# Discount Rates for Determining the Present Value of Different Types of Pecuniary Damages - 2016

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## Abstract

Experts providing economic damages for litigation usually must provide future damage amounts or future cash flows in the form of present value. To make such a calculation, the expert must not only be aware of the mathematics in applying the appropriate formulas but the methods generally accepted by the courts. That expert should also be aware of other methods which could have been used and criticisms regarding those methods. This article provides a discussion of commonly used techniques and alternative methods for calculating present value in forensic situations. Although not comprehensive, it highlights areas of consensus and disagreement in the forensic economic community. Realizing that in most cases the expert decides on the discounting method to be used, this article provides information and resource data to assist experts in making such decisions.

## Introduction

When economic experts testify about economic damages, they are usually expected to provide conclusions that have reduced any future losses or costs to recover to present value. Even in jurisdictions where experts are instructed to assume total offset, the process of discounting future amounts to present value is maintained. This is because the total offset results are based on the assumption that the growth rate and discount rate are equal and therefore offset one another, a somewhat dour assumption.

This article will review the commonly used methods for discounting to present value for two specific damages areas:
1) Personal Damages
2) Commercial Damages

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While the theory used for discounting is the same for both categories of damages, each has a different view of assessing and determining the rate to be used for discounting. Each damages category deserves an analysis of the commonly used methods relating to those types of damages.


## Present Value

In litigation, the trier of fact assists in the determination of the amount it would take to make the plaintiff economically whole, presuming that the defendant caused the injury. Any future losses or expenses would need to be shown in their present value to prevent the defendant from paying more than required. For this article, present value is defined as the current value (e.g., as of "today") of a future sum of money or a series of future cash flows given a specific rate of return or discount rate.

The greater the discount rate applied to these future cash flows the lesser the present value. For example, is a promise to pay a dollar next year worth 98 cents or 95 cents in today's money? A lower 95 cents amount means that a higher discount rate has been applied. Therefore, it is not unusual in many cases to see the plaintiff arguing for a lesser discount rate and the defendant a greater one. That is why an expert may provide valuable information to the court on the appropriate discount rate and the resulting present value amount.

Technically, the formula for examining net present value for a permanent loss of next cash flow is seen in the following formula of years 1 through 4, with a perpetual amount:

$$Value = \frac{NCF_1}{(1+k)^1} + \frac{NCF_2}{(1+k)^2} + \frac{NCF_3}{(1+k)^3} + \frac{NCF_4}{(1+k)^4} + \ldots + \frac{NCF_\infty}{(1+k)^\infty}$$

*Where* $NCF_n$ = Net cash flow (benefit stream) in time period "n"
$k$ = Discount rate appropriate for the anticipated economic benefit

Without getting too deep in the math, economic experts should know that a "mid-year" convention could be used. This is done by substituting half years in the exponents, such as in year one, instead of the $(1+k)^1$ you would have $(1+k)^{0.5}$ and in the second period $(1+k)^2$ would be $(1+k)^{1.5}$ and so forth. This financial adjustment has the effect of seeing the cash flows occur ratably in each year, or received in equal amounts each monthly period. This "mid-year" convention actually increases slightly the net present value conclusion.

U.S. Supreme Court decisions have provided specific guidance in determining discount rates for personal damages matters. Many states have adopted the Supreme Court's guidance in assessing the appropriate methods to use for personal damages cases. The same is not true in the area of commercial damages. The U.S. Supreme Court has not provided a precedent setting opinion relating to commercial damages. Federal and state

courts provide greater flexibility for experts in assessing commercial damages. This, of course, has led to numerous differences of opinion among experts working in this area.

## Personal Damages

In personal damages cases, an expert provides present value calculations for many categories including, but not limited to, lost earning capacity, lost expected earnings, lost economic support, and pension and/or retirement income. Calculations may also determine the present value of future medical and life care. In federal and most state cases, a relatively risk free rate (e.g., U.S. Treasuries or AAA municipal bonds) is typically used for discounting these future sums to present value.

The use of a risk free rate may be traced to the U.S. Supreme Court's *Chesapeake & O.R. Co. v Kelly* decision in 1916.

> "So far as a verdict is based upon deprivation of future benefits, it will afford more than compensation if it be made up by aggregating the benefits without taking account of the earning power of the money that is presently to be awarded. It is self-evident that a given sum of money in hand is worth more than the like sum of money payable in the future. We do not mean to say that the discount should be at what is commonly called the 'legal rate' of interest; that is, the rate limited by law, beyond which interest is prohibited. It may be that such rates are not obtainable upon investments on safe securities, at least, without exercise of financial experience and skill in the administration of the fund; and it is evident that the compensation should be awarded upon a basis that does not call upon the beneficiaries to exercise such skill, for where this is necessarily employed, the interest return is in part earned by the investor rather than the investment. This, however, is a matter that ordinarily may be adjusted by scaling the rate of interest to be adopted in computing [cite omitted] the present value of the future benefits; it is a matter of common knowledge that, as a rule, the best and safest investments, and those which require the least care, yield only a moderate return." (*Chesapeake & O.R. Co. v Kelly*, 241 U.S. 485 (1916))

In its *Jones & Laughlin Steel Corp. v Pfeifer* decision, the Supreme Court reaffirmed its position and applied the "best and safest" rate which it calls a "risk free rate."

> "The discount rate should be based on the rate of interest that would be earned on 'the best and safest investments.' [cite omitted] Once it is assumed that the injured worker would have definitely worked for a specific term of years, he is entitled to a risk-free stream of future income to replace his lost wages; therefore, the discount rate should not reflect the market's premium for investors who are willing to accept some risk of default." (*Jones & Laughlin Steel Corp. v Pfeifer*, 462 U.S. 523 (1983))

In the Pfeifer decision, the Court noted three methods for determining damages awards based on inflation (case by case, below market discount rate, total offset). The Court went on to say, "As Judge Newman has warned: The average accident trial should not be

converted into a graduate seminar on economic forecasting. Doca Marina Mercante Nicaraguense, S.A., 634 F.2d, at 39." (*Pfeifer*)

The Fifth Circuit Court of Appeals outlined these three methods discussed in *Pfeifer* in its *Culver v Slater Boat Co.* decision.

> "As the Court noted in *Pfeifer,* three methods are available for adjusting damage awards for the effect of inflation. In the case-by-case method, the fact-finder is asked to predict all of the wage increases a plaintiff would have received during each year that he could have been expected to work, but for his injury, including those attributable to price inflation. This prediction allows the fact-finder to compute the income stream the plaintiff has lost because of his disability. The fact-finder then discounts the income stream to present value, using the estimated after-tax market interest rate, and the resulting figure is awarded to the plaintiff. In the below-market-discount-method, the fact-finder does not attempt to predict the wage increases the particular plaintiff would have received as a result of price inflation. Instead, the trier of fact estimates the wage increases the plaintiff would have received each year as a result of all factors other than inflation. The resulting income stream is discounted by the below-market discount rate. This discount rate represents the estimated market interest rate, adjusted for the effect of any income tax, and then offset by the estimated rate of general future price inflation. The third method is the 'total-offset' method. In this calculation, future wage increases, including the effects of future inflation, are legally presumed to offset exactly the interest a plaintiff would earn by investing the lump-sum damage award. Therefore, the fact-finder using this method awards the plaintiff the amount it estimates he would have earned and neither discounts the award nor adjusts it for inflation." (*Culver v Slater Boat Co.* 722 F.2d 114 (1983))

Given federal and state court rulings that plaintiffs should be protected against risk, and explicitly against default risk in the already cited Pfeifer decision ("the discount rate should not reflect the market's premium for investors who are willing to accept some risk of default"), the question remains whether plaintiff should be protected <u>only</u> against default risk or <u>also</u> against inflation risk.   This is a main argument of damages experts (DE) who use TIPS or T-bills as the investment instrument.

One argument in favor of allowing at least for some inflation risk is the "parity of risk" concept: a certainty-equivalent (or risk-free) yield should not be used to discount an uncertain cash flow stream.  Exclusion of all risk thus creates a bias favoring plaintiffs (Margulis, 1992). Other analysts (e.g., Brush, 2003) have noted that award bias results from the exclusion of inflation risk, such as by discounting lost earnings at short term T-bill rates: "If use of a risk-adjusted discount rate is considered appropriate, then discounting with Treasury bills will result in overcompensation of the plaintiff."

A related question involves not only whether any type of risk should apply in discounting a damage award, but whether risk should more properly be included in the numerator (i.e., possibly a range of future cash flows, or rendering a certainty equivalent measure of earnings (Bell and Taub, 1977), and/or in the denominator via a low risk or

risk free discount rate. On the many issues involving risk in discounting, forensic economists continue to disagree and apply a wide variety of methods. A thorough discussion of this concept can be found in William Brandt's 2014 article "Discounting Future Losses to Present Value: Consideration of Inflation and Market Risk."

While these decisions have provided a framework for discounting future damages to present value, differing opinions continue on the data to use and their application. One of these issues is the use of current or historical interest rates in determining the discount rate. In the most recent survey of members of the National Association of Forensic Economics (NAFE) addressing the choice between current and historical rates, what had long been a wide disparity favoring historical rates has gradually been eliminated, with the two main methods of discounting awards now approaching parity in usage (Luthy, Brookshire, Rosenbaum, Schap, and Slesnick, 2015).

Exhibit A shows arguments pro and con for each side, and the latest usage preferences at the bottom:

### Exhibit A

|  | Current Market Yields (Single bond or bond "ladder" with current yields at all maturities) | Historical Average Yields (single yield based on some average lookback period) |
|---|---|---|
| Pros | • <u>Objective</u><br>• <u>Observable</u> every day<br>• <u>Investible</u> in real bonds & yields<br>• Can approximately <u>cash flow match</u> each year's lost future earnings by a ladder of bonds with same maturities. (Exact match with zero coupon bonds) | • <u>More Stable</u> over time (<u>if</u> one uses the same bond maturity and lookback period for discounting each time)<br>• Little reason to update results near time of trial |
| Cons | • Damage award results are <u>more volatile</u> and dependent upon when observed<br>• Material changes in valuation before trial <u>may warrant revision</u> to damage award. However, easy to update results if needed. | • Damage awards results are <u>inherently subjective</u>, with many choices of bond maturities & lookback periods for discounting<br>• Plaintiff <u>cannot invest in a "historical average yield"</u>; there is no way to link the discount rate with an available investment rate |
| % FEs 2015* | 38.1% | 39.8% |

*Percentages are based on responses to the 2015 survey sent to the members of NAFE. (Luthy, et al, 2015, p. 67)

A separate issue in determining the appropriate discount rate is whether to use short term maturities, long term maturities, or a combination of both. Even the U.S. Supreme Court noted the dilemma in the *Pfeifer* decision.

> "On the one hand, it might be assumed that…the worker will invest in a mixture of safe short-term, medium-term, and long-term bonds, with one scheduled to mature each year of his expected worklife. On the other hand, it might be assumed that the worker will invest exclusively in safe short-term notes, reinvesting them at the new market rate whenever they mature." (*Pfeifer*)

As can be seen by the responses to the 2015 Survey of NAFE members, experts have not reached conclusions on this matter. When asked, "…what is the maturity of securities that you would emphasize in selecting an interest rate(s)?" The responses showed a lack of consensus with wide variability. (Luthy, et al, 2015, p. 62)
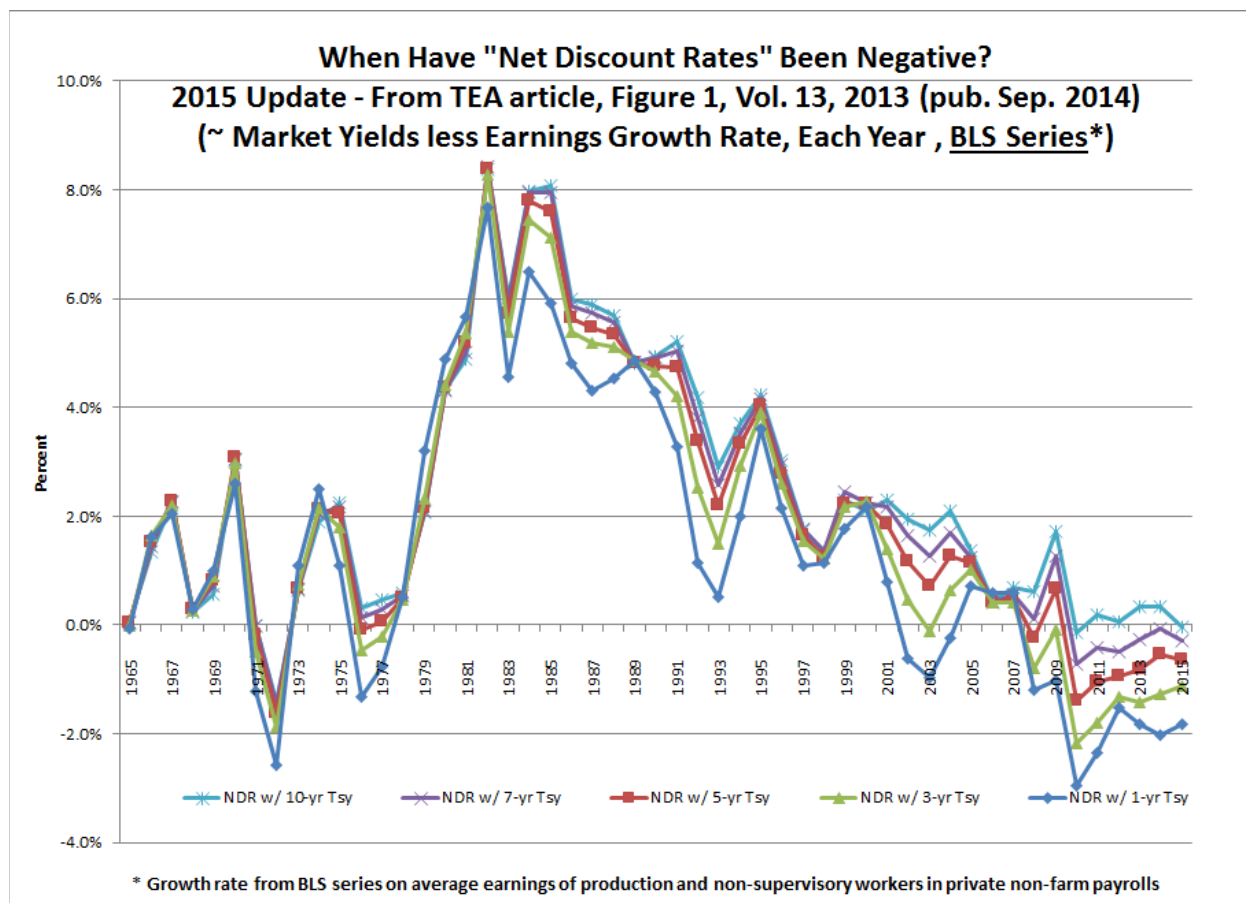
- ◦ Short-term:           9.2%
- ◦ Intermediate-term:    14.7%
- ◦ Long-term:            29.4%
- ◦ Mixed:                34.2%
- ◦ Other:                12.5%

A more recent issue relates to the historically low yields found in the Treasury securities market since 2008. For experts using the *net discount rate method*, this has provided the possibility of a negative discount rate in total. To determine the net discount rate, the earnings growth rate is "netted" from the interest rate providing a single (net) rate that is applied to the future losses. When the interest rate is less than the growth rate, the resulting net discount rate is a negative number. A negative discount rate means the resulting present value is greater than the future value. This is because the interest being received does not offset the growth being assumed for the risk free cash flow stream. Therefore, more money is needed in the present to keep up with the anticipated growth.

This issue has caused much discussion among forensic experts. But, as Exhibit B shows, this is not the first time since 1965 the U.S. economy has seen negative rates:

**Exhibit B**



Since the Great Recession in 2008 through 2010, the Federal Reserve has maintained a low interest rate period in an attempt to stimulate the economy and decrease unemployment. When it moves away from this policy, at least short-term bond yields should increase. This should result in positive net discount rates and remove the concern over negative discount rates for those experts using a net discount rate approach. However, some economists view the period of very low interest rates will continue well into the future.

**Commercial Damages**

Commercial damages generally fall into three categories; (1) lost profits with a recovery period, (2) lost profits with a permanent loss of earnings but with continuity of the business, and (3) business destruction. Lost profits are the projected net profits lost by the injured business relative to a particular situation. Unlike personal injury cases where a person's worklife expectancy or years to retirement maybe used to determine the future losses, the loss period for lost profits will be shorter, perhaps only a few years or the length of a specific contract.

Graphically, these three types of losses can be understood as follows:
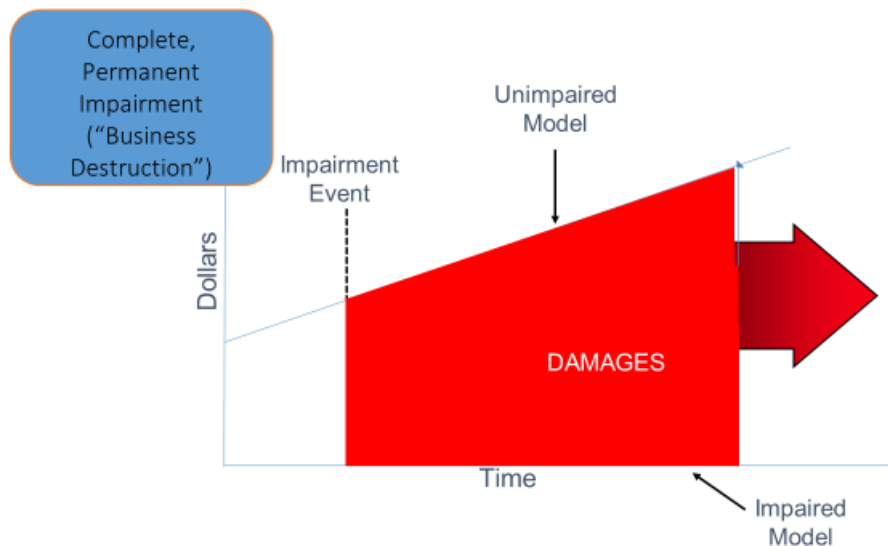
## Lost Profits with a Recovery Period
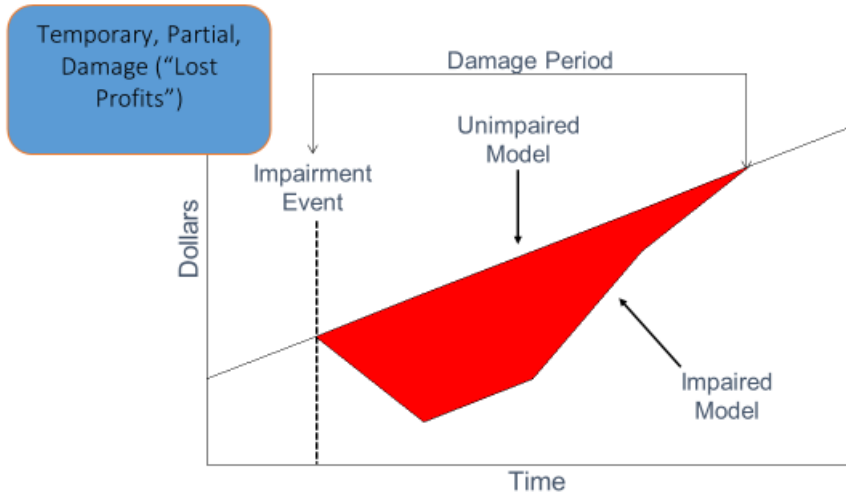


## Lost Profits with Permanent Impairment
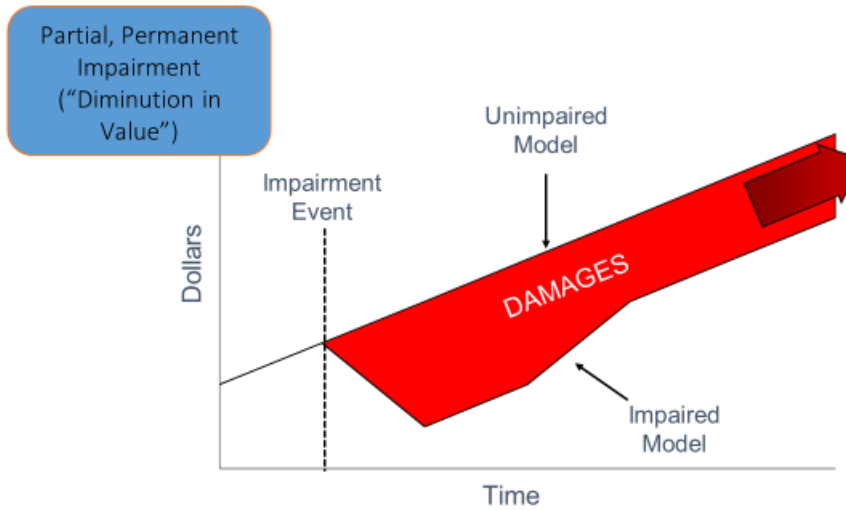
**Business Destruction**

Future lost profits must be discounted to present value. Unlike personal damages models, most lost profit discount rates include not only a risk free rate but added risk premiums that are based on the uncertainty of the lost income stream. Over the years, federal and state courts have accepted lost profit discounts rates from the risk free rate to rates equal to the plaintiff's cost of capital.

If a business was destroyed by the alleged injury, the proper measure of damages is a business valuation. This calculation will capture the present value of all of the projected future business' net profits. In most circumstances, this period runs longer than most worklife expectancy or years to retirement periods. A capitalization rate (or, discount rate less long-term growth) is applied to this one time future income stream to provide the business valuation. Most states require the fair market value method be used to show the business value.

Exhibit C provides a comparison of duties between estimating lost profits and the valuation of a destroyed business.

**Exhibit C**

| Attribute | Commercial Damages or Lost Profits | Business Valuation |
|---|---|---|
| Income stream | Incremental stream of avoided costs, typically before income tax | Typically after tax net cash flow to equity into perpetuity |
| Standard of value | "Fair Value" as may be defined by the Court | "Fair Market Value" as defined by the IRS |
| Valuation methods | PV of post-trial loss added to pre-trial loss including pre-judgment interest at date of trial | Discounted net cash flow model (single or multiple period) supported by other methodologies |
| Discount rate | Risk assessment, or risk-free, or plaintiff's use of funds | Typically Weighted Average Cost of Capital (WACC) based on risk assessment |
| Use of hindsight | Considered (typically) | Generally limited to "Known, knowable or reasonably foreseeable" at date of value |

For lost profits, a commonly used method for determine the appropriate discount rate is the build-up method. Through the build-up method, an expert will begin with a risk free rate and add various risk factors based on the facts of that case. The sum of these various rates is the ultimate discount rate. Exhibit D shows an example of the build-up method for the "cost" of equity, or "k" as of August 12, 2016 for a particular firm.

## Exhibit D

| Cost of Equity: Ke = Rf + RPm + RPs + RPi + RPu | | Notes |
|---|---|---|
| Risk-Free Rate (Rf) | 1.85% | (1) |
| Market Premium (RPm) | 6.03% | (2) |
| Small Company Market Premium (RPs) | 4.04% | (3) |
| Industry Specific Risk Premium (RPi) | 3.50% | (4) |
| Company Specific Risk Premium (Rpu) | 6.00% | (5) |
| ke = | **21.42%** | |

**Footnotes:**

(1) 20-Year Treasury Bond August 12, 2016, Federal Reserve Release H.15.

(2) Duff & Phelps Valuation Edition 2016 Yearbook supply side equity risk premium effective December 31, 2015.

(3) Based on Duff & Phelps Valuation Edition 2016 Yearbook (Realized Return in Excess of Risk-free Rate for Decile Portfolios of the NYSE less Long-Horizon Expected Equity Risk Premium) 10(a) Decile calculation.

(4) Based on Duff & Phelps Valuation Edition 2016 Yearbook, Industry Premia Estimates, xxxxxxx.

(5) Based on discussions with management and appraisers' analysis of competitive environment, risks of financial performance and competition also considered.

A number of risk factors may be considered when applying the build-up method. Exhibit E contains a list of these factors. While not all inclusive, it provides an insight into the base rates and risk factors to consider in assessing the discount rates for lost profits.

**Exhibit E**

<u>Unsystematic/ subjective risk</u>

- Market Risk
    - Barriers to market entry
    - Market size or share constraints
    - Strength of competition
    - Buyer product or service acceptance
    - Shifting buyer preferences
- Financial risk
    - Illiquidity
    - Unfavorable contractual obligations
    - Excessive debt
- Management risk
    - Depth of management talent
    - Key employee dependence
    - Management's past experience with product or service
- Product risk
    - Key supplier dependence
    - Obsolescence
    - Reliance on specific patents and
    - licenses
    - Lack of productive capacity
    - Commercial impracticality of production
- Company sales risk
    - Key customer dependence
    - Risk
    - Lack of product diversification
    - Lack of geographic sales diversification
- Business environment risk
    - General economic conditions
    - Government regulation

<u>"Base" rate</u>

- Systematic risk
    - General equity risk premium
    - Beta coefficient for the subject industry to modify the general equity risk premium
    - Company size premium
- Risk-free
    - U.S. Treasury coupon bond, note

## Bankruptcy

Bankruptcy courts have addressed the use of present value and its application to the language of the Bankruptcy Code. This issue was discussed in "Commercial Real Estate, Chapter 11 Bankruptcy, & Cram Down Interest Rates." (Needham and Schroeder, 2013, p. 1-12) This section provides a brief highlight of that more lengthy discussion.

For bankruptcy courts, the term present value takes on a slightly different definition from personal and commercial damage calculations. "The Chapter 11 cram down provision has been interpreted to require that the total deferred payments have a present value equal to the amount of the secured claim. (*In re: T-H New Orleans, LP,* 800)

The U.S. Supreme Court's *Till* decision provided guidance for determining the appropriate interest rate to be used in Chapter 13 (personal bankruptcy) matters. It called for the use of the formula approach and the addition of 1% to 3% to the existing prime lending rate for determining the interest rate. When approved by the court, this formula based interest will provide for the present value of the secure claim being repaid over time. (*Till v SCS Credit Corp.*, 541 U.S. 465)

Since *Till*, many bankruptcy courts have chosen to apply a formula approach for determining a cram down interest rate in Chapter 11 cases. "While many courts have chosen to apply the *Till* plurality's formula method under Chapter 11, they have done so because they were *persuaded* by the plurality's reasoning, not because they considered *Till* binding." (*In re: Texas Grand Prairie Hotel Realty, LLC,* 14)

The *Till* decision also provided the following guidance: A bankruptcy court should "select a rate high enough to compensate the creditor for its risk but not high enough as to doom the plan. If the court determines that the likelihood of default is so high as to necessitate an 'eye-popping' [cite omitted] interest rate, the plan probably should not be confirmed." (*Till*, 480-481)

A review of methods accepted by courts used in determining the appropriate cram down interest rate in Chapter 11 matters shows great differences in the "time value of money." As noted by the Fifth Circuit Court of Appeals, "Today, we reaffirm our decision in *T-H New Orleans*. We will not tie bankruptcy courts to a specific methodology as they assess the appropriate Chapter 11 cram down rate of interest; rather, we continue to review a bankruptcy court's entire cram down rate analysis only for clear error." (*In re: Texas Grand Prairie Hotel Realty, LLC,* 15)

## Conclusion

All fields of work have terms of art as well as science. Forensic economic work is no different. Experts working in this area should know the meaning of such terms and apply them daily to their work product. Economic experts providing calculations in litigious matters must provide future amounts or future cash flows in the form of

present value. To make such a calculation, the expert must not only be aware of the mathematics in applying the appropriate formulas but the methods generally accepted by the courts. In addition, the expert should be aware of other methods and the criticism concerning those methods. This article has provided a discussion of commonly used techniques and alternative methods or factors applied in forensic situations. Although not comprehensive, this article highlights areas where there is consensus in the forensic community and where there is not. Realizing that the ultimate decision on the method to use is up to the expert, information and resource data has been provided to assist any expert in making such a decision.

This article has also noted differences that can arise while working in different areas of forensic work. When working with pecuniary damages calculations (whether personal or commercial damages), the term present value refers to the current value of a future sum of money or a series of future cash flows given a specific rate of return or discount rate. In working in bankruptcy matters, the term present value refers to the interest rate needed to compensate a creditor for a claim being paid over time instead of at or near the effective date of the reorganization plan. To fulfill the law, the debtor must make payments that are at least equal to the value of the claim on the effective date. The interest rate then provides additional funds to the creditor for the risk free rate and any risks associated with this payment stream. Being aware of these issues allows retained experts to apply their knowledge and training in the appropriate way. This article has provided an overview to assist the reader in understanding such issues.

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