

**LOST PROFITS DAMAGES:
PRINCIPLES, METHODS, AND APPLICATIONS**

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CHAPTER 4

EX ANTE VERSUS EX POST

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Introduction

Lost profits damages generally commence on or about the date of the legal violation¹ by defendant. However, as often happens, the trial may be conducted many years later. In assessing damages, an expert may have a choice. An expert may measure the lost profits damages using information reasonably available on or about the date of the wrongdoing. Alternatively, the expert may obtain and evaluate all information reasonably available up through the date of the trial, including any new information that becomes available after the date of defendant's legal violation and through the time the expert prepares the damages study. This chapter examines the differences between these two approaches.

The amount of lost profits damages may be affected materially by whether the expert considers and applies only information available through the date of the legal violation or all information available through the date of trial. The two alternative methodologies and the respective scopes of information to be utilized by the expert in analyzing lost profits damages often are referred to as the *ex ante* and *ex post* approaches. The expert's selection of or agreement to use an *ex ante* or *ex post* approach may be influenced by considerations such as the following:

- *The case law*: The applicable case law for the relevant legal jurisdiction, as assessed by the attorney-client and communicated to the expert, may be guiding. The attorney-client may evaluate the relevant court's apparent predisposition to accept damages computed based upon one or the other approach, considering the nature of the case and related case facts.
- *The case facts*: The facts as disclosed through the litigation process or as independently discovered by the expert may influence the expert's decision about whether an *ex ante* or *ex post* approach is more appropriate.
- *The expert's view*: The expert's professional views about whether the *ex ante* or *ex post* approach results in the more appropriate determination of plaintiff's losses, based upon the expert's training in and experience with the economic, financial, and accounting disciplines, and taking into consideration prior testimony, may be relevant.

¹ For convenience and brevity, this chapter may use phrases such as the "legal violation" or the "wrongdoing" to identify an action giving rise to damages. However, a subject action may not *per se* be illegal or wrong, such as breach of a contract for which the contract or the law provides economic or other remedies.

For the last few decades, damages experts have debated heatedly whether the *ex ante* or *ex post* approach is the more conceptually defensible method to determine the economic value of plaintiff's losses. Chapter 2, "Legal Principles for Lost Profits Damages and Related Expert Testimony," discusses the legal types of damages awards for lost profits, including *compensatory damages*. The legal objective for a lost profits damages award is to make plaintiff² economically "whole." In other words, the purpose of the damages award is to return the injured party to the same or an equivalent economic position plaintiff would have experienced had the violation not occurred (i.e., but for the violation). Setting aside the influence of case law, experts disagree whether the *ex ante* or *ex post* approach is the theoretically better measure of lost profits suffered by plaintiff or whether the answer is the same under all circumstances.

The purpose of this chapter is to educate the reader about the *ex ante* and *ex post* methods, including the respective collections of information to be considered or relied upon, to determine the amount of lost profits damages. It is not the aim of this chapter to resolve the continuing disagreement among damages experts about the theoretically better approach. Instead, Chapter 5, "Business Valuation Methodology," and Chapter 6, "Contrasting the Lost Business Value and Lost Profits Methodologies," explore the comparative merits and disadvantages of the *ex ante* and *ex post* approaches. For convenience, these approaches are also referred to as the *business valuation* and *lost profits* methodologies, respectively, given the typical sets of information (i.e., *ex ante* or *ex post*) used for each methodology.³

This chapter is presented in two major parts. The first portion of the chapter defines the concepts of *ex ante* and *ex post*; explores the nature and importance of information used by the alternative approaches in the computation of lost profits damages; summarizes the development of case law reflecting courts' views on the use of either or both approaches; and presents the theoretical descriptions of the two approaches, as expressed in certain seminal journal articles. The second portion of the chapter includes a case study that illustrates application of the *ex ante* and *ex post* methodologies and the potential impact upon the damages amount determined through the time of trial.⁴ In particular, the illustrations examine the impact of the selection of methodology on the amount of total damages, including the calculation of prejudgment interest on past damages and the calculation of discounted future damages. These illustrations should help the reader understand the practical application of the *ex ante* and *ex post* methodologies and any potential resulting difference between the total damages amounts.

The Terms *Ex Ante* and *Ex Post*

The term *ex ante* is Latin for "from before" and in context means from before the event. The term *ex post* is Latin for "from after" and denotes from after the event. Gunnar Myrdal, a Swedish economist, has been credited with popularizing the terms in relation to prospective (compared to retrospective), economic, and financial analyses. In the non-litigation business world, for example, projected business revenues or labor requirements constitute an *ex ante* undertaking because estimated future results are formulated before the actual results are known. On the other hand, the passage of time will reveal the actual business revenue stream and labor levels, which then (as historical data) can be reported with precision and accuracy. As such, the projected perfor-

2 The term *plaintiff* in this chapter broadly refers to parties making claims for losses arising out of alleged wrongful conduct caused by others, and includes *claimants* in alternative dispute resolutions.

3 This general characterization is subject to exceptions. For example, a *hybrid* method might compute lost profits based upon *ex ante* information.

4 The actual date that plaintiff finally receives any monetary compensation may follow the date of an expert's calculation, the date of the initial trial, or the date the final decision-maker determines the total amount due to plaintiff if an appeal is pursued. For convenience, this chapter will assume that the total award amount is determined and received by the injured party as of the date of trial.

mance can be corrected to actual results on an *ex post* basis because the analysis is performed after the occurrence of the actual events. In 1939, Myrdal defined the terms as follows:

Quantities defined in terms of measurements made at the end of the period in question are referred to as *ex post*; quantities defined in terms of action planned at the beginning of the period in question are referred to as *ex ante*.⁵

The terms *ex ante* and *ex post* also are applied in the litigation arena and appear in court decisions with respect to the basis by which lost profits damages are determined. An *ex ante* damages analysis measures plaintiff's loss as of or about the time of the economic injury that was purportedly caused by defendant's wrongdoing. The *ex ante* damages study is based upon the information reasonably known or ascertainable on or about the date of the legal violation, including any contemporaneously projected but-for performance of plaintiff's business. For the purpose of computing the *ex ante* lost profits damages, information that arose after the *ex ante* valuation date is not incorporated into the expert's damages computation.

An *ex post* damages analysis measures plaintiff's economic loss at a later date, often as near as practical to the expected date of the damages award; the expert's damages analysis considers or relies upon information reasonably available as of the date the damages computations are completed.⁶ Because time has expired between the date of the defendant's legal violation and the date of the damages computation by the expert (i.e., the past damages or past lost profits period), many, if not all, of the *ex ante* but-for projections for the past damages period may be subject to refinement, adjustment, or correction, based upon new information arising after the date of the legal violation. Further, the more current *ex post* information may lead to improved projections or forecasts about the but-for performance for the estimated remaining future years of damages (i.e., future damages or future lost profits period) than could have been prepared based upon the older, *ex ante* information.

Dunbar et al. provide a useful framework for defining information considered in *ex ante* and *ex post* damage analyses:

A pure *ex ante* analysis would use information only if it were available at the time of the unlawful act to calculate the damages incurred at the time of the act. Practitioners base the analysis, therefore, as though they were to analyze the damage caused by the act contemporaneously with the occurrence of the act.

A pure *ex post* analysis uses all the information available up to the date of the analysis. Such an outcome-based analysis accounts for facts that become known after the unlawful act.⁷

Again, regardless of arguments about whether the *ex ante* or *ex post* method is preferable with respect to the attendant information used to compute damages, experts still disagree about which approach is the better theoretical measure of plaintiff's economic loss, and court decisions do not consistently endorse one methodology over the other.

⁵ Gunnar Myrdal, *Monetary Equilibrium* (London: W. Hodge, 1939), pp. 46–47.

⁶ Ideally, the damages amount should be computed as of the date plaintiff will actually receive the monetary award, which often is delayed for some time after the trial. Since the actual loss recovery date may be uncertain, the expert typically computes the damages amount as close to, or as of, the trial date as is feasible, given the constraints of the litigation process. The court may award post-judgment interest to compensate plaintiff for the delay in payment.

⁷ Michael K. Dunbar, Elizabeth A. Evans, and Roman L. Weil, "Ex Ante versus Ex Post Damages Calculations," *Litigation Services Handbook: The Role of the Financial Expert*, 5th ed., Roman L. Weil, Daniel G. Lentz, and David P. Hoffman, eds. (Hoboken, NJ: John Wiley & Sons, 2012), chap. 5, p. 2.

Information Considered and Relied Upon

The damages expert exercises considerable professional judgment in determining whether plaintiff experienced lost profits damages and the extent of any such loss. Whether the expert follows the *ex ante* or *ex post* method of damages assessment, the expert considers and relies upon a broad variety of information sources that the expert interprets based upon the expert's education, training, and professional experience.

Information available to the expert may arrive in a wide variety of forms and from many sources. In many cases, some of the information is of an objective nature, and some of the information is of a subjective nature. The quantitative information may simply be raw data, or the data may have been tabulated, summarized, and interpreted by the expert or someone else. For example, information potentially relevant to an expert evaluating lost profits could include actual or projected financial performance, business strategies, products and related pricing, trends in the availability and cost of acquired products and services, industry trends, competitor actions, economic conditions, consumer preferences, market share information, regulatory activities, and demographic shifts. The desired and relevant information for the expert's damages analysis may be provided by the client, obtained through litigation discovery (including depositions and interrogatory responses), or acquired by independent research of the expert.

Two sets of information can be equally credible, reliable, and accurate; however, the two collections of information may be markedly different. Damages experts generally agree that *ex ante* and *ex post* information often result in materially different computed damages amounts. However, damages experts may disagree about whether the *ex ante* or the *ex post* information and related lost profits damages is the better, more appropriate measure of plaintiff's loss, if any, from a theoretical viewpoint, given the economic and financial principles related to measuring a lost business opportunity.

At times, the expert's decision about whether to use the *ex ante* or *ex post* approach to damages measurement might be more influenced by the case facts than the expert's theoretical preference for one approach over the other. For example, in one case, the plaintiff planned on selling the business at some point shortly after the injury and, in another case, the plaintiff planned on keeping and growing the business indefinitely. In the former instance, the expert may select an *ex ante* approach because it would make the plaintiff economically whole. That is, the *ex ante* or lost business value damages would reflect the amount that the plaintiff could have obtained for the business—or what the business was worth to the owner—on or about the date of the legal violation, regardless of whether the business would have later done better or worse than *expected* as of that date. In the latter instance, the expert may select an *ex post* approach to compute damages for the purpose of making the plaintiff economically whole.

This chapter contrasts the *ex ante* and *ex post* approaches, including the typically different information sets used by each respective approach, to help the reader understand why the alternate methodologies may produce materially different lost profits damages amounts.

The *ex ante* approach considers only information available on or about the date of the legal violation by defendant. As of that date, the loss may be measured as the defendant-caused, diminished business value or the reduced discounted value of the stream of lost economic income following the date of the legal wrongdoing. The *ex ante* methodology for determining plaintiff's lost business value damages is based upon the *expected value* of economic income following the violation date, as determined based upon information available as of the legal violation date. This expected value necessarily embodies certain projections that were still uncertain or unresolved at the time of the legal wrongdoing. Regardless, proponents of the *ex ante* approach argue the theoretical appropriateness of computing lost business value or lost profits, as of the time of the legal violation, with information that was then available.

The *ex post* methodology considers information reasonably available or ascertainable through the respective loss valuation date, which often is on or about the date of trial. Advocates for the *ex post* approach believe the value that would have been realized from the impaired asset is revealed over time, for better or worse, so information becoming available after the date of the legal wrongdoing should be considered and, as appropriate, incorporated into the damages study. The additional information may allow the expert to refine the *ex ante* projections or expected value, although what the plaintiff would have accomplished in terms of but-for economic income given defendant's interference cannot necessarily be determined with certainty.

The following example demonstrates the impact on lost profits damages of *ex ante* versus *ex post* information and is not provided to demonstrate any court preference for one approach over the other. To illustrate where the difference between *ex post* and *ex ante* damages could be material, assume plaintiff had a lease for the exploration and production of oil and gas, the lease was wrongfully terminated, and plaintiff sued for contract termination damages. Further assume that the case was litigated for 10 years subsequent to the contract termination. At the time of termination, crude oil prices were at or below \$20 a barrel, and prices were then projected to increase to amounts not greater than \$30 a barrel over the next decade. During the ensuing 10 years, however, oil prices surged at times beyond \$100 a barrel. On behalf of the party terminating the lease, defendant's expert performed an *ex ante* damages analysis based on the contemporaneous oil price projections, and opined that the lost profits damages were \$0 or negligible because the price for crude oil was \$20 a barrel at the time of the lease termination, the price for crude oil was not expected to exceed \$30 per barrel during the ensuing decade, and the resultant present value of future cash flows was insufficient to cover the capital costs required to pursue the opportunity. Plaintiff's expert did an *ex post* damages analysis considering that the actual oil prices surged beyond \$100 per barrel within 10 years following the lease termination and substantially exceeded the opposing expert's *ex ante* oil price projections for most of the decade following the lease termination. Adjusting the damages model of defendant's expert only for the *ex post* (i.e., actual) oil prices resulted in a claim for millions of dollars of lost profits to the plaintiff.

Assuming the damages expert favors use of the *ex ante* methodology and the case facts appear to support this approach, can the expert simply ignore the *ex post* information as irrelevant? Of course, the intuitive answer is "no." However, damages experts advocating the *ex ante* view may have performed similar assignments without considering the *ex post* information. Sometimes, the expert takes this position based on the assignment provided by the attorney-client, who may represent, for example, that the defendant caused the full destruction of plaintiff's business so the attorney-client needs only an opinion of the business value as of the date of alleged wrongdoing.

Even if a damages expert prefers and applies the *ex ante* methodology, it would be imprudent for the expert to ignore the *ex post* information if it is available to the expert or can be provided with reasonable ease. The expected values developed or relied upon by the *ex ante* damages analyst inherently recognize that future outcomes may vary significantly from what is projected, as of the *ex ante* damages measurement date. Theoretically, the expected future economic cash flows as of the *ex ante* damages measurement date represent the weighted average of the then-anticipated range of alternative possible outcomes, which are subjected to a business valuation discount rate incorporating a risk premium for the uncertainty of possible *ex ante* outcomes. A full discussion of addressing risk and uncertainty through the discount rate appears in Chapter 17, "Discount Rates in Theory." By considering the actual post-violation or *ex post* information, and by comparing actual outcomes to the *ex ante* projections, the *ex ante* damages expert can cross-check the *ex ante* premises about then-envisioned future risks and uncertainties to ensure that the development of the expected value based upon *ex ante* information is reliable

and credible. If the *ex ante* damages expert does not consider the *ex post* information, the expert may be exposed to new information at deposition or trial about *ex post* actual outcomes or events outside of the range of variances previously considered possible by the expert. Further, the expert may be exposed to new information indicating that plaintiff's failure to achieve its expected value outcome was not entirely caused by the defendant, as represented to the expert by the engaging attorney-client.

Development of Case Law Regarding *Ex Ante* and *Ex Post* Analyses

The case law related to *ex ante* and *ex post* damages should be reviewed in light of the long-term historical legal environment for compensating a plaintiff for economic loss, the emergence over the last century or so of case decisions recognizing the use of *ex post* information to measure damages, the courts' modern recognition of the two alternative measures of damages, and recent case decisions adopting the *ex ante* or *ex post* approach for damages measurement. The purpose of this section is to apprise damages experts of various courts' legal expectations for the proof of lost profits, so the experts can intelligently select a court-acceptable methodology and engage the attorney-client in meaningful discussions about the topic. As an ultimate legal issue, however, the expert likely will rely upon the attorney-client for guidance about this aspect of the applicable law.

The question of whether damages should be measured with information available at the time of the legal violation, as opposed to information available at a much later point in time, was not particularly meaningful hundreds of years ago, such as in the pie-powder courts in England during medieval times. In that era, the legal wrongdoing and the trial of the offender occurred very close in time. The pie-powder court, also known as a pie-poudre court, was a special court that sat during public markets or fairs. This court had exclusive jurisdiction over disputes between merchants and consumers and any other dispute arising as a result of the market or on the fairgrounds. The term "pie-powder" came from the old French phrase describing a peddler, *pied puldreaux*, which referred to any alien merchant or, literally, the dusty feet of travelers and vagabonds. It was a summary court of justice and was intended to promptly address the difficulties between parties who came from faraway places to attend the fair, since their occupation required that immediate jurisdiction should be had in all cases. Therefore, it was normal for the transgressor to be arrested, the cause tried, and judgment given within a few hours. Sir William Blackstone's *Commentaries on the Laws of England* in 1768 described pie-powder courts as "the lowest, and at the same time the most expeditious, court of justice known to the law of England."⁸ For such a court, the issue of *ex post* information had little meaning or applicability.

As the time between the legal violation and the trial became more extended over the ensuing centuries, the question of whether to consider *ex post* information to resolve issues of economic damages became more germane. The U.S. Supreme Court dealt with the *ex post* issue as far back as 1830, in *Wilcox v. Executors of Plummer*,⁹ in which the court held, in part, "it is perfectly clear, that the proof of actual damage may extend to facts that occur and grow out of the injury, even up to the day of the verdict."¹⁰

One of the most significant and often-quoted cases concerning consideration of the *ex post* information arising subsequent to the injury included the term and popularized the concept of

8 http://avalon.law.yale.edu/18th_century/blackstone_bk3ch4.asp.

9 *Wilcox v. Executors of Plummer*, 29 U.S. 172, 183 (1830).

10 http://avalon.law.yale.edu/18th_century/blackstone_bk3ch4.asp.

the “book of wisdom.” In the 1933 landmark case, *Sinclair Refining Co. v. Jenkins Petroleum Process Co.*, the court wrote a unanimous opinion explaining that *ex post* data should be considered when determining the value of a patent and stated, in part, as follows:

[T]he absence of market value does not mean that the offender shall go quit of liability altogether. The law will make the best appraisal that it can, summoning to its service whatever aids it can command. . . . At times the only evidence available may be that supplied by testimony of experts as to the state of the art, the character of the improvement, and the probable increase of efficiency or saving of expense. . . . *This will generally be the case if the trial follows quickly after the issue of the patent.* But a different situation is presented if years have gone by before the evidence is offered. *Experience is then available to correct uncertain prophecy. Here is a book of wisdom that courts may not neglect. We find no rule of law that sets a clasp upon its pages, and forbids us to look within.*¹¹ [Emphasis added.]

Court decisions continue to recognize that, for many legal disputes, the court has the discretion to consider the *ex post* information, whether or not the ultimate damages award is based upon *ex ante* compared to *ex post* evidence. In *Anchor Savings Bank, FSB v. United States*,¹² the court referred to the two approaches as “two permissible methods of calculating damages—lost asset value and lost profits.”¹³

Collectively, court decisions acknowledge that two alternative methods are generally recognized and accepted for the measurement of economic damages, although understandably, the selection by the court of the method to be applied for any particular dispute may be subject to other legal matters and issues of fact. The following are a few examples from court decisions that recognize the potential use of the two alternative methodologies. In court decisions, it is common for the court to equate the *ex ante* approach with the term “lost business value” methodology and the *ex post* approach with the term “lost profits” methodology. These decisions acknowledge the potential application of either approach by finding that post-breach information “may” be considered in addition to the *ex ante* information:

We next address the question of whether lost profits are an appropriate measure of damages for the destruction of a nascent enterprise. The defendants argue that the appropriate measure of damages for the destruction of a business is its going concern value at the time of its destruction rather than lost profits. The plaintiff argues that the present value of a stream of expected future profits is an appropriate way to value a business and that it is therefore an appropriate measure of damages. We conclude that it is proper to award damages for the destruction of an unestablished enterprise and that lost profits may constitute an appropriate measure of damages for the destruction of such an enterprise.¹⁴

Neither *Lincoln* nor any of our other *Winstar* decisions bars the court from considering post-breach evidence in determining the quantum of a lost profits

11 *Sinclair Refining Co. v. Jenkins Petroleum Process Co.*, 289 U.S. 689, 698–99, 53 S. Ct. 736, 77 L. Ed. 1449 (1933).

12 *Anchor Savings Bank, FSB v. United States*, 597 F.3d 1356 (Fed. Cir. 2010).

13 “While economists heatedly argue one model versus the other, most agree that both *ex post* and *ex ante* are generally acceptable and widely used.” George P. Roach, “Correcting Uncertain Prophecies: An Analysis of Business Consequential Damages,” *The Review of Litigation* (University of Texas School of Law Publications, Winter 2003), p. 67.

14 *Beverly Hills Concepts, Inc. v. Schatz and Schatz, Ribicoff and Kotin*, 247 Conn. 48, 717, A.2d 724 (Conn. 1998).

award. As we have repeatedly recognized, the rule of favoring the measurement of damages as of the time of the breach “does not apply ... to anticipated profits or to other expectancy damages that, absent the breach, would have accrued on an ongoing basis over the course of the contract. In those circumstances, damages are measured throughout the course of the contract.” *Energy Capital Corp.*, 302 F.3d at 1330 ... “strict application of the [time-of-breach] rule may not result in the most accurate assessment of expectancy damages.” 518 F.3d at 1377. Thus, where it is necessary to fashion an appropriate award, a court “may consider post-breach evidence when determining damages in order to place the non-breaching party in as good a position as he would have been had the contract been performed.” *Id.*¹⁵

Considering the pertinent matters of law and issues of fact, courts may elect to apply either the *ex ante* or *ex post* approach to measuring damages. As a result, case decisions continue to arise that use either the *ex ante* or the *ex post* method of determining plaintiff’s economic loss.

In *Columbia Park Golf Course, Inc. v. City of Kennewick*,¹⁶ the court allowed a claim that measured damages as a lost business value as of the date of the legal violation. Plaintiff was a golf course operator with a 50-year lease. It sued the city for breach of a development option agreement after the city denied the development and operation of a recreational vehicle park instead of continuing operation as a golf driving range. Evidence to support a lost profits claim was not presented by plaintiff, considering that the nascent business was without the permits, approvals, and agreements needed to proceed with the development of the recreational vehicle park. Instead, plaintiff sought the lost monetary value of its bundle of rights in the form of the development option, which was established by expert testimony as the market value of the development option on or about the time of the breach. The trial court awarded \$3 million to plaintiff as the market value of the destroyed asset. The appeals court agreed with the award. “We agree with the trial judge that Columbia presented substantial evidence in support of its claims and was entitled to submit its claim for presently measurable damages, not lost profits, to the jury.”¹⁷ More specifically, the appeals court stated, “Under the lost asset theory of damage, it is irrelevant whether Mr. Long’s pro forma financial projections would have proven correct; what matters is only whether a market existed and whether a \$2.5 to \$3 million price would have been paid for the bundle of rights in that market. This is a distinction with a difference, and one that enables an injured party who holds a bundle of rights for which a market exists to avoid a ‘lost profits’ problem by subjecting its damage measure to measurement, cross-examination, and countervailing evidence available at the time of trial.”¹⁸

While this decision did not reject the use of *ex post* information as a general rule, it did acknowledge plaintiff’s decision not to pursue an award based upon profits lost after the breach, especially since plaintiff would have difficulty as a new business meeting the expected standard of proof for post-breach economic losses. The *Columbia* decision may reveal an important distinction by some courts regarding *ex ante* compared to *ex post* damages. The majority opinion distinguished between a market value for the development option at the time of the wrongdoing, which could be proven through expert testimony, compared to lost profits damages dependent upon an expected value based upon anticipated future outcomes that could not be proven with reasonable certainty. However, in the *Columbia* decision, a dissenting judge wrote that the difference between awarding lost business value and lost profits was really a distinction without

15 *Anchor Savings Bank, FSB v. United States*, 597 F.3d 1356 (Fed. Cir. 2010).

16 *Columbia Park Golf Course, Inc. v. City of Kennewick*, 160 Wash. App. 66, 248 P.3d 1067 (2008).

17 *Columbia Park Golf v. City of Kennewick*, 248 P.3d 1067 (Wash. Ct. App. 2011).

18 *Ibid.*

a difference, because the lost business value was nothing more than the then-discounted stream of expected future profits.

In fact, such a difference may exist because financial theory applies to both the *ex ante* and *ex post* approaches. A lost business value may be established, as of the date of the legal violation, as the value an investor would have paid for the business opportunity but for the legal violation, regardless of the basis by which the investor would have established the business value, and even though the hypothetical investor's ultimate actual economic earnings were, as yet, unknown based upon the available facts and information for the subject case. To summarize the noted distinction more directly, if the lost value at the time of legal violation can be established as a reasonably certain fact, then it doesn't matter whether that value can be reconciled credibly to the discounted value of some stream of future economic income. Given the relevant facts and court's decision in the *Columbia* case, the distinction is similar to the common experience of being able to determine a given day's closing price for an equity security without knowing or validating the investor's expectation of future economic returns.

On the other hand, some court decisions express a preference for use of the *ex post* information and the lost profits methodology to determine plaintiff's damages. Interestingly, many of these court decisions considered the argument by one party that the *ex ante* approach and any related lost business value must be the measure of damages. Often, this position is taken by (1) a plaintiff when the *ex post* damages are less, especially when \$0 or a *de minimis* amount, or (2) a defendant when the *ex ante* damages are less than plaintiff's claim based upon the *ex post* methodology. Regardless of any argument that the *ex ante* or lost business value damages must be the measure of plaintiff's loss, these court decisions recognize that two acceptable methods exist to value plaintiff's economic loss, and the courts conclude that plaintiff's loss is best determined using the *ex post* approach and the lost profits methodology.

*Fishman v. Estate of Wirtz*¹⁹ was an appeal concerning the 1972 purchase by defendant of the Chicago Bulls basketball team. Plaintiffs also sought to purchase the Bulls and brought suit alleging that the Bulls had been acquired through anti-trust violations. The trial court ruled that defendants violated the Sherman Act and awarded plaintiff treble damages for the violations. The trial court allowed a claim of \$4.7 million (before trebling) for plaintiff's monetary damages from having been deprived of ownership of the Chicago Bulls basketball team between 1972 and 1982.

In their appeal, defendants argued that damages must be computed as of the date of the injury (1972). Defendants further argued that the going-concern value of the Bulls in 1972 represented a full recovery for plaintiff because, by definition, what a buyer would have paid for the team in 1972 is an expected future income stream discounted to present value. More specifically, defendants argued that plaintiff's damages amounted to \$50,000, representing the difference between defendant's and plaintiff's offers for the franchise (\$3.35 million versus \$3.3 million, respectively).

The appellate court held as follows:

The district court's valuation is based on actual gain experienced by the Bulls over ten years. (The 1972 going-concern value was affected by a number of *ex ante* predictions, which were proved either true or false and were reflected in the 1982 value.) We do not understand defendants' objection to using this adjusted value... because we know of no case that suggests that a value based on expectation of gain is more relevant and reliable than one derived from actual gain.²⁰

19 *Fishman v. Estate of Wirtz*, 807 F.2d 520 (7th Cir. 1986).

20 *Ibid.*

In the *Anchor Savings* case referenced above, plaintiff was forced to sell RFC, a subsidiary, to satisfy new regulatory capital requirements after implementation of Financial Institutions Reform, Recovery, and Enforcement Act of 1989 (FIRREA). RFC was acquired by GMAC for a distressed sale price, but RFC subsequently produced substantially more profits than expected at the acquisition date, as a result of the rapid growth of the profitable subprime mortgage industry. Anchor Savings sought hundreds of millions of dollars of *ex post* lost profits. In rebuttal, the government strenuously argued that damages must be measured based upon the business value at the date plaintiff was forced to dispose of the entity. The court rejected the government's argument for the *ex ante* or business valuation method as the damages measurement. "Ultimately, the court concluded that the most accurate approach was to base the award of damages on RFC's actual post-breach profits under GMAC."²¹

While some court decisions have expressed a preference for the *ex ante* methodology and others have expressed a preference for *ex post* damages analysis, generally the courts have trended in favor of considering the *ex post* information and related damages measurement methodology, particularly in the federal courts.²² Although practitioners continue to debate the academic merits of using *ex ante* and *ex post* information, and whether the corresponding damages calculation approach is the theoretically appropriate measure of economic loss by the plaintiff, most damages analysis experts agree that both approaches are generally accepted methodologies and acknowledge that a court may exercise its discretion in adopting either approach, considering the pertinent matters of law and issues of fact particular to the case at hand. As such, damages experts generally should start with the premise that either approach may be available for damages measurement and then make the methodology decision based upon the case facts and apparent prevailing law. For jurisdictions where there are competing legal authorities about use of the *ex ante* versus *ex post* methodologies, a theoretical but seldom-used option for the damages expert is to calculate damages under both the *ex ante* and *ex post* methods and let the trier of fact decide which approach is preferable under the circumstances.

Summary of the Current Academic Debate

Based upon economic, financial, and accounting principles, academics and practitioners disagree whether the *ex ante* or *ex post* information should be used to evaluate damages and whether the respective lost business value or lost profits methodology is the theoretically correct measure of economic harm to plaintiff caused by defendant. In 1990, three seminal articles were published that explain the bases for the continuing intense debate among academics as well as damages experts. These articles are still relevant today. This section summarizes the views expressed in these writings.

Lanzillotti and Esquibel (1990)

R.F. Lanzillotti²³ and A.K. Esquibel²⁴ (L&E) wrote an article for the January 1990 edition of the *Journal of Accounting, Auditing & Finance*, "Measuring Damages in Commercial Litigation:

²¹ *Anchor Savings Bank*, §12.

²² George P. Roach, "Correcting Uncertain Prophecies: An Analysis of Business Consequential Damages," *The Review of Litigation* (University of Texas School of Law Publications, Winter 2003), pp. 3 and 38. Tyler J. Bowles, "Hindsight in Commercial Damages Analysis," *Journal of Legal Economics*, vol. 14, no. 3 (March 2008), p. 2. John D. Taurman and Jeffrey C. Bodington, "Measuring Damage to a Firm's Profitability: Ex Ante or Ex Post?" *The Antitrust Bulletin*, vol. 37, no. 1 (Spring 1992), pp. 57-58.

²³ Robert F. Lanzillotti was Dean Emeritus, Eminent Scholar Professor of American Economic Institutions and Director of the Public Policy Research Center, Graduate School of Business Administration, University of Florida.

²⁴ Amanda K. Esquibel was an associate with the law firm of Holland and Knight, Tampa, Florida and a research fellow at the Public Policy Research Center and senior managing editor of the *Florida Law Review*.

Present Value of Lost Opportunities”²⁵ (L&E article).

L&E set forth a framework for determining the present value of an economic damages award and discussed several damages measurement concepts, including lost past profits compared to lost future profits.²⁶ L&E states that they are addressing the “hodgepodge” of damages approaches presented by experts and considered by the courts and aim to articulate an improved framework of methodologies for measuring business losses. While the L&E article does not use the terms *ex ante* or *ex post*, L&E define the respective approaches (but in reverse order), as follows:

Approach B [the *ex ante* approach] carefully follows financial theory and calculates the expected profits at the time of the violation, arguing also that any information that becomes available subsequent to the violation is irrelevant. Approach B, therefore, ignores historical information.²⁷

Approach A [the *ex post* approach] emphasizes that expected profits are merely estimates or projections. Erroneous estimates by investors and businessmen are commonplace. Therefore, Approach A takes the position that it is advantageous to incorporate as much historical data as are available. Historical data are a better predictor than the expectations of businessmen. This approach also is in line with the predisposition of courts to look at the historical performance of a business in making damage awards.²⁸

The L&E article provides an economic and financial framework for determining the present value of a plaintiff’s damages award, and it does not express a preference for either the *ex ante* or *ex post* approach.

Fisher and Romaine (1990)

Franklin M. Fisher²⁹ and R. Craig Romaine³⁰ (F&R) wrote an article for the Winter 1990 issue of the *Journal of Accounting, Auditing & Finance*, “Janis Joplin’s Yearbook and the Theory of Damages”³¹ (the F&R article). The F&R article was written following a conference to discuss the Lanzillotti and Esquibel paper summarized above. The F&R article is quite robust and covers more ideas and issues than are summarized in this chapter. As such, the full F&R article is recommended reading for the damages analyst.

The F&R article title refers to Janis Joplin’s yearbook. As the article explains, during a Texas deposition, one of the authors was asked what damages a hypothetical plaintiff suffered if plaintiff’s yearbook was stolen by a defendant. Assume that Janis Joplin, at that time merely a high school classmate, signed the yearbook before she became famous. The yearbook is stolen and, at the time of the theft, comparable yearbooks were being bought and sold for \$5. After the theft but before the trial, Janis Joplin becomes famous, so the yearbook with her signature is worth \$1,000 on the trial date. Under the *ex ante* approach, the damages are based on the value

25 Robert F. Lanzillotti and Amanda K. Esquibel, “Measuring Damages in Commercial Litigation: Present Value of Lost Opportunities,” *Journal of Accounting, Auditing & Finance* (January 1990), pp. 125–142.

26 *Ibid.*, 132–133.

27 In the L&E article, the terms “historical information” and “historical data” refer to information between the time of the violation and the time of trial. Approach A incorporates such historical information, i.e., actual profits (materialized values), whereas Approach B would not consider information subsequent to the time of violation.

28 Lanzillotti and Esquibel, “Measuring Damages in Commercial Litigation: Present Value of Lost Opportunities,” p. 138.

29 Franklin M. Fisher received his PhD, MA, and AB in economics from Harvard University, and he is Professor of Microeconomics, Emeritus, Massachusetts Institute of Technology.

30 R. Craig Romaine received his PhD and MA in economics from the University of Chicago, and he is a vice president of Charles River Associates.

31 Franklin M. Fisher and R. Craig Romaine, “Janis Joplin’s Yearbook and the Theory of Damages,” *Journal of Accounting, Auditing & Finance* (Winter 1990), p. 145.

of the yearbook when it was stolen (\$5). Under the *ex post* approach, the damages are based on the value of the yearbook at the time of trial (\$1,000).

F&R conclude that economic losses to a plaintiff should be valued based upon the *ex ante* approach and are critical of damages determined using the *ex post* methodology. Some of the F&R opinions expressed in their article are capsulized below. F&R use the term “hindsight” to refer to information arising between the date of the legal violation and the date of the trial, although in fact all information available through the trial date could be viewed by the trial court with hindsight, including the information available through and including the date of the legal violation.

The violation did not merely deprive the plaintiff of the stream of returns that would have accompanied the asset. It also relieved the plaintiff of the uncertainty surrounding that stream. To use hindsight is to ignore the latter effect.³²

[O]ur position is that hindsight should not be used [to estimate the stream of returns to be discounted].³³

[T]here is no difference in principle between a claim for a stream of lost profits and a claim for the destruction of an asset. An asset is in fact worth the present value of the profit stream associated with it; to turn the matter around, the possession of a profit stream is the possession of an asset worth the present value of that stream.³⁴

In short, F&R opine that plaintiff should be compensated for its loss valued as of the violation date, and plaintiff should not be compensated for any risks that it did not bear. Many lost profits experts favoring the *ex ante* methodology defend their belief based upon the F&R concept and article language that a plaintiff should not be compensated for lost profits when not bearing the attendant risk and uncertainty of achievement.

The F&R article includes discussion of many more topics, such as use of a risk-free prejudgment interest rate and the treatment of taxes. F&R also object to the *ex post* approach because it provides a plaintiff the option to pursue a lawsuit when the *ex post* outcome is favorable and pass on a lawsuit when the *ex post* information indicates that plaintiff would have encountered an “unexpectedly disastrous turn of events” (i.e., negative damages).

Bonsack (1990)

In response to F&R, Konrad Bonsack (KB)³⁵ wrote an article for the 1990-1991 edition of the *George Mason University Law Review*, “Damages Assessment, Janis Joplin’s Yearbook, and the Pie-Powder Court”³⁶ (the KB article). Like the F&R article, the KB writing also is quite robust and covers more ideas and issues than are summarized in this chapter. As such, the full KB article also is recommended reading for the damages analyst.

The KB article includes an overview and analysis of the migration from *ex ante* damages of medieval times through the present court acceptance of either the *ex ante* or *ex post* methodology for measuring plaintiff’s economic loss. In this process, KB cites academic treatises and various cases as early as 1834 (which still echoed the “pie-powder court” *ex ante* damages, but with the addition of prejudgment interest to account for the delay from the legal violation date

32 Ibid., 154.

33 Ibid., 153.

34 Ibid., 149.

35 Konrad Bonsack was a managing associate with Nathan Associates.

36 Konrad Bonsack, “Damages Assessment, Janis Joplin’s Yearbook, and the Pie-Powder Court,” *George Mason University Law Review*, vol. 13, no. 1 (Fall 1990).

through the damages award date³⁷). The KB article explains and defends the use of the *ex post* damages methodology and often provides direct rebuttals to the opinions expressed by F&R. A summary of some of the reasons for KB's preference for the *ex post* methodology is presented below:

[T]he assessment of damages should depend on information available up to the time of trial, and, therefore, hindsight should be used.³⁸

An examination of the theory of compensatory damages assessment and its evolution in U.S. courts has shown that, today, the goal of compensatory damages awards is the restoration of the plaintiff to the position he would have occupied, absent the defendant's violation, for all time. The measure of the change in the value of a damaged or destroyed asset, while often yielding a correct compensatory damages award, is not the proper focus of inquiry. Instead, the general framework of analysis requires the calculation of two distinct components: the sum of money that compensates for any past unavoidable losses, and the sum of money that enables the plaintiff to avoid all future adverse consequences, if any, resulting from the defendant's violation. Within this framework of analysis, hindsight plays an indispensable role.³⁹

The KB article was perhaps one of the first treatises to frame the issue of damages determination methodologies as *ex ante* and *ex post*. KB recognizes that the violation and the trial are not simultaneous and that the trial often occurs much later in time. KB rejects the F&R notion that the violation relieved plaintiff of the risks of asset ownership. KB observes that the violation deprived the asset owner of both the risks and rewards of continued but-for asset ownership. In fact, KB observes that the violation and asset taking was a constructive forced sale, depriving the asset owner of any potential economic rewards, or suffering any hoped-for shortfalls, as time resolves certain risks and uncertainties following the violation. Thus, the period of economic injury does not conclude on the date of the legal violation but continues over time. In short, the passage of time will reveal, for better or worse, the intrinsic value of the asset as of the date of the legal violation.

Computational Mechanics of Business Valuation versus Lost Profits Methodologies

The computational mechanics for determining *ex ante* damages involving a lost future stream of expected economic income as of the date of the legal violation are relatively straightforward, at least from a conceptual viewpoint. Based only upon the *ex ante* information, the damages analyst schedules the lost expected economic income into then-future periods and then determines the present value as of the date of injury using an appropriate, risk-inclusive discount rate. This analytical process should yield the damages measurement in terms of lost value as of the *ex ante* date of the legal wrongdoing. That amount is translated to economic damages as of the trial date by application of either an economic or legal prejudgment interest rate, as

37 *Parks v. Boston*, 32 Mass. (15 Pick.) 198, 208–09 (1834).

38 Bonsack, "Damages Assessment, Janis Joplin's Yearbook, and the Pie-Powder Court," p. 1. This article defines "hindsight" as "knowledge of facts available only after the time of the violation."

39 *Ibid.*, 25–26.

appropriate.⁴⁰

For *ex post* damages, there generally are two alternative approaches to computing plaintiff's loss, both of which are influenced by the *ex post* information arising after the date of the legal violation.

In the first alternative, the same computational process as described above for the *ex ante* methodology may be followed, except that the *ex ante* purported expected stream of lost economic profits may be adjusted or refined using the *ex post* information, and, if appropriate, the applied discount rate may be amended to the extent that some risk or uncertainty has been resolved by the passage of time after the legal wrongdoing, as discussed in more depth in Chapter 17, "Discount Rates in Theory." Because the described approach uses the *ex post* information, it is appropriately categorized within the *ex post* methodology. Some experts use this approach because they reject the opposing party's or expert's asserted *ex ante* expected value as misstated, and use *ex post* information or hindsight to correct any *ex ante* error, often for determining the more realistic intrinsic value of the destroyed asset to its owner. For example, consider the example earlier in the chapter concerning an owner's loss as of the date that an oil exploration and recovery lease was terminated. The plaintiff's expert used the more favorable post-termination, *ex post* oil prices in the determination of the lost value as of the *ex ante* date. In that example, all projected losses by both the *ex ante* and *ex post* opposing experts were discounted back to the date of the legal violation.

In the second alternative, the *ex post* damages analyst may apply different procedures for discounting and prejudgment interest than the *ex ante* analyst, depending upon whether the post-injury losses occurred before the trial (i.e., past damages) or will occur after the trial (i.e., future damages). For the past damages, the *ex post* expert attempts to determine what economic income was actually lost by the plaintiff. Although these figures are hypothetical "actual" economic income, and presumably more certain than the *ex ante* projected or expected values, these amounts typically are presented to the trier of fact as the returns plaintiff would have experienced but for interference by the defendant. As such, the past losses are not discounted back to the *ex ante* date but are subject to economic or prejudgment interest through the trial date. In contrast, the projected future or post-trial losses are discounted to the date of trial—rather than to the *ex ante* or legal violation date—and are not subject to prejudgment interest. Arguably, the post-trial expected income has been honed by use of the *ex post* information, which may influence the degree of unresolved risk and the discount rate, compared to the *ex ante* values developed as of the date of the legal wrongdoing. Regardless, as many experienced experts note, the discount rate should still include risk premia for the remaining projection uncertainty and be compatible with the discount rates expected by investors in similarly risky projects on or about the trial date.

The Legal Requirements for Discounting and Interest

The legal principles for damages measurement include the general requirement to discount future economic losses to a present value as of the time of trial, as explained in Chapter 2, "Legal Principles for Lost Profits Damages and Related Expert Testimony." The mathematics for discounting are explained in detail in Chapter 16, "Present Value Concepts and Damages Modeling." The types of discount rates available to the expert are explored in Chapter 17, "Discount Rates

⁴⁰ For purposes of this discussion, the damages analyst is assumed to perform damages modeling as well as the interest or discounting calculations. This caveat recognizes the possibility of an expert developing a damages opinion without performing the subject analysis, modeling, and damages computations, such as by adopting a simple *ex ante* or *ex post* yardstick measure of a business value to opine about any loss by a plaintiff.

in Theory.” From a general legal viewpoint, however, discounting of future losses is required:

Future profits should be discounted to present value at an appropriate rate because the purpose of the award of damages is to provide a fund that, including principal and interest, will yield plaintiff an amount equivalent of its loss.⁴¹

Similarly, the legal principles related to past damages require the application of interest through the date of trial to compensate a plaintiff for the time value of money; this concept is consistent with economic and financial theory. Prejudgment interest may be based upon an economic or legal rate. Although economic interest generally is applied on a compound basis, a legal rate of interest may be either simple or compound. Both the rate of legal prejudgment interest and its application on a simple or compound basis are topics the damages expert may discuss with the attorney-client and rely upon the guidance received for the calculation of the prejudgment interest. The topic of prejudgment interest is addressed in full in Chapter 20, “Pre- and Post-judgment Interest.”

When damages are initially valued at a point or points in time before the trial, the legal requirement generally allows for interest through the date of trial. This legal principle generally applies to the *ex ante* approach that discounts all post-violation date losses to the *ex ante* date of legal wrongdoing. For example, in *Scholz et al. v. Metropolitan Pathologists, P.C.*, the Colorado Supreme Court held:

If the trier of fact discounts future damages to the date of the incident, then an interest factor should be used to convert the damages from a date-of-incident value into a date-of-trial value.⁴²

A plaintiff usually is not compensated contemporaneously as of the date of the wrongful act for any loss caused by the defendant’s legal wrongdoing. As a consequence, the damages expert should translate the past and future economic losses into values on or about the trial date. The past damages are computed including prejudgment interest based upon either a legally required statutory rate or, otherwise, an acceptable economic rate for the lost use of money. For future damages, the present value is determined using an appropriate discount rate.

The steps in the *ex ante* and *ex post* approaches for computing interest and for discounting are conceptually straightforward.

For the *ex ante* approach, to determine the total award demand at the time of trial, all expected periodic lost economic income after the violation date is discounted to the date of the violation. Then, the present value of the damages as of the *ex ante* violation date is the base used to determine the economic or prejudgment interest amount, on or about the trial date.

For the *ex post* methodology, the application of discounting or interest depends upon the initial valuation date for plaintiff’s losses. If plaintiff’s lost business value or lost profits are initially valued as of the *ex ante* date but considering *ex post* information, then computed damages are first discounted to the *ex ante* valuation date and the resultant present value is then incremented for interest to the date of trial. Mechanically, this is the same method used for the *ex ante* approach.

For many *ex post* lost profits analyses, the past damages are determined as the estimated profits plaintiff would have achieved but for the defendant’s violation and at the times that those amounts would have been achieved. Therefore, the past damages are not discounted, but only subject to interest to the date of trial. Further, post-trial or future damages are discounted to the trial date (rather than the *ex ante* valuation date), and economic or prejudgment interest is not applied to the post-trial damages amounts.

41 Robert L. Dunn, *Recovery of Damages for Lost Profits*, 6th ed. (Westport, CT: Lawpress Corporation, 2005), §6.24.

42 *Scholz et al. v. Metropolitan Pathologists, P.C.*, 851 P.2d 901 (1993).

Ex Ante and *Ex Post* Conditions for Parity in Final Results

Experts have considered whether the *ex ante* and *ex post* approaches will produce differing damages amounts and, more specifically, whether the total damages computed using the business valuation methodology will constitute the upper limit of any lost profits damages. This section explores the premises and conditions required for the two methodologies to yield the same damages total. Of course, any differences in the computational premises can result in differing damages amounts, including the lost profits damages exceeding the related lost business value damages.

Ex post or lost profits damages and *ex ante* or lost business value damages will necessarily be equal only under a well-defined but narrow set of conditions. The monetary parity will result only if the alternative computations employ the same premises and calculation factors, including but not limited to the same ultimate damages present value date (i.e., time of the trial), standard of value, information set, unresolved risk factors, loss period, discount rate, prejudgment interest rate, and offsetting mitigation. If equality exists for all such considerations or variables, then lost business value and lost profits damages amounts will be the same, inclusive of discounting and prejudgment interest. As a practical matter, all things are seldom equal, and opposing experts seldom, if ever, agree on all damages model premises, calculation factors, and input data. Considering the facts and circumstances related to a particular case, coupled with the court's objective of measuring plaintiff's loss of but-for economic income in terms of the award amount needed to make plaintiff economically whole, opposing experts often develop and present markedly different total damages amounts, including discounting and interest rates, when experts use the alternative methodologies for lost business value compared to lost profits.⁴³

It is important to note that the *ex ante* and *ex post* methods for determining total damages at the time of trial will produce identical results when all computational factors are the same, including the discounting and interest rates. This equivalence remains true even when the discounting and interest computations are applied using different initial valuation dates. Specifically, assume that both the *ex ante* and *ex post* damages analysts identify the same lost economic income by period for a finite period of damages following the legal violation, but the *ex ante* expert discounts all losses to the *ex ante* valuation date and then applies interest to the trial date, while the *ex post* expert applies only interest to the past damages and discounts the future damages to the date of trial. For both experts to compute identical total damages as of the trial date, the discounting, and prejudgment interest rates would have to be the same and, further, both the interest and discounting calculations would have to be performed on a consistent, compound basis.⁴⁴

It would be rare to find the *ex ante* and *ex post* damages analysts in agreement about (1) all of the objective or quantitative computational factors used to model the damages before interest or discounting and (2) the discount rate and the interest rate, including whether interest is simple or compound. Nevertheless, an exploration of the circumstances where the *ex ante* and *ex post* approaches yield the same damages figure serves to illustrate the important similarities and differences between the approaches. This exercise is performed in the following section.

43 Everett P. Harry, "Lost Profits and Lost Business Value—Differing Damages Measures," *Dunn on Damages—The Economic Damages Report for Litigators and Experts*, issue 1 (December 2010).

44 The formula for discounting is $1/(1+i)^n$, which, by definition, is compounded. Parity is reached only if prejudgment interest is also compounded in both methods.

Ex Ante and *Ex Post* Concepts Illustrated

The remainder of this chapter illustrates the respective concepts and attributes of the *ex ante* and *ex post* approaches to measuring lost profits damages.⁴⁵ For this purpose, a simple case study is used based on the following assumed facts:

- For five years before the event giving rise to the damages, plaintiff earned \$1 million in the first year, subsequently growing at 3 percent a year, compounded annually, through Year 5.
- Beginning in Year 6, plaintiff was injured by the wrongful conduct of the defendant, and, in that year, plaintiff's profits declined to \$100,000.
- The trial date was at the beginning of Year 9, or three years following the date of injury. Damages for the three years from the date of injury through the date of trial (i.e., years 6 through 8, inclusive) constitute the past lost profits.
- Between the date of injury and the trial date, plaintiff was able to partially mitigate its damages by commencing the gradual recovery of the lost sales and profits.
- As of the trial date, plaintiff's expert projected (a) plaintiff's but-for economic profits had plaintiff not been injured by the defendant, and (b) plaintiff's anticipated actual, but impaired, economic profits through Year 12.⁴⁶ By Year 13, plaintiff anticipated that it would be able to fully mitigate its damages, at which time its but-for and experienced or anticipated actual economic income would converge. Damages for the four years from date of trial through Year 12 (i.e., years 9 through 12, inclusive) are the period of future lost profits.
- For convenience and simplicity, all amounts are assumed to have been received ratably throughout the year, so the mid-year convention was used for discounting lost profits to present value.

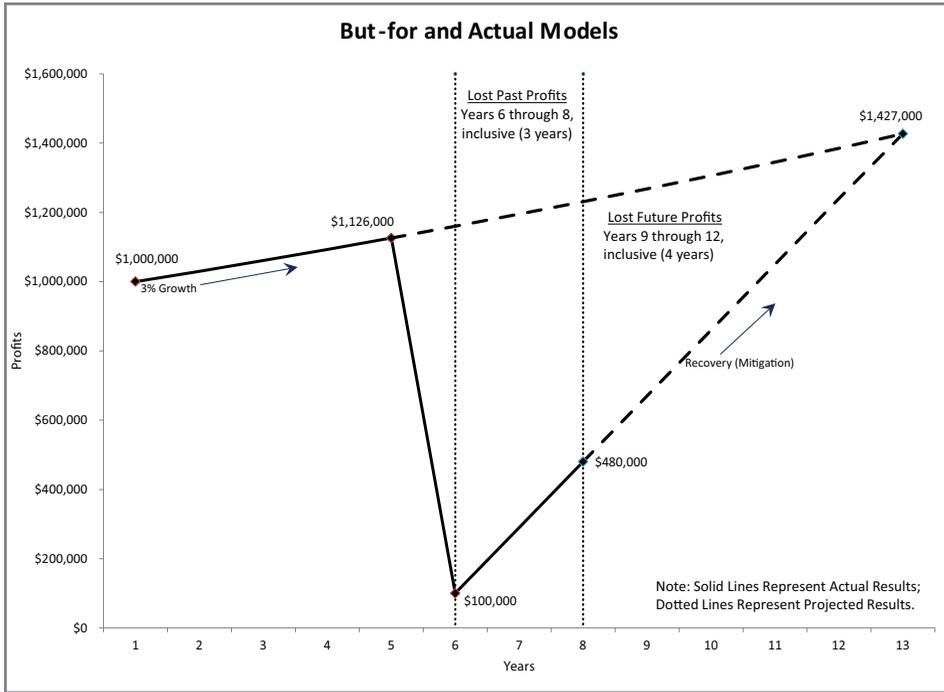
The presumed case facts are illustrated in Exhibit 4.1 and Exhibit 4.2. The case study reflects a finite or closed period of damages, not the permanent destruction of all or a portion of plaintiff's business value.

The figures below could be used as demonstrative exhibits at trial to educate the trier of fact about the nature of plaintiff's loss to determine the total damages as of the trial date. Exhibit 4.1 is a line graph. Damages represent the difference between the projected but-for economic profits and the actual past or anticipated future actual economic profits for years 6 through 12.

45 Peter Schulman, "Economic Damages: Discounting Concepts and Alternatives," *The Colorado Lawyer*, vol. 28, no. 1 (January 1999), and Peter Schulman and C. Brad Peterson, "Understanding Discounting in Litigation," *The Colorado Lawyer*, vol. 36, no. 4 (April 2007).

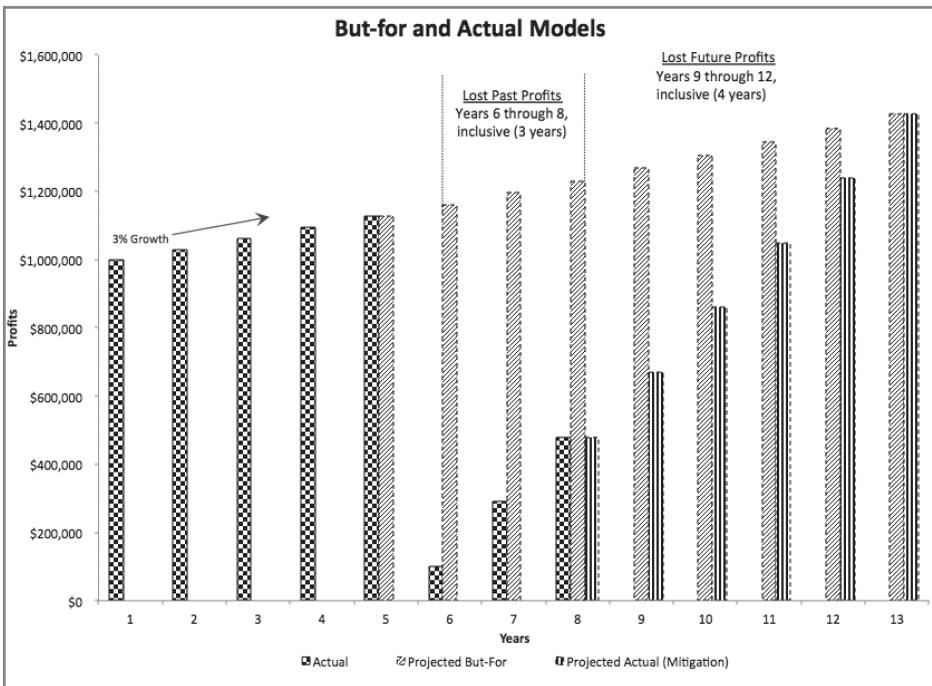
46 In practice, the but-for model is sometimes referred to as the "unimpaired" model, and the actual model is referred to as the "impaired" model.

Exhibit 4.1: But-for and Actual Models: Line Graph



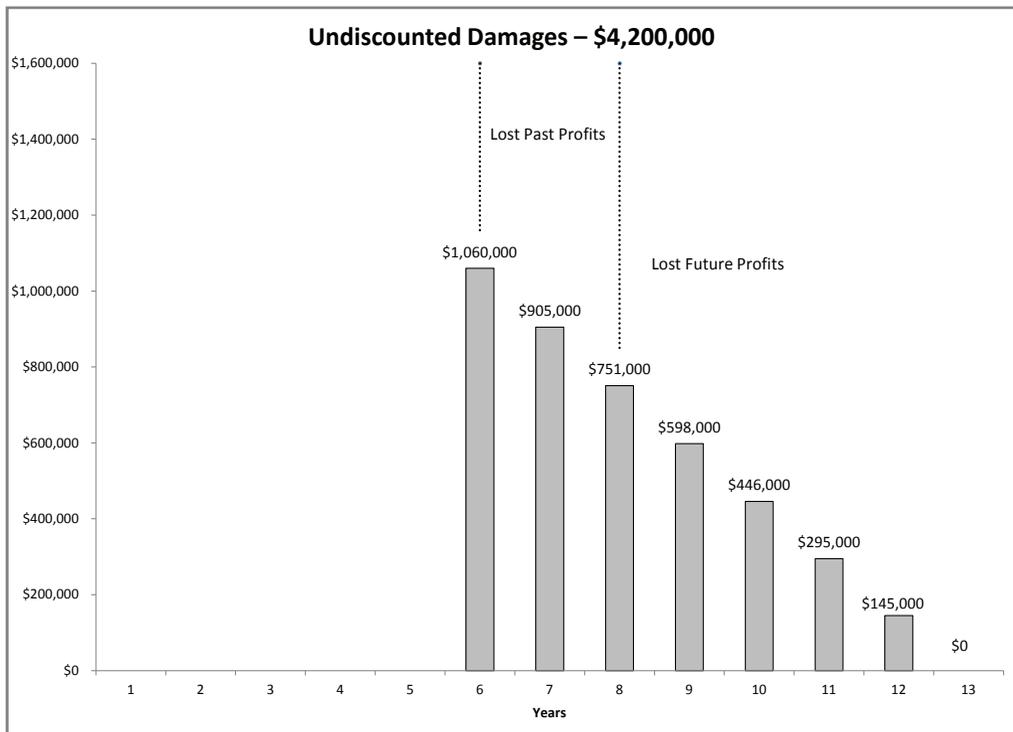
Another way of presenting the information in Exhibit 4.1 is reflected in Exhibit 4.2, which is a bar graph instead of a line graph. Both charts present the same information, but the expert could prepare both and make the selection for trial use given the preference of the attorney-client.

Exhibit 4.2: But-for and Actual Models: Bar Graph



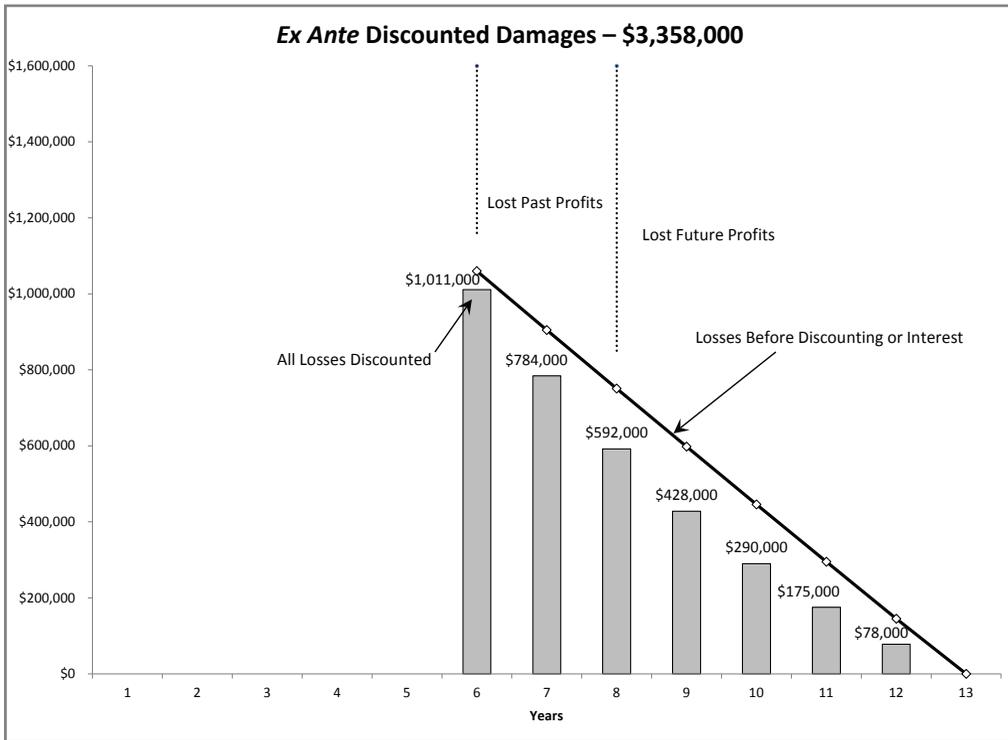
Plaintiff’s lost profits damages are implied in Exhibit 4.1 and Exhibit 4.2 as the difference between the projected but-for and actual or anticipated economic profits for years 6 through 13 (with Year 13 having \$0 damages). The lost profits may be directly displayed in graphical form, as illustrated by Exhibit 4.3. This chart has the advantage of focus on plaintiff’s loss, but the disadvantage of eliminating the trend information for the but-for and impaired streams of economic income.

Exhibit 4.3: Damages Graph



In an *ex ante* damages analysis, only information available at the time of the injury is considered for the computation of plaintiff’s lost business value or lost profits. The *ex ante* date is used for the pre-interest determination of the present value of plaintiff’s loss, so both the past and future lost profits with respect to the trial date are discounted to the date of injury. *Ex ante* damages—discounted at a 10 percent rate—compared to the undiscounted damages are presented graphically in Exhibit 4.4.⁴⁷

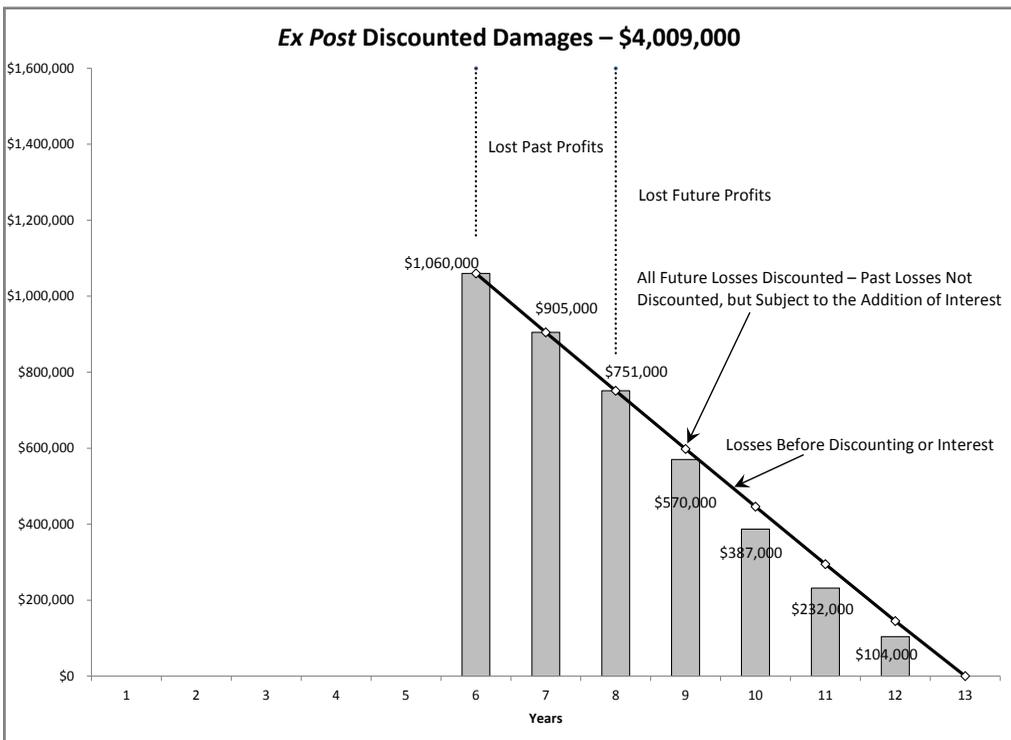
Exhibit 4.4: *Ex Ante* Discounted Damages Graph



47 Although the visual image suggests that the discounted losses in the latter part of the damages period are relatively closer to the respective undiscounted amounts and, thus, are not discounted as much, such is not the case. In fact, the cumulative discounting factors increase over the damages period, but the amounts subject to discounting are rapidly declining and are projected to be fully mitigated by Year 13; hence, the potentially misleading visual impression.

One approach to an *ex post* lost profits analysis involves the use of *ex post* information to refine the but-for projections of economic income as of the *ex ante* date of legal wrongdoing. In this case, the computed losses are first discounted to the *ex ante* date before adjusting for interest to the date of trial. In other *ex post* analyses, the computed lost economic income through the trial date (past losses) is not discounted but subject only to interest to the trial date, while the projected lost economic income after the trial (future losses) is subject only to discounting to the trial date and not interest. For this latter form of an *ex post* damages analysis, Exhibit 4.5 illustrates the pre-interest past losses and the post-trial or future losses that are discounted to the date of trial at a 10 percent discount rate.

Exhibit 4.5: Ex Post Discounted Damages Graph



Total damages, inclusive of discounting and interest, at the time of trial may be equal for the *ex ante* and *ex post* methodologies only under special, limited circumstances, as explained above. Regardless of the particular *ex post* approach used by the expert (i.e., *ex ante* measurement date before interest but using *ex post* information versus *ex post* past losses subject only to interest plus future losses discounted to the trial date but not subject to interest), total damages at the date of trial cannot equal the *ex ante* amount unless all computation factors are the same. In particular, the prejudgment interest rate and the discount rate must be equal (e.g., 10 percent for each) and the prejudgment interest rate must be compound for both the *ex ante* and *ex post* approaches. Under this narrow and rare set of circumstances, the *ex ante* and *ex post* damages as of the trial date necessarily will be equivalent.

The damages expert can benefit from knowledge of this potential parity as a basis for understanding the reasons that total damages at the trial date often differ substantially between use of the *ex ante* and the *ex post* methodology. Exhibit 4.6 demonstrates that parity is achieved for the hypothetical case facts when subjected, for example, to a 10 percent discount rate and a 10 percent annually compounded prejudgment interest rate (PJI).

Exhibit 4.6: *Ex Ante* v. *Ex Post* at 10% Discount and PJI Rates (Parity)

Summary – <i>Ex Ante</i> and <i>Ex Post</i> Compared at a Discount Rate of 10% and a PJI Rate of 10% Compounded Annually				
	<i>Ex Ante</i>	<i>Ex Post</i>	Difference	% Diff
	\$4,200,000	\$4,200,000	\$0	0.00%
Discounted	\$3,358,000	\$4,009,000	\$651,000	19.39%
Prejudgment Interest (PJI)	1,111,498	460,498	(651,000)	-58.57%
PJI plus Discounted Damages	\$4,469,498	\$4,469,498	\$0	0.00%

In practice, the discount rate tends to be higher than the interest rate, regardless of whether (1) a risk-adjusted or risk-abated⁴⁸ discount rate is used, (2) the interest rate is applied either on a simple or compound basis, and (3) the damages analysis is performed using an *ex ante* or an *ex post* approach. Whenever the discount rate is higher than the prejudgment interest rate, assuming all other computational factors are the same, an *ex post* analysis will produce higher total damages, as of the trial date, than an *ex ante* analysis. This is illustrated in Exhibit 4.7.

**Exhibit 4.7: *Ex Ante* v. *Ex Post* at 10% Discount Rate
and 7% PJI Interest Rate**

Summary – <i>Ex Ante</i> and <i>Ex Post</i> Compared at a Discount Rate of 10% and a PJI Rate of 7% Compounded Annually				
	<i>Ex Ante</i>	<i>Ex Post</i>	Difference	% Diff
	\$4,200,000	\$4,200,000	\$0	0.00%
Discounted	\$3,358,000	\$4,009,000	\$651,000	19.39%
Prejudgment Interest (PJI)	755,694	317,860	(437,834)	-57.94%
PJI plus Discounted Damages	\$4,113,694	\$4,326,860	\$213,166	5.18%

48 Robert L. Dunn and Everett P. Harry, “Modeling and Discounting Future Damages: Income Stream Analysis Gives a Better Picture of What a Plaintiff Really May Have Lost,” *Journal of Accountancy*, vol. 193, no. 1 (January 2002).

Conversely, if a discount rate is lower than the PJI rate, then an *ex post* analysis will produce a lower result for total damages as of the trial date than an *ex ante* analysis. Exhibit 4.8 presents an example to support this theoretical observation, although this actual relationship is not often observed in practice.⁴⁹

Exhibit 4.8: Ex Ante v. Ex Post at 4% Discount Rate and 7% PJI Interest Rate

Summary – Ex Ante and Ex Post Compared at a Discount Rate of 4% and a PJI Rate of 7% Compounded Annually				
	<i>Ex Ante</i>	<i>Ex Post</i>	Difference	% Diff
	\$4,200,000	\$4,200,000	\$0	0.00%
Discounted	\$3,818,000	\$4,116,000	\$298,000	7.81%
Prejudgment Interest (PJI)	859,214	317,860	(541,354)	-63.01%
PJI plus Discounted Damages	\$4,677,214	\$4,433,860	(\$243,354)	-5.20%

Note that the “swing” between Exhibit 4.7 and Exhibit 4.8 is \$456,520, summarized in Exhibit 4.9 as follows:

Exhibit 4.9: Difference Between Exhibit 4.7 and Exhibit 4.8 (Swing)

Difference (Swing) Discount Rate of 10% versus 4% and PJI of 7% Compounded Annually			
	(Parity) Exhibit 4.6	(Disc. Rate >Int. Rate) Exhibit 4.7	(Disc. Rate <Int. Rate) Exhibit 4.8
Discount Rate	10%	10%	4%
PJI Rate	10%	7%	7%
Rounding Disc. Damages	0	-3	-3
Difference	\$0	\$213,166	(\$243,354)
Swing		Difference \$456,520	

For the reader interested in the data used to generate the demonstrative exhibits, the computer spreadsheet model utilized for the case study is included as Exhibit 4.10.

⁴⁹ This situation could occur if then-current market discount rates are low but the prejudgment interest rate is set by law at a higher rate.

The choice of the *ex ante* as opposed to the *ex post* damages computation methodology can result in differing total damages as of the trial date, even though all other computational factors are identical, except for the prejudgment interest rate and the discount rate, including the manner of application of these rates. In practice, overall differences in total damages between the two methodologies are common and arise for three important reasons. First, as explained, the application techniques for the interest and discount rates are different. Second, opposing experts may use different interest and discount rates, even if the same periods of application and methods of compounding are applied. And third, the *ex ante* and *ex post* methods may use different damages modeling input factors (e.g., volume of lost sales and related net profits) other than the interest or discount rates.

Exhibit 4.10: Ex Ante v. Ex Post Compared to a 10% Discount Rate and 7% PJI Rate

Supporting Model - Ex Ante & Ex Post Compared at a Discount Rate of 10% and a PJI Rate of 7% Compounded Annually																				
Description	A		B		B - A = C		D		C - D = E		F		C - F = G		(For Graph Only)		H			
	Year	Actual	Proj/Actual	Buf/For	Damages	Dam/Cum	Ex Ante @ 10% discount rate	Ex Ante	ExAnteCum	n	Factor	Ex Post @ 10% discount rate	Ex Post	ExPostCum	Mark1	Mark2	PJI on Ex Post Dam	n	Factor	Ex Post
	1	\$1,000,000																		
	2	\$1,030,000																		
	3	\$1,061,000																		
	4	\$1,093,000																		
	5	\$1,126,000																		
	6	\$100,000	\$1,160,000	\$1,060,000	\$1,060,000	\$1,060,000	-0.5	0.9535	\$1,011,000	\$1,011,000	\$1,060,000	\$1,060,000	\$1,060,000	\$1,600,000			2.5	1.1843	\$195,351	
Lost Past Profits (3)	7	\$290,000	\$1,195,000	\$905,000	\$1,965,000	\$1,965,000	-1.5	0.8668	\$784,000	\$1,795,000	\$905,000	\$1,965,000	\$905,000	\$1,965,000			1.5	1.1068	\$96,669	
	8	\$460,000	\$1,231,000	\$751,000	\$2,716,000	\$2,716,000	-2.5	0.7880	\$592,000	\$2,387,000	\$751,000	\$2,716,000	\$751,000	\$2,716,000	\$1,600,000		0.5	1.0344	\$25,840	
Lost Future Profits (4)	9	\$670,000	\$1,268,000	\$598,000	\$3,314,000	\$3,314,000	-3.5	0.7164	\$428,000	\$2,815,000	\$598,000	\$3,286,000	\$598,000	\$3,286,000						
	10	\$860,000	\$1,306,000	\$446,000	\$3,760,000	\$3,760,000	-4.5	0.6512	\$290,000	\$3,105,000	\$446,000	\$3,673,000	\$446,000	\$3,673,000						
	11	\$1,050,000	\$1,345,000	\$295,000	\$4,055,000	\$4,055,000	-5.5	0.5920	\$175,000	\$3,280,000	\$295,000	\$3,905,000	\$295,000	\$3,905,000						
	12	\$1,240,000	\$1,385,000	\$145,000	\$4,200,000	\$4,200,000	-6.5	0.5382	\$78,000	\$3,358,000	\$145,000	\$4,009,000	\$145,000	\$4,009,000						
	13	\$1,427,000	\$1,427,000	\$0	\$4,200,000	\$4,200,000	-7.5	0.4893	\$0	\$3,358,000	\$0	\$4,009,000	\$0	\$4,009,000						
Prejudgment Interest						3	1.225		\$755,694		\$317,860		\$317,860			Total PJI			\$317,860	
Damages plus Prejudgment Interest Assuming a 10% Discount Rate and a 7% Prejudgment Interest Rate									\$4,113,694		\$4,326,860		\$4,326,860							

Reconciliation of the *Ex Ante* and *Ex Post* Methodologies

As illustrated above, opposing experts' opinions and methodologies can vary significantly. Experts and attorneys will address these differences during the litigation process at various points in time, including discovery, depositions, direct testimony, cross-examination, rebuttal testimony, and in expert reports.

The factors that cause differences between *ex ante* and *ex post* results can be delineated and explained. Inputs to the model can vary significantly between *ex ante* and *ex post* analyses because an *ex ante* analysis cannot include consideration of facts that became known subsequent to the violation (i.e., subsequent events), but an *ex post* analysis can take such events into consideration. For example, factors such as lost sales units, the sales price per unit, variable versus fixed expenses, and the resulting net lost profits could differ significantly between an *ex ante* and *ex post* analysis as a result of consideration of subsequent events.

The relevant time frames can also be different between *ex ante* and *ex post* analyses. For example, the above case study assumes that plaintiff was able to fully mitigate its damages by Year 13. However, all other factors being equal, consideration of subsequent events could change the estimated damages time frame. As the time delay between the violation and trial increases, the potential impact of subsequent events on the damages analysis increases.

Discount rates for *ex ante* and *ex post* models can vary. Theoretically, as discussed previously, a business valuation discount rate incorporates a risk premium for the uncertainty of possible *ex ante* outcomes. By considering the actual post-violation or *ex post* information, discount rates for an *ex post* analysis may be lower than discount rates for an *ex ante* analysis because actual post violation results reduce the level of uncertainty and risk during the post-violation time frame. As the time delay between the violation and trial increases, the potential impact of subsequent events on discount rates increases.

What cannot be resolved by quantitative methods between opposing experts is the fundamental difference in views between those academics and damages experts who respectively believe either the *ex ante* or *ex post* approach better measures lost business value or lost profits damages for a plaintiff. These two groups of individuals simply have opposing sets of intellectual philosophies and beliefs about which damages measurement methodology is better suited to evaluating the lost business value or lost profits. For example, proponents of the *ex ante* methodology often ardently argue that a plaintiff should not be compensated for risks it did not bear and should not be compensated for more than the loss as of the legal violation date. In contrast, proponents of the *ex post* methodology usually fervently contend that post-violation information should be used to ascertain the *intrinsic* or other value of the impaired asset as a result of defendant's legal wrongdoing, whether that value is better or worse than was expected when based upon *ex ante* information.

Conclusion

The *ex ante* and *ex post* concepts have historical roots dating back to medieval times in England, when disputes were resolved contemporaneously. Over the ensuing centuries, the time between the legal violation and recovery became increasingly extended. As a result of the delays, for more than a century case law emerged addressing the question of whether economic damages should be valued at the time of the legal violation or a later date (usually, the time of trial, as a proxy for the date of recovery). Over the past 25 years, the debate has intensified and received increasing attention by the courts, academics, and practitioners and currently remains unresolved. In fact, it may be unresolvable.

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Chapter 2 “Legal Principles for Lost Profits Damages and Related Expert Testimony”

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Ms. Seigle graduated from Harvard University (*magna cum laude* and Phi Beta Kappa) and from Yale Law School. She clerked for Judge Diarmuid O'Scannlain in the United States Court of Appeals for the Ninth Circuit.

Chapter 3 “Alternative Methodologies for Lost Profits Damages”

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Mr. Brinig holds accreditations in business valuation from the American Institute of Certified Public Accountants (AICPA) and the American Society of Appraisers (ASA) and has

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Mr. Brinig is the author of the law textbook *Finance & Accounting for Lawyers* (Portland, OR: BV Resources, 2011), and he is adjunct professor of law at the University of San Diego School of Law. He is the past president of the Financial Analysts Society of San Diego and has coauthored three other professional books and many articles on the subjects of forensic accounting and business valuation.

He holds a degree in business from Georgetown University and a law degree from the University of San Diego.

Chapter 4 “*Ex Ante* versus *Ex Post*”

Peter Schulman, CPA, CIRA, CDBV, has over 45 years of diversified accounting and consulting experience. He began his career in the Chicago office of Arthur Andersen. His primary emphasis is as a commercial damages and bankruptcy expert, with a subspecialty in computer forensics. Mr. Schulman has over 35 years of experience as a testifying expert on behalf of defendants, plaintiffs, trustees, creditors, debtors, and the court. He has been a frequent speaker on topics regarding lost profits damages and computer applications in litigation, including databases and graphic presentations of complex financial concepts.

Mr. Schulman has also been published in legal and accounting publications on a wide range of topics. One article was cited as an authority in a leading federal court case, *Energy Capital Corp. v. The United States*, 47 Fed. Cl. 382 (2000) and in *Recovery of Damages for Lost Profits*, Robert L. Dunn (6th ed.), as follows: “Some of the issues presented in discounting future damages have begun to receive treatment in scholarly articles. ... The question whether damages should be discounted to the date of trial or the date of breach is analyzed in Peter Schulman, *Economic Damages: Discounting Concepts and Alternatives*, 28 COLO. LAW. 41 (Jan. 1999).”

Chapter 5 “Business Valuation Methodology”

Claudia J. Stern, MBA, CPA, CFF, ABV, is a principal in the Forensic and Financial Consulting Services Group at Hemming Morse. She has worked on numerous business valuations, forensic accounting engagements, and economic damages matters involving a wide range of industries. Her valuation experience includes dissenting shareholder and partner actions, mergers and acquisitions, family law, and estate and gift matters. Her forensic accounting engagements have included breach of fiduciary duty claims, fraud, bankruptcy, alter ego, and malpractice actions. She teaches for the California Society of CPAs (CalCPA) and Golden Gate University.

Ms. Stern has a bachelor's degree in physics from Whitman College and a master's degree in business administration from Harvard University.

James A. Andersen, MBA, CPA, CFF, ABV, ASA, is a partner at Hemming Morse, a CPA firm providing forensic and financial consulting services. His career spans more than 40 years, during which he built one of the largest full-service accounting firms in Northern California. Over the past three decades, he has focused his extensive tax background on issues of business valuation, financial consulting, and forensic consulting. A nationally recognized leader in

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Chapter 6 “Contrasting the Lost Business Value and Lost Profits Methodologies”

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Mr. Fancher earned his BBA in finance from Texas A&M University and his MBA from Baylor University.

Everett P. Harry, III, MBA, CPA, CFF

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Chapter 7 “Proving Loss Causation”

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Chapter 8 “Industry and Economic Research”

Victoria A. Lazear, MS, is a senior advisor at Cornerstone Research and has more than 30 years of experience applying economic theory to issues in litigation and regulation. She provides expert testimony and directs research for expert testimony in a range of practice areas, including labor, antitrust, securities, and financial institutions. She has assessed economic losses and loss causation for cases in the telecommunications, high-technology, energy, pharmaceutical, chemical, and financial industries.

Prior to joining Cornerstone Research, Ms. Lazear was a founder and president of Applied Economics Partners (AEP), a litigation consulting firm. AEP provided economic analysis and litigation consulting services across a range of practice areas. Before founding AEP, Ms. Lazear was a vice president of Cornerstone Research, where she helped develop the firm's intellectual property practice. She has lectured on the economic analysis of damages and has taught the economics of regulation and public utilities at the Graduate School of Business at the University of Chicago. In addition, Ms. Lazear coauthored with Mark Allen and Robert E. Hall “Reference Guide on Estimation of Losses in Damages Awards” in the *Reference Manual on Scientific Evidence*.

Chapter 9 “Statistics in Lost Profits Measurements”

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Dr. Crain has been a licensed CPA for over 30 years and has been a full-time practitioner most of that time. He holds several certifications in valuation: Accredited in Business Valuation (ABV) from the American Institute of Certified Public Accountants (AICPA) and the designation of Chartered Financial Analyst (CFA) from the CFA Institute. He is also a Certified Fraud Examiner (CFE), a past chairman of the AICPA business valuation committee, and has been

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G. William Kennedy, PhD, CPA, ABV, is a managing director in the Boston office of Duff & Phelps. He has over 30 years of professional experience, including serving as a partner with a regional CPA firm and holding managing director positions with global litigation consulting firms. For the past 20 years his practice has focused on business valuation and litigation support services where he has testified in numerous state and federal courts and before international arbitration tribunals. Additionally, he has held various academic positions, including the rank of associate professor of finance (with tenure).

Dr. Kennedy is a 2003 inductee into the American Institute of Certified Public Accountants (AICPA) Business Valuation Hall of Fame. He is the former chair of both the AICPA ABV Credentials Committee and the AICPA ABV Examination Committee and was also a member of the AICPA M&A Disputes Resolution Taskforce. He is currently a member of the American Society of Appraisers' (ASA) *Business Valuation Review* Editorial Review Board.

Dr. Kennedy has a PhD in finance from Saint Louis University and a BS and MAS in accounting from the University of Illinois. He holds the ABV designation from the AICPA, earned during the inaugural year of the ABV program. He currently serves as adjunct professor for the graduate accounting program at Florida Atlantic University, where he teaches a course on fair value measurement.

Chapter 10 “Analysis of Projected Lost Revenue”

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S. Benjamin Solomon, MS, CPA, is a manager with Deloitte Financial Advisory Service's Forensic and Investigations practice, with over eight years of experience. He specializes in providing litigation support to his clients, including complex economic damages calculations, lost profits analyses, accounting malpractice litigation, and business insurance claims. He also has extensive experience in purchase price disputes, corporate investigations, and FCPA due diligence and investigations. His experience has exposed him to a variety of industries in the public and private sectors, including financial services, consumer and industrial products, energy, healthcare, and real estate.

Mr. Solomon received a BBA in accountancy from the University of Notre Dame and a master of science in accountancy from the University of Notre Dame. He is a certified public accountant (CPA) in Illinois.

Claudia A. Wolf, CPA, CFF, CFE, was a partner in the Chicago office of Deloitte Financial Advisory Services (Deloitte FAS). She retired from Deloitte FAS in September 2015. At the time of her retirement she served as the national director of the firm's Business Insurance Consulting practice. She has 32 years of experience in insurance claims accounting. She has spent her career performing analysis of financial and operating data necessary for the determination and verification of losses sustained due to property and casualty losses and other disruptions to businesses in a considerable range of industries. Types of engagements include business interruption, contingent business interruption, extra expenses, inventory, physical damage, reconstruction projects, product recall, and third-party liability disputes.

Ms. Wolf has assisted clients with the development of their damages related to many catastrophic situations, including 9/11, hurricanes Katrina and Rita, the earthquake/tsunami in Japan, the flooding in Thailand, and Superstorm Sandy on the East Coast. She has also gained experience in litigation through expert witness testimony on subrogation, motive for arson, and other insurance-related issues testifying in state and federal courts throughout the country and in international arbitration.

Chapter 11 “Analysis of Cost Behavior”

Elizabeth A. Eccher, MS, PhD, is a principal at Analysis Group. Previously, she taught financial and managerial accounting at the Sloan School of Management at Massachusetts Institute of Technology and worked in the heavy equipment industry as a pricing and cost analyst. Dr. Eccher received her doctorate in accounting from Northwestern University and holds an MS in industrial administration from Purdue University and a BA in economics from Dominican University. Her consulting and/or testifying experience includes interpretation of financial accounting standards, damages estimation for lost sales, cost analyses, and financial analyses for transfer pricing.

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Chapter 12 “Mitigation of Damages in the Lost Profits Calculation”

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Mr. Pollack holds a master’s degree in finance from Florida International University and a BBA from the University of Miami, where he is actively involved with alumni groups, scholarships, and serves as an advisory board member. He holds more than 10 professional credentials and certifications, including a Florida certified public accountant (CPA) license, an Accredited in Business Valuation (ABV), Certified Fraud Examiner (CFE), and others. A highly regarded public speaker, he has taught judges, lawyers, accountants, college students, regulators, and business people throughout his career.

Chapter 13 “Using Net Cash Flow versus Accrual Net Income”

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Prior to joining Analysis Group, Dr. Strombom was executive vice president of a mid-

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Sheryl Clark, MA, is an associate at Analysis Group. She has over a decade of litigation support experience involving accounting, financial, statistical, and economic analysis. Ms. Clark has consulted in areas such as accounting, intellectual property, entertainment and media, statistical sampling, healthcare, business valuation, class certification, ERISA, and general commercial litigation. She has extensive experience with financial modeling and assembling, managing, and analyzing large complex proprietary and public databases. Ms. Clark holds an MA in economics, a BA in quantitative economics, and a minor in studio art from Tufts University, as well as a general business studies with accounting concentration certificate from University of California, Los Angeles.

Chapter 14 “Period of Damages”

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Chapter 15 “The Ability to Achieve Lost Sales as a Consideration in Damages Analyses”

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Ms. Kirk Fair also has extensive experience analyzing questions of market definition, market power, and pricing in competition matters including mergers and monopoly antitrust investigations. In addition, she has extensive experience in the development, administration, and analysis of surveys in antitrust, false advertising, and intellectual property matters, as well as strategy cases.

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Chapter 16 “Present Value Concepts and Damages Modeling”

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Chapter 17 “Discount Rates in Theory”

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Chapter 18 “Discount Rates in Practice”

Everett P. Harry, III, MBA, CPA, CFF

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Mr. Hayden co-chairs the America Institute of Certified Public Accountants (AICPA) Task Force on Valuing Portfolio Companies Held by Investment Funds. He is a frequent presenter and author on valuation topics. He is a Chartered Financial Analyst (CFA) charterholder from the CFA Institute and an Accredited Senior Appraiser (ASA) from the American Society of Appraisers. He holds an Accreditation in Business Valuation (ABV) from the AICPA. Mr. Hayden holds an MBA from the University of California, Davis and California State University, East Bay and a bachelor’s degree from Western Michigan University.

Wallace Ng, CFA, is a senior manager in the Advisory Services practice of Deloitte Transactions and Business Analytics in Los Angeles. He has over 15 years of financial consulting experience providing valuation and consulting services across diverse industries. Mr. Ng has performed valuations of business enterprises, business interests, and intangible assets for the purposes of financial reporting, mergers and acquisitions, restructuring, bankruptcy, tax reporting and planning, and litigation support for trials and arbitrations. Prior to Deloitte, Mr. Ng was a manager in the Financial Advisory Group of Kroll, providing valuation and consulting services to help clients mitigate business and financial risks and achieve their operational and financial objectives. Prior to his tenure at Kroll, Mr. Ng worked at Charles River Associates, an economic consulting firm, where he performed valuations and economic analyses for the purposes of mergers and acquisitions, restructuring, bankruptcy, and litigation support for state and federal courts.

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Chapter 19 “Before-tax versus After-tax Discount Rates”

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Ms. Wong was formerly with TM Financial Forensics and Tucker Alan, where she performed similar work. She holds dual BA degrees in economics and legal studies from the University of California, Berkeley.

Chapter 20 “Pre- and Post-judgment Interest”

Gregory A. Pinsonneault, MA, CLP, is a managing director and the chief executive officer at LitiNomics. He has more than 14 years of experience providing consulting services and expert testimony for economic, financial, and business issues related to commercial litigation, primarily in the calculation of economic damages. Mr. Pinsonneault has extensive experience in intellectual property disputes, including patent, trade secrets, copyright, and trademark disputes, as well as consulting on reasonable license terms for intellectual property outside the context of litigation. He has also consulted in a variety of other areas, including breach of contract, class-action issues, predatory pricing and buying, and antitrust monopolization.

Mr. Pinsonneault holds an MA in economics from the University of California, Berkeley, a BA in mathematics and economics (*cum laude*) from the University of Washington, and a BS in computer science (*cum laude*) from the University of Washington. He is a Certified Licensing Professional (CLP).

Christian Tregillis, CPA, ABV, CFF, CLP, is a partner with Hemming Morse. In this role he analyzes financial, accounting, economic, statistical, and market issues, primarily in regard to disputes and valuations, including the negotiation of license agreements covering intellectual property. He has participated in mediations and has testified in depositions, hearings, arbitrations, and at trial in state and federal courts.

Mr. Tregillis has worked on over 500 matters in his 25 years of financial consulting and investigations, including 11 years at major international and national accounting firms. He was previously the leader of the Damages, Valuation, and IP practice area globally for LECG. Prior to that he led the Forensic Accounting and Litigation Consulting Group in the Western U.S. for Kroll and was the leader of Kroll's Intellectual Property Services practice. Before his work at Kroll, he was a partner in the Financial Advisory Services practice at Deloitte & Touche.

Mr. Tregillis is a past chair and current member of the Economic Damages Task Force of the American Institute of Certified Public Accountants (AICPA); he is also a past chair of the Economic Damages Section of the California Society of Certified Public Accountants (CalCPA).

Chapter 21 “The Expert Report”

R. Christopher Rosenthal, MBA, CPA, ABV, CFF, ASA, AEP, is a director in Ellin & Tucker's Forensic and Valuation Services Group, with more than 30 years of experience. He is responsible for hundreds of domestic and international commercial damage and valuation engagements throughout the United States, Europe, South America, and the Middle East. He has extensive experience preparing expert reports and providing testimony in federal, state, and international courts. He has worked on cases ranging from simple contract disputes involving thousands of dollars to complex litigation, where the claims being sought involved nearly half a billion dollars. Mr. Rosenthal specializes in complex commercial damages, valuation, intellectual property, and forensic accounting assignments. His clients have included public and private companies of various sizes, not-for-profit organizations, governmental entities, and individuals.

Mr. Rosenthal has a BS in accounting from Virginia Tech and an MBA in finance from the University of Maryland. Prior to joining Ellin & Tucker, he was a financial analyst with a national poultry company and had four years of public accounting experience.

Chapter 22 “Expert Reports and Business Valuation Standards”

Everett P. Harry, III, MBA, CPA, CFF

See book editor's bio.

William B. Stewart, Jr., CPA, ABV, CFF, CFE, is a member of Stewart & Hurst, a consulting firm providing forensic and valuation services to attorneys and their clients and a number of industries in non-litigation matters. Mr. Stewart has been a certified public accountant (CPA) for over 40 years, having been both a professional at a major public accounting firm and then chief financial officer for several large companies in the industry before beginning his current practice over 25 years ago. He is a frequent speaker at local, state, and national conferences, university guest lecturer, and coauthor of several publications. Mr. Stewart has testified in criminal, family law, bankruptcy, and civil matters in county, state, and federal courts in Texas, Utah, Tennessee, Florida, and Colorado.

Chapter 23 “Legal Challenges to Lost Profits Damages Expert Testimony”

Stephen Mahle, JD, PhD, is Associate Professor of Economics at Hiram College, where he teaches econometrics, law and economics, and economic theory. He is also a commercial litigator with *DaubertCounsel*, concentrating his legal practice on litigating *Daubert* issues in scientific and non-scientific expert testimony for law firms and insurance companies. A substantial part of this practice is counseling testifying expert witnesses on how the specifics of *Daubert* impact their testimony. His practice centers on the evaluation, proffer, and admission (or challenge and exclusion) of scientific, technical, and other expert testimony under *Daubert v. Merrell Dow*, *Frye v. United States*, and the other standards for admissibility of expert testimony. Dr. Mahle has been a finance professor at the University of Iowa, Florida Atlantic University, and Virginia Tech; and an Olin Scholar in Law and Economics at the University of Virginia School of Law. His litigation practice focuses on controlling admissibility of economics, damages, and scientific expert testimony and has included: securities and commodities litigation, such as 10b-5, arbitration, and SRO proceedings; intellectual property, products liability, medical malpractice, personal injury, construction defects, and employment litigation; and M&A. This practice involves econometric analysis of expert testimony and legal analysis of experts' econometrics. Some of his work is collected at *DaubertCounsel.com*. Steve was a lobbyist for Florida's 2013 *Daubert* legislation and in September 2016 argued the resulting case, *In Re: Amendments to the Florida Evidence Code before the Florida Supreme Court*, <http://www.floridasupremecourt.org/decisions/2017/sc16-181.pdf>.