson v. Alpine Valley Ski Area, Inc.*, 718 F.2d 1075, 1078 (Fed. Cir. 1983); *TWM Mfg. Co. v. Dura Corp.*, 789 F.2d 895, 901 (Fed. Cir. 1986) (focusing on the date infringement began for hypothetical negotiations, and noting that actual profits of the infringer after the date of a hypothetical negotiation is admissible as evidence as to what royalty rate a reasonable prospective licensee might have agreed to)).

157. *Rite-Hite*, 56 F.3d at 1554.

158. *Georgia-Pacific Corp. v. U.S. Plywood Corp.*, 318 F. Supp. 1116, 1120 (S.D.N.Y. 1970).

159. *See Wang Labs., Inc. v. Toshiba Corp.*, 993 F.2d 858, 870 (Fed. Cir. 1993).

160. *Wang Labs., Inc. v. Toshiba Corp.*, 993 F.2d 858, 870 (Fed. Cir. 1993).

161. *Id.* at 870.

accrue before the accounting period, the consideration of this harm is nonetheless admissible in calculating damages on infringing activity that falls within the accounting period.¹⁶²

Likewise, as discussed above, economic harm from eroded prices first begins to accrue with the entry of the infringing products into the marketplace. Therefore, in many or most instances, such harm will pre-date any actual or constructive notice that defines the beginning of the accounting period.¹⁶³ As in *Wang Laboratories*, and no different from the calculation of reasonable royalty damages, the pre-notice evidence of this economic harm should be admissible for purposes of determining the eroded prices suffered by the patent holder on either its own sales—or the diverted sales made by the infringer—that were made during the accounting period.

The countervailing cases have no answer for why the admissibility of a pre-notice hypothetical negotiation of a reasonable royalty does not also compel the admissibility of pre-notice price erosion. *Johnson Electric* does not address the issue.¹⁶⁴ The court in *Power Integrations* may have found persuasive the argument made by the accused infringer in its written brief to the court that reasonable royalty damages are based on a legal fiction and are designed to provide a minimum recovery in the event that actual damages in the form of lost profits are not available.¹⁶⁵ However, the purported distinction is not compelling. Both lost profits due to price erosion and reasonable royalty are well-recognized elements of patent infringement damages, and both elements—not just reasonable royalty—require the reconstruction of a hypothetical market to show what would have happened “but for” the infringing conduct. With respect to reasonable royalty damages, the fiction is the royalty that the parties would have agreed upon prior to any infringing conduct.¹⁶⁶ With respect to price erosion, the fiction is the price or prices that the

162. *See id.*

163. *See supra*, Section I.

164. *See generally* *Johnson Elec. N. Am., Inc. v. Mabuchi Motor Am. Corp.*, 103 F. Supp. 2d 268 (S.D.N.Y. 2000); *see also* Memorandum Order Document Number 265 at 5, *Power Integrations, Inc. v. Fairchild Semiconductor Int’l, Inc.*, C.A. No. 04-1371-JJF (D. Del. June 2, 2006) (distinguishing *Wang Labs.* as “focused on reasonable royalty which is not the issue here”), *aff’d*, Memorandum Order Document Number 329 C.A. No. 04-1371-JJF (D. Del. Aug. 22, 2006).

165. *See* Reply Brief in Support of Defendants Motion for Summary Judgment of Limitation of Damages Under 35 U.S.C. § 287 (Failure to Mark) at 6-7, *Power Integrations, Inc. v. Fairchild Semiconductor Int’l, Inc.*, No. 04-1371-JJF (Fed. Cir. Apr. 19, 2006).

166. *Wang Labs., Inc. v. Toshiba Corp.*, 993 F.2d 858, 870 (Fed. Cir. 1993).

patent holder would have been able to charge in the absence of the infringing conduct.¹⁶⁷

Proponents of a rule that bars damage experts from relying upon evidence of eroded prices may be concerned that to hold otherwise reduces the patent holder's incentive to provide timely notice under the marking statute. If the patent holder knew that it could delay giving notice without forfeiting consideration of pre-notice price erosion, the patent holder would indeed delay giving notice—or so goes the argument. However, while it is true that the marking statute's limitation on recoverable damages is intended to create economic incentives for giving timely notice,¹⁶⁸ these incentives remain strong even if pre-notice evidence of reduced prices is used to calculate price erosion damages. The patent holder still has a strong incentive to provide timely notice because the longer it waits to give notice, the fewer the number of infringing sales taken into account in calculating patent infringement damages. In addition, if the patent holder delays giving notice, the greater the likelihood that damages are limited or even barred due to laches or estoppel.¹⁶⁹ By providing prompt notice, the patent holder also increases the likelihood that the infringer will be found to have acted in an objectively reckless fashion, thereby increasing the likelihood of recovering enhanced damages.¹⁷⁰ In addition, the patent holder knows that the sooner it contacts the infringer, the sooner the parties can negotiate a license that will generate revenue for the patent holder.

Furthermore, allowing consideration of pre-notice evidence of eroded prices does not excuse the patent holder from having to meet the usual, stringent burdens of proof applicable to patent infringement damages.¹⁷¹ The patent holder must provide expert testimony on the alleged price erosion that is qualified, reliable, and relevant within the meaning of the Federal Rules of Evidence, and specifically Rule 702.¹⁷² Price erosion damages cannot be based on mere speculation

167. See *Water Techs. Corp. v. Calco, Ltd.*, 850 F.2d 660, 671 (Fed. Cir. 1988).

168. See *Nike, Inc. v. Wal-Mart Stores, Inc.*, 138 F.3d 1437, 1443 (Fed. Cir. 1998).

169. See 35 U.S.C. § 282 (2006); *Crown Packaging Tech., Inc. v. Rexam Beverage Can Co.*, 498 F. Supp. 2d 718, 725 (D. Del. 2007).

170. See *In re Seagate Tech., LLC*, 497 F.3d 1360, 1371 (Fed. Cir. 2007) (en banc).

171. See *Micro Chem., Inc. v. Lextron, Inc.*, 318 F.3d 1119, 1122 (Fed. Cir. 2003); see also *Story Parchment Co. v. Paterson Parchment Paper Co.*, 282 U.S. 555, 563 (1931); see also N.D. Cal. Model Patent Jury Instr. B.5.1 (Nov. 29, 2007) (“While [patent holder] is not required to prove its damages with mathematical precision, it must prove them with reasonable certainty. [Patent holder] is not entitled to damages that are remote or speculative.”).

172. FED. R. EVID. 702. This rule states:

and conjecture.¹⁷³ Moreover, while the patent holder is not required to know, at the time it lowered its prices, that the competitor was offering an infringing product, it must still establish by a preponderance of the evidence the amount of the price reduction, and that the price was reduced as a result of the competing product.¹⁷⁴ In short, there are ample checks built into existing evidentiary rules and burdens of proof to protect against unduly high, speculative, or otherwise unfounded awards of price erosion damages. If the patent holder's damage expert relies upon pre-notice evidence of eroded prices to calculate price erosion damages, and if this evidence survives the evidentiary screens for speculative or unreliable evidence, and if the fact finder ultimately awards price erosion damages in a specific amount, there is a high level of confidence that this award is necessary to provide full compensation to the patent holder for harm suffered as result of the infringing conduct.

If scientific, technical, or other specialized knowledge will assist the trier of fact to understand the evidence or to determine a fact in issue, a witness qualified as an expert by knowledge, skill, experience, training, or education, may testify thereto in the form of an opinion or otherwise, if (1) the testimony is based upon sufficient facts or data, (2) the testimony is the product of reliable principles and methods, and (3) the witness has applied the principles and methods reliably to the facts of the case.

To be admissible, expert testimony on price erosion damages must meet the requirements of Rule 702. *Ericsson, Inc. v. Harris Corp.*, No. 4:98cv325, 2001 WL 36131932, at *2-3 (E.D. Tex. Mar. 13, 2001). The trial judge must determine whether a designated witness is qualified to give the expert opinion he seeks to express. *Kumho Tire Co. v. Carmichael*, 526 U.S. 137, 156 (1999); *Daubert v. Merrell Dow Pharm., Inc.*, 509 U.S. 579, 589 (1993). The burden is on the party offering the expert testimony to establish by a preponderance of the evidence that it is reliable. *Moore v. Ashland Chem. Inc.*, 151 F.3d 269, 276 (5th Cir. 1998) (en banc). The party offering the challenged expert opinions need not, however, prove "that the expert's testimony is correct." *Moore*, 151 F.3d at 276. The district court must also make a "preliminary assessment of whether the reasoning or methodology underlying the testimony is scientifically valid [(the reliability criterion)] and of whether the reasoning or methodology can be applied to the facts at issue [(the relevance analysis)]." *Skidmore v. Precision Printing & Packaging, Inc.*, 188 F.3d 606, 617 (5th Cir. 1999) (quoting *Daubert*, 509 U.S. at 592-93). The district court's responsibility is "to make certain that an expert, whether basing testimony upon professional studies or personal experience, employs in the courtroom the same level of intellectual rigor that characterizes the practice of an expert in the relevant field." *Kumho Tire*, 526 U.S. at 152. The court "must ensure the expert uses reliable methods to reach his opinions; and those opinions must be relevant to the facts of the case." *Guy v. Crown Equip. Corp.*, 394 F.3d 320, 325 (5th Cir. 2004).

173. See *Grain Processing Corp. v. Am. Maize-Prods. Co.*, 185 F.3d 1341, 1350 (Fed. Cir. 1999).

174. See *Brooktree Corp. v. Advanced Micro Devices, Inc.*, 977 F.2d 1555, 1580 (Fed. Cir. 1992); see also *Lam, Inc. v. Johns-Manville Corp.*, 718 F.2d 1056, 1065 (Fed. Cir. 1983) (stating that for price erosion damages, the patentee must show that, but for the infringement, it would have been able to charge and receive a higher price).

VIII. CONCLUSION

There is sparse and conflicting law regarding whether or not to include pre-notice data in proving post-notice price erosion damages. Although the law is unclear, economic theory requires that as much relevant data as possible be used to calculate the impact of a competitor in the market. Arguments for excluding this data revolve around providing an increased incentive for early notice. Arguments for including this data revolve around providing “full” post-notice economic recovery. While both arguments have legally compelling aspects, this is not merely an “academic” issue or an area of minutia for “damages attorneys.” The difference between the two ways of calculating changes the resulting total damage award by as much as tens of millions of dollars. As such, in many cases, the un-solved question of whether pre-notice data should be used in post-notice price erosion calculation will have a significant impact on the total damages awarded.