PART IV

ANCILLARY ISSUES IN DAMAGES MATTERS

CHAPTER 16

PREJUDGMENT INTEREST*

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CONTENTS

16.1 INTRODUCTION

Litigants often turn their attention to prejudgment interest only toward the end of a lawsuit. They are often weary, overextended (in terms of their financial and other obligations), and in a rush to conclude the matter. Many address the issue only as an afterthought. Such an attitude can prove to be an expensive mistake because many jurisdictions grant courts wide discretion in calculating prejudgment

* The authors acknowledge the seminal work in this area: James M. Patell, Roman L. Weil, and Mark A. Wolfson, "Accumulating Damages in Litigation: The Roles of Uncertainty and Interest Rates," *Journal of Legal Studies* 11 (June 1982): 341–64. They also acknowledge Roman L. Weil's chapter titled "Compensation for the Passage of Time," which appeared in the second edition of the *Litigation Services Handbook* (1995) and "Compensating the Plaintiff for Asynchronous Payments," which appeared in the 2004 and 2005 *Cumulative Supplement of the Litigation Services Handbook*. This chapter contains material drawn from Weil's chapters.

interest. Thus, lawyers and experts who understand the financial concepts involved can provide substantial value to their clients when attention turns to the calculation of prejudgment interest.[1]

An expert working on prejudgment interest should first ascertain how the relevant jurisdiction views the issue. In the United States, no single set of rules guides prejudgment interest. Instead, different rules apply depending on the jurisdiction and perhaps the cause of action under which the plaintiff seeks recovery. Many states have prescribed simple rules. For example, some states set a fixed prejudgment interest rate by statute; others tie the rate to an established index. In these instances, the courts must decide only the length of the prejudgment period.[2]

Litigants and their experts face a different situation under federal law, which has no mandated prejudgment interest rate or index. Instead, federal courts have long recognized prejudgment interest as an element of complete compensation. Below we explain why a court should grant prejudgment interest in the amount that returns the plaintiff to the position it would have been in had the defendant compensated it immediately after injuring it.[3] Courts and commentators have also pointed out that prejudgment interest plays an important role in preventing defendants from unjust enrichment.

Although courts have articulated a broad principle—make the plaintiff whole—they have left open the method of calculating prejudgment interest. In an attempt to fill that gap, commentators have proposed a variety of different methods, but the federal courts have not consistently adopted any single approach. Moreover, the Supreme Court's pronouncement in *Kansas v. Colorado*, 533 U.S. 1 (2001), makes clear that lawyers and their experts have latitude in trying to persuade a court of the amount of prejudgment interest that the defendant should pay.[4]

The monetary stakes can be substantial when the injury occurred long before the judgment; prejudgment interest can exceed the original judgment. For example, in its 1986 complaint against Colorado, Kansas sought $9 million in damages going back to 1950, plus $53 million in prejudgment interest. In 1992, the Seventh Circuit awarded $65 million in damages and $148 million in prejudgment interest in a suit arising out of the grounding of the supertanker *Amoco Cadiz* off the coast of Brittany on March 16, 1978.

Even when the legal resolution occurs quickly, a large judgment will carry a large prejudgment interest amount—even more so when interest rates are high. Because of compounding, even small differences in interest rates can have large effects on the final award. For example, in *Amoco Cadiz*, a one-percentage-point (100 basis points) increase in the interest rate would have increased the final award by $20 million. For these reasons, the methods that courts use to calculate prejudgment interest have important practical significance.

This chapter describes the basic principles that courts should apply in calculating prejudgment interest in order to compensate a plaintiff completely and extends that analysis to cover a range of special circumstances that frequently arise. This chapter is neither a compendium of the case law nor a survey of the different positions advanced by commentators. Although we discuss cases and other methods when appropriate, this chapter describes what we believe is the proper method of calculating prejudgment interest based on sound financial principles.

16.2 THE PROBLEM

Courts most often assess the final award by first calculating a multiplier (denoted by m), which, when applied to the original judgment (J), produces the final judgment (FV):

$$FV = J \times m$$

Thus, once it has decided liability and calculated the original judgment, the court must set the multiplier.

Courts often compute the multiplier, m, as follows:

$$m = \left(1 + \frac{r_m}{n}\right)^{nT}$$

where

r_m is the prejudgment interest rate,
n is the number of compounding periods in a year, and
T is the prejudgment period in years.

Accordingly, setting the multiplier entails three tasks:

1. Set the prejudgment interest rate (r_m)
2. Calculate the prejudgment period (T)
3. Determine the frequency with which to compound interest (n)[5]

16.3 WHICH INTEREST RATE? THE DEFENDANT'S COST OF UNSECURED BORROWING

Courts award prejudgment interest to place both the plaintiff and the defendant in the same position that they would have been in had the defendant compensated the plaintiff immediately after the injury. In awarding prejudgment interest, courts describe their task as looking for the interest rate that will compensate the plaintiff for delay.

This chapter assumes that both parties are publicly traded corporations, or similar entities such as mutual funds, hedge funds, or private equity funds, with ready access to the capital markets. We also assume that the corporations' or funds' investors hold diversified investment portfolios and therefore tie up little of their wealth in the litigating corporations. Section 16.9 briefly discusses how to adjust the calculations when the plaintiff is a close corporation or an individual.

The search for the appropriate interest rate begins by examining the plaintiff corporation's balance sheet (using market, not book, values). As a result of the defendant's wrongdoing, the plaintiff either lost an asset or incurred an additional liability. Either effect would reduce the plaintiff's net worth.

The judicial system compensates the successful plaintiff with a monetary award, an asset. If the award was immediate (and costless to obtain), an award equal to the harm would offset the entire injury, leaving the plaintiff's net worth

unchanged. Because the plaintiff does not receive an immediate judgment, the court awards prejudgment interest so that the present value of the eventual judgment equals the present value of the harm.

The assumption that the parties have ready access to the capital markets now comes into play. The term *judgment asset* means the claim that the plaintiff has against the defendant when the defendant injures the plaintiff is later replaced with an award from the court. The court must set the return on the judgment asset so that the value of the judgment asset will equal that of the lost asset or offset the new liability. As with other assets, the value of a judgment asset to a plaintiff does not depend on the plaintiff's characteristics but rather on the asset's risk and return.

The judgment asset is subject to two risks, only one of which should be compensated through prejudgment interest. The first risk is that the courts will not uphold the plaintiff's claim, or, even if they do, they will not grant the plaintiff a judgment that fully compensates for its injury. Although this problem and its solution—for the court to increase its judgment by dividing the harm by one minus the probability of error—are well known in the law-and-economics literature, successful plaintiffs do not receive compensation set by the courts increased for the possibility that they, the courts, might have erred.[6] Moreover, the risk of judicial error lies conceptually outside of the realm of prejudgment interest; one should address it before the calculation of prejudgment interest. Accordingly, courts should not increase the prejudgment interest rate to reflect the risk of judicial error.

The second risk is that the court will grant the plaintiff a judgment equal to its harm but that the plaintiff will not collect the full judgment because the defendant goes bankrupt. Accordingly, if courts fail to compensate plaintiffs for the risk that defendants default, they will undercompensate plaintiffs and enrich defendants. Therefore, to put plaintiffs and defendants back into their positions before the injury occurred, plaintiffs must receive compensation for the risk that defendants will default. This approach was first elucidated in *Patell, Weil, and Wolfson* (1982) and was endorsed by the Seventh Circuit in *Gorenstein Enterprises, Inc. v. Quality Care-USA, Inc.*[7] Accordingly, the prejudgment interest rate should reflect the risk that the defendant defaults.

As with other debt, the risk that a plaintiff will not collect its debt (the judgment) does not depend on the plaintiff's assets, liabilities, riskiness, or capital structure but rather on the defendant's assets, liabilities, riskiness, and capital structure. The interest rate that reflects the risk that the defendant does not pay its debts is the defendant's borrowing rate. In bankruptcy, courts treat legal claims on par with unsecured debt. Therefore, to compensate the plaintiff for delay, the court should award prejudgment interest at the defendant's unsecured borrowing rate. Such an award will allow the judgment asset to grow at the interest rate appropriate for the risk the plaintiff bears: the risk that the defendant will default on the judgment.

Some commentators refer to this approach to prejudgment interest as the *coerced loan theory*. That phrase underscores the notion that the defendant, by not immediately compensating the plaintiff for its harm, has in effect forced the plaintiff to make a loan to the defendant equal to the plaintiff's harm. Accordingly, compensating the plaintiff for the delayed repayment requires that the court award prejudgment interest at the rate that the defendant would pay a voluntary creditor on an otherwise identical loan.

(a) Alternative Rates Do Not Properly Compensate Plaintiffs

Some courts, litigants, and commentators have not accepted the coerced loan theory. The alternative rates they propose include the return on the plaintiff's equity, the plaintiff's cost of capital, the plaintiff's cost of debt, the return on a market index, and the risk-free interest rate. One can divide these proposals into three groups, depending on whether the court bases prejudgment interest on (1) the plaintiff's return on investment, (2) the plaintiff's cost of raising funds, or (3) an interest rate that is independent of both plaintiff and defendant. Some prominent courts (e.g., the Delaware Court of Chancery) have not embraced the coerced loan theory and award interest employing other methods.

(i) Return on Plaintiff's Capital Keir and Keir (1983) argue that the court should assess prejudgment interest at the average return on the plaintiff's equity. Their proffered rationale: had the plaintiff collected the funds, it would have invested in its own business; therefore, the return that the business has produced provides the best measure of the amount the plaintiff lost through delay.

This argument ignores our assumption that the litigants (especially the plaintiff) are two publicly traded companies with ready access to capital markets. Given that assumption, one cannot claim that the defendant's actions prevented the plaintiff from forgoing any attractive investment opportunities and forced the plaintiff to forgo the resulting return. If the plaintiff did not have the capital to pursue a desirable project, it could have raised the funds through the capital market.

(ii) The Plaintiff's Cost of Capital Keir and Keir (1983) also argue that the minimum prejudgment interest rate is the plaintiff's cost of capital; for a firm with both debt and equity, this equals its weighted average cost of capital.[7] Awarding prejudgment interest at the plaintiff's cost of capital aims to compensate the plaintiff for the cost of tying up its capital. The proponents of that approach reason that awarding prejudgment interest at the plaintiff's cost of capital compensates the plaintiff for the cost it incurred to raise the funds denied it by the defendant's wrongdoing. Arguments against this alternative also apply to the plaintiff's cost of borrowing, which we discuss next.

(iii) The Plaintiff's Cost of Borrowing Closely related to the plaintiff's cost-of-capital alternative, some argue that courts should award prejudgment interest at the plaintiff's cost of borrowing. Proponents reason that if the injury did not prevent the plaintiff from undertaking any investment, then it most likely caused the plaintiff to increase its borrowing (because public firms rarely issue new equity, but they often borrow). Accordingly, to return the plaintiff to its uninjured state, the defendant should pay interest to the plaintiff at the plaintiff's cost of borrowing additional funds.

Arguments that look to the plaintiff's cost of raising funds (whether cost of capital or borrowing rate) have an obvious intuitive appeal, but they also have problems. Sometimes the injury does not cause the plaintiff to raise additional funds. The plaintiff nevertheless suffers harm because of the defendant's delay in compensating the plaintiff and the risk that the defendant will go bankrupt before paying the plaintiff.

Suppose the plaintiff raises additional funds by issuing debt.[8] In such instances, the interest rate that the plaintiff pays for that new capital will reflect the risk borne

by those new investors. That risk depends on the assets they can look toward for repayment and their priority. Only in rare instances do the new investors invest solely in the claim. In such cases, the new investors bear the same risks as those borne by the plaintiff; one can then measure the cost to the plaintiff of waiting as the interest rate the plaintiff pays to its new investors to bear that risk.[9]

In contrast, when the new investors do not look solely to the claim for repayment, then the risk they bear and hence the interest rate that the plaintiff pays will not reflect the harm caused to the plaintiff by delay. In these circumstances, the interest rate that the plaintiff pays the new investors will reflect their position in the plaintiff's capital structure. If the interest rate that the plaintiff pays its new investors exceeds the defendant's unsecured borrowing rate, it is because the plaintiff's new investors will assume not only the defendant's default risk, but other additional risks as well, for which they demand compensation in the form of a higher interest rate. The defendant should not have to compensate the plaintiff for risks unrelated to the litigation that the plaintiff transfers to new investors. Alternatively, if the defendant's cost of unsecured borrowing exceeds the interest rate that the plaintiff pays to outside investors, then the new investors do not assume the defendant's entire default risk and the plaintiff retains some of the risk of the defendant's default. The court should not fail to compensate the plaintiff for the risk it bears due to the defendant's wrongdoing because the plaintiff raised additional capital without transferring all of that risk to its new investors.

(iv) The Return on a Market Index Plaintiffs sometimes seek to receive prejudgment interest at the rate that they would have earned had they received the funds earlier and invested them in a diversified portfolio of stocks. The logic is that if the plaintiff received the funds immediately, it could have distributed them to its shareholders, who would have reinvested them. The return on the market portfolio offers a reasonable market-based return for a diversified investor.

This argument has several problems. First, in the context of litigation between two publicly traded companies, the defendant's actions do not prevent the plaintiff's shareholders from cashing out their stock and investing in a diversified portfolio. They can sell their stock and invest their proceeds as they please. They can also adjust their other investments if they want to increase or decrease their risk exposure.

Second, the return on a diversified portfolio of stocks reflects the risk of that portfolio. That, however, is not the investment that the plaintiff has made (albeit involuntarily) with the funds held by the defendant. Instead, the plaintiff has, perforce, invested them in the defendant's unsecured debt and should receive a corresponding risk-adjusted return. Giving the plaintiff a different return, based on the risk of a diversified portfolio of stocks, does not compensate the plaintiff for the risk it bore through its forced investment in the defendant.

(v) Risk-Free Rate Fisher and Romaine (1990) argue that the court should award prejudgment interest at the U.S. Treasury bill rate—the interest rate that the federal government pays when it borrows. They reason that U.S. courts do not compensate plaintiffs for the risks of litigation and that the possibility of the defendant going bankrupt is a risk of litigation.

Weil (1995) has two cogent responses to that argument. First, Fisher and Romaine's argument—that courts should not compensate plaintiffs for litigation

costs—does not imply that courts should award prejudgment interest at the risk-free rate. Taken to its logical conclusion, Fisher and Romaine's argument implies that courts should never award prejudgment interest, not that they should award prejudgment interest at the risk-free rate. Because that result conflicts with statutory law, case law, and the logic behind prejudgment interest, one should reject the argument. Second, awarding prejudgment interest at a fixed or variable rate independent of the defendant's cost of unsecured debt (such as the risk-free rate) will encourage defendants to increase their risk. The defendant, through its choice of investments, has some control of its bankruptcy risk. If the prejudgment interest rate does not reflect that risk, the defendant, by increasing that risk, will be able to shift some portion of the costs of risky undertakings to the plaintiff. This is an unnecessary and undesirable feature of a judicial system.

(b) ~~Recent~~ Criticisms of the Coerced Loan Theory Are Unpersuasive

Several commentators have criticized the proposal to award prejudgment interest at the defendant's unsecured borrowing rate. We examine two of these criticisms.

Escher and Krueger (2003) employ a cost-of-carry pricing model. They argue that the plaintiff's claim for damages, or lost profits (i.e., the judgment asset), is in essence a forward contract that is traded at the time of the harm. The forward contract entitles the plaintiff to receive an amount in the future when the court renders the judgment. The delivery price of such a contract—the amount to be exchanged in the future—is simply today's price (i.e., the harm incurred by the plaintiff) plus the cost of carry. In their model, the cost of carry is the plaintiff's implied financing cost or cost of debt capital. Escher and Krueger's insightful cost-of-carry approach supports the coerced loan theory rather than undercutting it. In the absence of default risk, the delivery price of a forward contract is the spot (or today's) price plus the risk-free rate. As Escher and Krueger note, however, if default risk exists, the difference between the spot price and delivery price should reflect that risk. In the litigation context, because only the defendant can default, only the defendant's default risk matters. Thus, the cost-of-carry model leads back to awarding prejudgment interest at the defendant's cost of unsecured debt.[10]

Barondes (2004) takes a different tack. He argues that the coerced loan theory fails to distinguish between the plaintiff's equity holders and creditors. Drawing on the idea of asset substitution in corporate finance (Jensen and Meckling, 1976), Barondes notes that the judgment asset, even if it has the same present value as the asset that the plaintiff lost (or the liability it incurred), it will likely have different risk characteristics. Substituting a riskier asset for a less risky asset with the same present value will usually transfer value from the plaintiff's debt holders to equity holders, and conversely. As a result, awarding prejudgment interest at the defendant's cost of unsecured borrowing will not restore the plaintiff's equity holders and debt holders to their positions before the injury occurred. If the judgment asset is riskier than the asset it replaces, equity holders will typically gain at the expense of debt holders, and conversely. The possibility of such a transfer, however, does not provide a basis for rejecting the coerced loan theory. Modern finance rejects the view, implicit in Barondes's argument, that equity holders are the only investors in the firm. Instead, in the contemporary view, debt and equity are alternative methods of investing in a firm, and the firm's investors

are the injured parties. Accordingly, awarding prejudgment interest at the defendant's unsecured borrowing rate will allow debt holders and equity holders taken together to receive full compensation for the risk of the judgment asset without being overcompensated. Using any other interest rate to calculate the final award will either overcompensate or undercompensate some investors in the plaintiff.

16.4 AWARDING PREJUDGMENT INTEREST AT A FLOATING INTEREST RATE

Interest rates usually vary with the duration of an investment. Practitioners refer to the observed pattern of interest rates from now to various future times as the *term structure of interest rates*. Typically, long-term rates exceed short-term rates, producing an upward-sloping term structure. Exhibit 16-1 shows the Treasury yield curve on July 22, 2016, with the yield to maturity increasing with maturity.

When, as normally occurs, the term structure is not flat, the court must decide whether to use a series of short-term rates or a single long-term rate. Consider, for example, a plaintiff who suffers an injury on January 1, 2007, and receives payment on January 1, 2017. The court, looking backward from the year 2017, might apply the 10-year rate for debt issued by the defendant in 2007 maturing in 2017, or it might apply a series of 10 one-year rates—one for 2007, one for 2008, and so on, through 2017. Because the term structure is not usually flat and because it shifts over time, these two choices will give different answers. Typically, the single 10-year rate will exceed the rate compounded from 10 one-year rates. Should the court use the 10-year rate or the rate compounded from 10 one-year rates? Finance does not provide an answer because either method, if established before the injury occurred, would compensate the plaintiff.[11] Knoll (1996), however, argues that the need of the court system to encourage parties to settle their disputes favors the use of short-term interest rates.

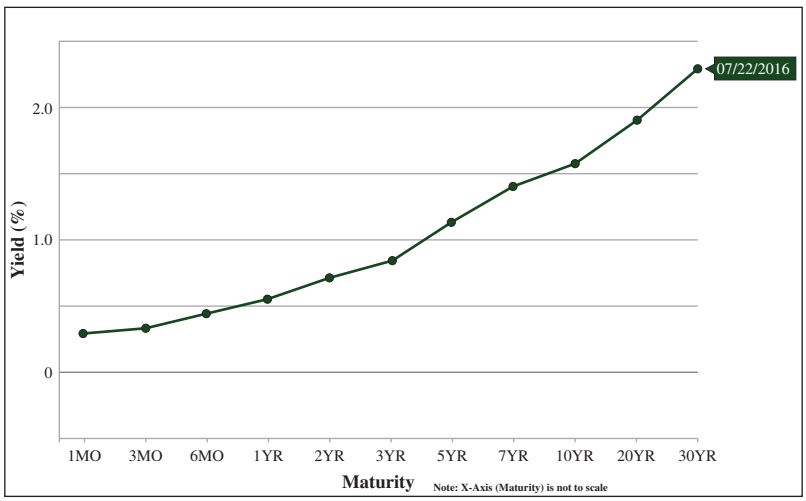

Exhibit 16-1. U.S. Treasury Yield Curve for July 22, 2016

If courts used long-term interest rates, they would interfere with the parties' incentives to settle. If interest rates rise during litigation, defendants will be in effect borrowing at below-market interest rates, which will give them an incentive to prolong litigation. Falling interest rates reverse the incentives. Thus, although one party's incentive to delay is matched by the other party's incentive to expedite, it is easier for one party acting unilaterally to delay litigation than to expedite it. In contrast, short-term rates give neither party an advantage or disadvantage from delay and thus encourage settlement relative to using long-term rates.

The upward-sloping term structure reflects the increasing interest rate risk from fixing an interest rate at the start of ever longer loans. Because courts set prejudgment interest *ex post*,[12] after the events have occurred and all interest rates are known for all past periods, the investor (the plaintiff) bears no risk that those past interest rates will change. Accordingly, courts should calculate prejudgment interest using a series of short-term rates, short enough not to include a premium for interest rate risk. This implies computing prejudgment interest based on floating, variable, or adjustable rates, not on fixed rates.

Losey, Mass, and Li (2002) disagree. They argue that short-term interest rates will neither discourage foot-dragging nor compensate plaintiffs. Instead, they propose that courts should award prejudgment interest at a variable rate with a term premium. That premium serves two functions: compensating the plaintiff for the risk of the defendant defaulting and compensating the plaintiff for tying up the plaintiff's capital. To the extent that the premium compensates for the risk of default, Section 16.3 discusses that issue. Here, we discuss only compensation for extending credit for a period of time.

The standard explanation for the persistence of the upward-sloping interest term structure is that borrowers have shorter time horizons than lenders. Consequently, borrowers want to lock in the interest rates they pay for long periods of time, whereas lenders prefer to have the flexibility to withdraw funds and reinvest at prevailing market interest rates. Accordingly, to induce borrowers to invest their capital for a long period, borrowers must pay lenders a premium. One must distinguish between a term premium and a liquidity premium. Because corporate bonds are less liquid, their expected return includes both a term premium and a liquidity premium to compensate for the lack of liquidity. Holders of long-term federal government securities, however, do not have to tie up their funds because such securities have a liquid market. Holders of one-year bonds can get their funds in one year; holders of 10-year bonds can also get their funds in one year, by selling their bonds. The latter, however, face more risk because the price they receive for their bonds will depend on the nine-year interest rate in one year. The term premium reflects this risk, which one can avoid by granting prejudgment interest at a variable or floating interest rate.[13]

16.5 ESTIMATING THE DEFENDANT'S UNSECURED FLOATING BORROWING RATE

We have discussed the coerced loan theory, which posits that courts should award prejudgment interest at the interest rate that the defendant would pay on an otherwise equivalent voluntary loan. Because a judgment award carries the same risk

as that of an amount owed unsecured creditors in bankruptcy, courts should grant prejudgment interest at the interest rate that the defendant would pay for unsecured debt to compensate the plaintiff for the risk of default. To avoid the possibility of having both a large winner and a large loser when interest rates change, the court should grant prejudgment interest at a floating or variable interest rate.

Courts can use several methods to estimate the interest rate that the defendant would pay on an otherwise identical voluntary loan. We discuss three methods that parties can propose and courts can easily implement. Although none of the methods will yield a precise, theoretically correct answer, they will produce credible and defensible approximations when done with some care.

The coerced loan theory states that the prejudgment interest rate should reflect the risk to the plaintiff that the defendant will default. The first and most obvious proxy is a floating interest rate at which the defendant had or could have borrowed unsecured funds. For companies that can borrow large sums from banks without security, the prime rate is an obvious proxy.

Second, many large companies have access to and regularly borrow through the commercial paper market. Commercial paper is short-term, unsecured promissory notes. Because the commercial paper market is more restrictive than the market for bank loans at prime, the interest rate on commercial paper is regularly 200 to 300 basis points below the prime rate. As a result, only the most creditworthy borrowers can issue commercial paper.[14]

Losey, Mass, and Li (2002) take issue with awarding prejudgment interest at the defendant's commercial paper rate. They argue that the short-term commercial paper rate does not compensate the plaintiff for the risk that the defendant will go bankrupt before the plaintiff receives the full award. This occurs because the risk of bankruptcy increases with the horizon, and most plaintiffs have been forced to make a long-term loan (perhaps many years in duration) to the defendant, whereas the holders of commercial paper typically make loans for a year or less.

Accordingly, to compensate for this risk, a court can grant prejudgment interest at the defendant's long-term (unsecured) variable interest rate, which represents the conceptually correct interest rate. Thus, if the defendant has outstanding long-term, unsecured, variable-rate debt, a court could use the rate on such debt. Many corporations, however, borrow at fixed rates and so do not have such debt outstanding. This leads to the third approach of a court estimating the defendant's long-term (unsecured) floating interest rate. This rate is typically assessed by reference to a market interest rate, such as the rate on Treasury bills or London Interbank Offered Rates (LIBOR) plus an additional amount to reflect the issuer's creditworthiness.[15]

The court can use several methods to estimate the defendant's long-term variable interest rate. Bond-rating services, such as Moody's and Standard & Poor's, rate the creditworthiness of corporations' unsecured long-term debt. Financial services firms, such as Bloomberg, publish yield curves for corporate debt with different credit ratings. They also calculate yield premiums for bonds with different credit ratings relative to Treasury securities for a range of maturities. The average premium for firms with the same credit rating as the defendant will reflect the additional interest (over Treasury securities) that such firms pay to issue debt for a given maturity. A court can then apply that average premium for long-term debt

of a given credit risk and maturity to short-term Treasury interest rates to estimate the appropriate prejudgment interest rate.

16.6 COMPUTING THE MULTIPLIER

This chapter has discussed the conceptually correct method of calculating the prejudgment interest rate, focusing on the choice of the proper interest rate index. To complete the calculation of the award multiplier using Equations (1) and (2) in Section 16.2, the length of the prejudgment period (T) must be determined and a compounding period (n) must be chosen. We now turn to these issues.

(a) The Prejudgment Period

The prejudgment period ends on the award date.[16] That leaves two open issues: when to begin the prejudgment period and whether to award interest for the entire period or to deny interest for a portion of the prejudgment period. To aid in our discussion, consider the following dates (terminology adapted from Weil, 1995): incident date, harm date, filing date, and award date.

Consider first when the prejudgment period begins. Jurisdictions fall into one of two categories: those that begin to accrue interest from the harm date (usually, but not necessarily, the incident date), and those that wait until the filing date. The recognition that prejudgment interest compensates for the defendant's possession of funds that rightfully belong to the plaintiff favors using the harm date. That will place the plaintiff in the same position as if the defendant had immediately paid the plaintiff, the intent of prejudgment interest.

Courts sometimes deny interest to plaintiffs who have unduly delayed filing under the doctrine of laches, which denies plaintiffs compensation for harm they themselves caused by waiting to file. Penalizing plaintiffs for their own delay might be appropriate if the court awards prejudgment interest at a rate that exceeds the defendant's unsecured debt rate. If, however, the court sets the rate correctly, then not commencing the accrual of interest at the harm date undercompensates the plaintiff and undercharges the defendant. Even if the plaintiff has unduly delayed action, accrual of interest at an appropriately established rate over the entire judgment period will not penalize the defendant. The defendant will break even, having held the funds during the delay period, for which it pays interest at its normal borrowing rate.

(b) Choice of Compounding Period

The last task in setting the multiplier in Equation (2) of Section 16.2 is to select the compounding period—an issue that the parties and the courts frequently overlook. All interest rates explicitly or implicitly assume a compounding period. Consider a stated annual interest rate of 12 percent. With a compounding period of one year, the effective annual rate equals 12 percent. If, however, the compounding period is the calendar quarter, implying a rate of 3 (= 12/4) percent per quarter, the effective annual rate is 12.55 ($= 1.03^4 - 1$) percent. If the compounding period is one month, implying a rate of 1 (= 12/12) percent per month, the effective annual rate is 12.68 ($= 1.01^{12} - 1$) percent.

The choice of compounding period on the award can have substantial effects. The defendant pays dollars, not percentages. For example, the *Amoco Cadiz* court awarded interest at the prime rate compounded yearly. The court did not take into account the practice that prime rate loans typically call for quarterly interest compounding. Knoll (1996) estimates that adjusting the interest rate calculation for the more frequent compounding that the quoted rate presumes would have increased the interest component of the award by about $11 million. A court should use the same compounding period in computing the award as the reference interest rate.

16.7 A NOTE ON DELAWARE LAW

Because Delaware is the legal domicile of nearly two-thirds of the Fortune 500 and more than half of U.S. publicly traded companies, Delaware's corporate law is disproportionately important.[17] In an appraisal action, the default rate that the Delaware Court of Chancery applies is the Federal Reserve discount rate, compounded quarterly, plus 5 percent (500 basis points).[18] Since the Delaware statute was amended in 2007, the Court of Chancery has never deviated from the legal (i.e., statute-imposed) rate, although it has discretion to use an alternate rate "for good cause shown."[19] Although the Delaware legal rate reflects some sound financial principles (e.g., compounding and a variable interest rate), it suffers from the same infirmities as the alternative rates discussed in Section 16.3. In addition, because this method does not tie the legal rate to the defendant's risk, one party will likely be overcompensated and the other undercompensated, and the overcompensated party will have an incentive to delay litigation. As this book goes to press, the Federal Reserve discount rate is 1.0 percent (100 basis points), which would result in a legal rate of ~~roughly~~ 6.0 percent.[20] This rate corresponds to the yield on the bonds of non-investment-grade companies. Thus, a defendant that must borrow on an unsecured basis at a rate greater than 6.0 percent will have an incentive to delay litigation. Similarly, if the defendant's unsecured borrowing rate is below 6.0 percent, then the plaintiff would have an incentive to delay.

Courts will find a legal default rate easy to calculate, and using the default rate may economize judicial resources.[21] But a court as sophisticated as the Court of Chancery should not shy away from grounding its prejudgment interest determination on sound financial principles, especially when prejudgment interest becomes a material portion of an award.

16.8 OTHER ISSUES IN THE CALCULATION OF PREJUDGMENT INTEREST

This section discusses several additional issues in the calculation of prejudgment interest: taxes, multiple defendants, the relation between prejudgment interest and currency conversion,; and injuries that produce harms at a later date.

(a) Adjusting the Multiplier for Taxes

Thus far, this chapter has ignored income taxes. To ensure that the award compensates the plaintiff without being overly generous, the court should adjust its calculation for taxes. This holds true because the tax treatment of prejudgment interest does not mirror the tax treatment of corporate bond interest.

The government taxes the interest earned on bonds as it accrues. In contrast, even accrual method plaintiffs do not pay tax on prejudgment interest until the award date. Compared with receiving compensation immediately at the time of harm and investing the proceeds in taxable bonds, the plaintiff has deferred its tax payments on its interest earnings to the award date. To adjust for the benefit of deferral, the court should compound prejudgment interest at the product of the defendant's cost of unsecured borrowing and one minus the plaintiff's tax rate over the prejudgment period[22] and then gross up that after-tax amount by dividing by one minus the plaintiff's tax rate on the award date. When the court takes into account the tax on prejudgment interest, the multiplier, denoted $m'AT$, becomes:

$$m'_{AT} = \frac{\left(1 + \frac{r_m^{AT}}{n}\right)^{nT} - 1}{1 - \tau_T} + 1,$$

where t_T = the tax rate in year T and r_m^{AT} = the mean after-tax interest rate, with $r_i^{AT} = r_i(1 - t_i)$.

The court might also need to adjust the multiplier to reflect the tax treatment of the original judgment. Equations (2) and (3) implicitly assume that the plaintiff would not have paid any taxes if the defendant had immediately compensated the plaintiff, and so the plaintiff could have invested the entire payment. If, however, the plaintiff had to pay taxes on any payment received from the defendant, then the plaintiff would have been able to invest only the after-tax amount and so would not have earned as much interest. Accordingly, when the original judgment is taxable, the multiplier, now denoted by m'_{AT} is:

$$m'_{AT} = \frac{(1 - \tau_0)\left(1 + \frac{r_m^{AT}}{n}\right)^{nT}}{1 - \tau_T},$$

where t_T and r_m^{AT} are as defined in Equation (3) and τ_0 is the tax rate at the time of injury. Multipliers calculated using Equation (3) will usually exceed those calculated using Equation (4).

Which multiplier the court should use depends on the plaintiff's tax status and the taxability of the award. (Chapter 18 discusses the tax treatment of damages.) If the plaintiff is exempt from tax, the court should use Equation (2). If the plaintiff is subject to tax on taxable interest income, the court should use either Equation (3) or Equation (4). If the award is also taxable, then Equation (4) gives the correct multiplier. On the other hand, if the award is not taxable, then Equation (3) gives the correct multiplier. In general, the award is taxable if it compensates the plaintiff for lost income, but not if it compensates for an otherwise deductible loss.[23] For example, assume a contract case in which the court awards the plaintiff damages of $1 million comprising $600,000 as compensation for expenses incurred and $400,000 for anticipated profit. The court should then assess prejudgment interest on $600,000 using Equation (3) (because that portion of the payment is in effect untaxed, assuming that the deduction was suspended

until payment) and on the remaining $400,000 using Equation (4) (because that portion of the payment is taxed).[24]

In at least two cases, *Hughes Aircraft Co. v. United States* and *Cement Division, National Gypsum Co. v. Milwaukee*, the defendants argued that the court should adjust the multiplier for the deferral of taxes. In neither case did the court adjust the multiplier for taxes. In *Cement Division*, however, the district court (to which the defendant had submitted a working paper version of Knoll, 1996) stated that the proposed adjustment would result in a more accurate calculation. Nonetheless, it declined to do so, noting that the record did not contain sufficient information about the plaintiff's income or taxes to calculate the adjustment and that no other court had previously done so.

(b) Multiple Defendants

In many cases, the plaintiff can collect its judgment, if at all, only from the defendant. In such cases, awarding prejudgment interest at the defendant's cost of unsecured debt compensates the plaintiff for the risk of default. In other cases, however, the plaintiff can collect from more than one source. When the plaintiff can recover from more than one party, the court should take that possibility into account in setting the prejudgment interest rate. In general, because the opportunity to look toward multiple sources increases the likelihood of recovery, it should reduce the prejudgment interest rate.

For example, when the court finds several defendants jointly and severally liable, a successful plaintiff will fail to collect the full judgment only if all liable defendants default. Because the plaintiff will collect the entire judgment if any defendant is solvent, the plaintiff should be awarded prejudgment interest at the market interest rate for an unsecured loan jointly made to (or guaranteed by) all the liable defendants. The interest rate for such a loan cannot exceed—and will usually be less than—the rate paid by the most creditworthy defendant.

Another example occurs when the defendant carries insurance: the successful plaintiff can then look both to the defendant and to its insurance company for recovery. When the plaintiff is covered by insurance that the defendant had in place on the injury date, the plaintiff will recover if either the defendant or its insurer is solvent. In such circumstances, prejudgment interest should not exceed—and will often be less than—the lesser of the defendant's or its insurance carrier's unsecured borrowing rate.

This issue also arises when the defendant is part of an affiliated group of companies. (Chapter [26] discusses alter ego.) Under such circumstances, a dispute can arise as to which, if any, companies within the group will have to pay the judgment if the defendant cannot. For example, a wholly owned subsidiary of Amoco operated the supertanker *Amoco Cadiz*. If the court finds the subsidiary liable but not the parent, the plaintiffs could look to only the subsidiary's assets to satisfy a judgment. Although the plaintiffs would ex ante be less likely to collect their judgment, they should receive compensation for this additional risk through a higher prejudgment interest rate based on the subsidiary's unsecured borrowing rate only, unprotected by the parent. Accordingly, the court should base the interest rate on the default risk of the subsidiary, or group of companies, whose assets the defendant can reach to satisfy its judgment.[25]

(c) Currency Conversion

Regardless of where an injury occurs and the currency of the harm's original denomination, U.S. courts usually grant the final award in U.S. dollars. Thus, when the court does not measure the original harm in U.S. dollars, setting the final judgment requires two steps: converting the award into dollars and calculating prejudgment interest.

The court can calculate the final judgment in two ways. First, it can convert the original award to dollars using the exchange rate on the harm date and then calculate prejudgment interest using the defendant's unsecured borrowing rate for dollar-denominated loans. Alternatively, a court can calculate prejudgment interest using the defendant's unsecured borrowing rate in the currency in which the harm occurred and then convert the award to dollars using the exchange rate on the judgment date.

Because exchange rates and interest rates move over time in ways that markets cannot anticipate, the order in which the court performs those two steps matters. Moreover, the wider the fluctuations, the greater the difference in results.[26] Neither sequence is wrong, but courts should not allow either party to choose the method it prefers at the end of litigation. A party would obviously choose the method that proved more advantageous. Instead, courts should develop a consistent approach.

A simple rule would require courts to follow the current jurisprudence on exchange rate conversions. The prevailing approach looks to the jurisdiction in which the plaintiff's cause of action arose to identify when to convert the award into dollars. Only when the plaintiff's cause of action arises entirely under foreign law will the courts convert the judgment on the judgment date. If, however, the plaintiff has a claim arising under U.S. law, the court will convert the judgment into U.S. dollars as of the harm date. We recommend that courts adopt such clear rules for the order of the foreign exchange conversion and prejudgment interest calculation. In the absence of such clarity, as long as the court decides early in the litigation which approach it will use, the parties will have little opportunity for strategic action.

(d) Payment for Subsequent Harms

This chapter has discussed harms that occur at a single date or over a short period around the time of the injury. Thus, for example, in *Amoco Cadiz*, the harm was the cost of cleaning up the beaches and waterways damaged by the oil spill. Barondes (2004) has shown that there is a risk of double counting when the harm occurs subsequently. In such circumstances, the appropriate response is usually to discount the subsequent harm back to the date of injury (using an interest rate appropriate for the project) and then to calculate prejudgment interest on that amount until the judgment date. That will produce a different result than just bringing the harm to the judgment date whenever the discount rate on the project differs from the prejudgment interest rate (see Weil, 2005).

Consider the following example. An oil spill occurs on January 1, 2007, and the court renders a final judgment on January 1, 2017. A portion of the judgment covers the harm from the lost fish catch in 2010 (assumed to occur on January 1, 2010, to keep the arithmetic simple). Because the court rendered its judgment on

January 1, 2017, the calculation must bring the payment to that date. The court can use one of two methods: (1) calculate prejudgment interest from 2010 to 2017, a period of seven years, or (2) discount the value of the lost catch from 2010 back to 2007, a period of three years, and then calculate prejudgment interest from 2007 to 2017, a period of 10 years.

Which approach the court should use depends on the nature of the injury. If the lost fish catch in 2010 resulted from the 2007 oil spill and was unlikely to be prevented by subsequent remedial actions, then as of 2007, the plaintiff had to look toward the defendant for a damages award to compensate for the lost catch in 2010. Accordingly, the court should discount the value of the catch back to 2007 and then calculate prejudgment interest until 2017. Alternatively, if the defendant could have remedied the harm by taking reasonable remediation steps as late as 2010, but it still failed to prevent the harm, then the plaintiff's injury can be traced to 2010. Accordingly, the court should award prejudgment interest for seven years, from January 1, 2010, to January 1, 2017.

16.9 CLOSE CORPORATIONS AND INDIVIDUAL PLAINTIFFS

If the plaintiff is an individual or small business, one must modify the analysis and conclusions discussed to this point in the chapter. The defendant's unsecured borrowing rate will not be the appropriate rate in all such cases.[27]

The argument for awarding prejudgment interest at the defendant's unsecured borrowing rate has two key premises:

1. The plaintiff had ready access to the capital markets. This premise ensured that the defendant's actions would not prevent the plaintiff from making any desirable investments and removed the argument that the court should compensate the plaintiff for a missed opportunity.
2. Investors in the plaintiff had little of their wealth tied up in the plaintiff and held diversified investment portfolios. This premise ensured that the investors would value the claim in the same manner as would the market and implied that they would require compensation for the risk associated with the claim at the amount that the market would pay if the claim were a separately traded asset.

Together, the two premises lead to the conclusion that awarding prejudgment interest at the defendant's cost of unsecured debt would compensate the plaintiff (and its investors) for the delay in receiving judgment.

When the plaintiff is a close corporation or an individual and the claim is large relative to an affected individual's wealth, then both premises will likely be violated. In such circumstances, the defendant's actions could prevent a plaintiff from making desirable investments (or increase the cost of such investments) and force the affected individuals to change their consumption. Clearly, such individuals would be unlikely to value the claim in the same way as would the market.

The actions of diversified investors set the unsecured borrowing rates of publicly traded companies in the marketplace. The market interest rate and, in particular, the excess of the promised rate over the risk-free rate will reflect the expected default loss and—to the extent that the marginal investor is risk-averse—an additional premium over the risk-free rate.

If an affected individual's portion of the claim is large relative to his or her wealth, the forced loan to the defendant would cause the individual to hold an undiversified portfolio and bear unsystematic risk, which the defendant's borrowing rate does not reflect. Thus, the use of the defendant's unsecured borrowing rate would undercompensate such an individual. In theory, to adjust this rate properly, a court would need to assess the affected individual's aversion to risk. This individual would have a great incentive to exaggerate his or her aversion to risk.[28]

In addition, the delay in receiving the judgment proceeds and interest can prevent affected individuals from exercising their optimal consumption during litigation. Although adjusting the prejudgment interest rate to reflect the affected individuals' diminished utility has theoretical merit, the mechanics of making such an adjustment are unclear because it depends on subjective information from the individual. We thus recommend that plaintiffs seeking to argue for a higher interest rate on the grounds that they would be undercompensated by the use of the defendant's cost of unsecured borrowing be prepared to show that they have a large portion of their wealth tied up in the litigation and cannot readily diversify their risk of the defendant defaulting; practitioners representing the defendant should be ready to rebut these arguments.

16.10 CONCLUSION

This chapter has set forth the appropriate method for assessing prejudgment interest in litigation and has demonstrated how to apply the rate in different situations. We argue that in lawsuits between two parties with ready access to the capital markets courts should calculate prejudgment interest using the defendant's unsecured, short-term borrowing rate with possible adjustment for the risk that the defendant will default. If done well, such an award will compensate the successful plaintiff for the delay in receiving payment and for the risk that the defendant will go bankrupt before the plaintiff can collect. It will also prevent the defendant's unjust enrichment without further penalizing the defendant. Moreover, by calculating prejudgment interest at a floating rate over the prejudgment period instead of at a fixed, long-term interest rate at the start of the period, the court can eliminate the risk of interest rate changes.

Use of the defendant's unsecured, floating borrowing rate has many benefits. Once litigation has begun, this rate will economize judicial resources because neither party has an incentive to delay litigation unnecessarily. This rate will give both parties the proper economic incentives to engage in appropriate behavior prior to litigation because defendants who are found liable must pay, and successful plaintiffs will receive complete economic compensation for damages.

NOTES

1. Since postjudgment interest is statutory in most jurisdictions, there is little flexibility and therefore little value to be added by experts.
2. Even in those states in which prejudgment interest is fixed by statute, attorneys and litigation experts can still add some value. For example, if the statutory rate differs from the theoretically correct rate, the parties will have incentives to alter their litigation and negotiation strategies.

3. Postjudgment interest is granted from the date of judgment until the date of payment. Under federal law, postjudgment interest is awarded at the 52-week Treasury bill rate. 28 U.S.C. 1961(a).
4. The dispute arose out of a violation of the Arkansas River Compact. The compact, negotiated by Kansas and Colorado, and approved by Congress in 1949, provided that future development of the river basin could not materially deplete the quantity of usable water available to downstream users.
5. Equation (16.2) assumes that prejudgment interest will be compounded. Although interest in commercial settings is always compounded, some courts, following the traditional common law rule for prejudgment interest, award simple interest. Courts should, however, award compound prejudgment interest.
6. To restate the solution as an equation: If the harm is H and the plaintiff's probability of losing at trial is p, then to compensate for the risk of judicial error, the court should award a judgment, not of H, but of $H/(1 - p)$.
7. John C. Keir and Robin C. Keir, "Opportunity Cost: A Measure of Prejudgment Interest," *Business Lawyer* (1983): 129–52. They argue that if a firm's historical return exceeds its weighted average cost of capital, the court should award prejudgment interest at the higher rate; otherwise, the court should award prejudgment interest at the plaintiff's cost of capital.
8. Publicly traded firms rarely issue new equity, so the hypothetical in the text assumes that the plaintiff issues debt to raise additional capital. The logic, however, is the same if the plaintiff issues equity except that the return on equity replaces that on debt.
9. The language in the text assumes that the plaintiff is certain to succeed on the merits and be granted a judgment (before calculation of prejudgment interest) of a known amount. As Section 16.3 discusses, prejudgment interest does not compensate successful plaintiffs for their litigation costs or the possibility that they might have lost the case.
10. This conclusion is consistent with the financial economist's view that the payoff to a long party of a forward contract (the party purchasing the asset, who, in the litigation setting, is the defendant) is economically identical to a fully levered position in the underlying asset. Because the leverage is the obligation of the long party (defendant), only the long party's (defendant's) default risk is relevant.
11. Obviously, the court should not allow either party to select one of the methods at the end of litigation. That would give the party with the choice a valuable option that would encourage it to delay. The method should be set beforehand. The actual rates, however, can be determined at the end of litigation.
12. Chapter 5 discusses *ex ante* and *ex post* calculations.
13. That is not to say that there is no cost to the plaintiff from tying up the money, or, more accurately, that the market does not pay a premium for tying up capital. However, such a premium, if it exists, is not given by the yield curve premium.
14. Another option would be to use the rate on debt issued by similarly risky companies as determined by S&P or Moody's. In a 2007 distribution plan arising from market timing trades by certain mutual fund investors, the SEC specifically referenced the authors' work and used the Merrill Lynch index of 1–3 year A-rated corporate debt over the period in which the timer trading occurred to approximate the cost of unsecured, short-term borrowing of certain Bank of America entities. Banc of Am. Capital Mgmt., LLC, Exchange Act Release No. 34-56077, 2007 WL 2031557 (July 16, 2007). The plan of distribution does not explain why the SEC did not use Bank of America's actual short-term borrowing rate and how often, if ever, the rate was adjusted, the compounding period, or other details.
15. If a defendant has outstanding long-term variable interest rate debt, the court can use the rate on the debt, provided that it adjusts for the value of any put and call provisions held by the holder or issuer.
16. Frequently, because of appeals, collateral litigation, and the possible delays in collection, the plaintiff is not paid until later. The period from judgment to payment is the postjudgment period.

17. Christopher Wink, *64% of Fortune 500 Firms Are Delaware Incorporations: Here's Why* (Sept. 23, 2014), http:\\technical.ly/Delaware/2014/09/23/why-delaware-incorporation/.
18. DEL CODE ANN. tit. 8, § 262(h). This statute was revised in 2007 to harmonize the statutory legal rate applicable to appraisal proceedings with the rate applicable to Delaware civil actions in general under Delaware Code Title 6, Section 2301. The 2007 revisions also specifically provided for the award of compound interest. The discount rate is the rate charged to commercial banks on 100 percent secured loans from the Federal Reserve. There are two rates, the primary credit rate and secondary credit, which is the rate applicable to borrowers not eligible for the primary credit program. It is not clear which rate should be used.
19. DEL CODE ANN. tit. 8, § 262(h). In dicta, the Court of Chancery has suggested that deviations from the legal rate could be appropriate in the case of improper delay or a bad faith assertion of valuation claims. *In re Appraisal of Metromedia International Group, Inc.*, 971 A.2d 893, 907 (2009).
20. The Federal Reserve discount rate is an annualized overnight rate and would have to be adjusted to reflect quarterly compounding.
21. In response to criticisms that the Delaware rate may be overcompensatory in the current, low-interest environment and may encourage investments in appraisal actions, Delaware amended in 2016 its appraisal statute to permit a defendant to pay cash to plaintiff prior to the payment of the final appraisal value. If such a payment is made, statutory interest will accrue only on the difference between the cash paid and the fair value of the shares determined by the Court. DEL CODE ANN. tit. 8, § 262(h) (effective Aug. 1, 2016). Some academic commentators have challenged the claim that Delaware's statutory rate encourages litigation arbitrage. See Charles R. Korsmo and Minor Myers, *Appraisal Arbitrage and the Future of Public Company M&A,* 92 Wash. Univ. L. R. 1551, 1580-81 (2015) ("The idea that sophisticated investors are pouring hundreds of millions of dollars into risky appraisal proceedings to chase above-market interest rates simply is not credible.").
22. Implicit taxes (in the form of lower expected rates of return) on some investments, such as municipal bonds, are taxes for this purpose.
23. In the latter circumstance, no deduction is generally allowed while the case is in litigation.
24. Equations (16.3) and (16.4) both include the plaintiff's tax rate. That rate should be the plaintiff's marginal tax rate on the amount at issue. That rate will often differ from the effective tax rate that is reported in the plaintiff's financial reports (Scholes et al., 2005). The appropriate rate is also affected by the tax planning strategies available to the plaintiff (Weil, 2004).
25. Parent–subsidiary liability has the potential to create a strategic issue because a defendant whose subsidiary is sufficiently solvent to pay the judgment has an incentive to concede the parent's responsibility, assuming the subsidiary is liable at the end of the process, in an attempt to keep the prejudgment interest rate down.
26. The possibility of arbitrage will ensure that the two techniques will yield the same final judgment using long-term interest rates over the entire prejudgment period in both markets and the forward foreign currency–dollar exchange rate as of the date of harm. That equivalence, however, does not hold for shorter-term interest rates and spot exchange rates, which is what courts would use if they adopted our method.
27. If the plaintiff is a publicly traded corporation and the defendant an individual or small business, then a court should still award prejudgment interest using the defendant's unsecured borrowing rate. The plaintiff has made a forced loan to the defendant and must be compensated for the risk that the defendant won't pay any final judgment. Unlike the case of corporate defendants, there is no readily available interest rate a court could look to in order to set the appropriate prejudgment interest rate. Home mortgage and car loan rates are not appropriate benchmarks because such loans are secured. The rate on credit card debt is probably better because it is unsecured. Credit

card rates, however, vary greatly and are relatively high. If this benchmark is used, the defendant would greatly benefit by being able to show that he or she would be eligible for a rate on the low end of the range. As explained previously, to the extent that a judgment was covered by insurance, the insurance company's unsecured borrowing rate would be the appropriate rate.

28. If plaintiffs hold employee stock options, we can infer something about the aversion to risk of nondiversification from their voluntary exercise of options and disposal of resulting shares.

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