TAXATION CONSIDERATIONS IN ECONOMIC DAMAGES CALCULATIONS

By Jonathan S. Shefftz

Abstract

Present value cash flow calculations for economic damages should be performed on an after-tax basis, regardless of whether the damages award will be subject to taxation. Pre-tax calculations can arrive at incorrect results, particularly where accounting income and cash flow do not match. If the damages award will be subject to taxation, then the analytically correct approach is to take the result of the after-tax damages calculation and simply "gross-up" for expected taxes, rather than perform the present value calculations on a pre-tax basis.

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Introduction

As the relevant literature discusses quite extensively,[1] economic damages in commercial litigation or personal injury cases are typically determined as the difference between two scenarios: a non-breach/non-injury (or hypothetical "but-for") scenario and a breach/injury (or "actual") scenario. Elements that are common to the two scenarios can be ignored -- as they simply net out in any comparison -- but the analysis must incorporate all elements that are different. Then the analysis must identify the cash flows associated with the two scenarios' various elements.

Finally, if the cash flows occur over an extended period of time, they must be adjusted for the time value of money. Future cash flows are adjusted back in time using a discount rate to produce their equivalent present value as of some common date.[2] Discounting thereby allows

[1] See, for example: John D. Taurman and Jeffrey C. Bodington, "Measuring Damage to a Firm's Profitability: Ex Ante or Ex Poste?", *The Antitrust Bulletin* (Spring 1992); James Plummer and Gerald McGowin, "Key Issues in Measuring Lost Profits," *Journal of Forensic Economics* (6(3) 1993); Vincent E. O'Brien and Joan K. Meyer, "A Guide to Calculating Lost Profits," *The National Law Journal*, (January 29, 1990); William B. Tye, Stephen H. Kalos, and A. Lawrence Kolbe, "How to Value a Lost Opportunity: Defining and Measuring Damages from Market Foreclosure," *Research in Law and Economics* (Volume 17); Franklin M. Fisher and R. Craig Romaine, "Janis Joplin's Yearbook and the Theory of Damages," *Journal of Accounting, Auditing and Finance* (Winter 1990); R.F. Lanzillotti and A.K. Esquibel, "Measuring Damages in Commercial Litigation: Present Value of Lost Opportunities" *Journal of Accounting, Auditing and Finance* (Winter 1990); James M. Patell, Roman L. Weil, and R. Craig Romaine, "Accumulating Damages in Litigation: The Roles of Uncertainty and Interest Rates," *Journal of Legal Studies* (June 1982).

[2] Typically the calculation is performed as the difference of the two scenarios' present values, rather than the present value of the two scenarios' differences in each year. Arithmetically, the latter approach will produce the same result as the former if the same discount rate is applied to both scenarios for all cash flows. But if the two scenarios entail cash flows of a significantly different nature and riskiness, then this could merit using a different discount rate, as the discount rate determination is generally tied to the cash flows' risk. For example, the breach

dollars from different years – which can be thought of as different "currencies" -- to be expressed in a common measure so that they can sensibly aggregated and/or compared. Properly performed, the damaged party would be indifferent between the lump sum present value as of this common date and a specified stream of payments extending into the future.

Concerning the choice of this common date (i.e., to which the cash flows will be discounted), an important complication arises, especially when a considerable lag exists between the time of the breach/injury and the time of trial/award. One approach is to first discount all cash flows back to the initial breach/injury date, then compound them forward -- often at a rate that is specified by the applicable legal statute -- to the trial/award date. Another approach is to discount all future cash flows -- with "future" defined from the perspective of the time of trial/award -- back to the trial/award and separately compound all past cash flows forward to the trial/award date. Depending on the different rates specified for discounting and compounding, and depending on the types of cash flows involved, this at first seemingly mere mechanical difference can have a drastic impact upon the results. [3]

Yet another distinction is that the first approach described above is often -- though not always -- conducted from an *ex ante* perspective (i.e., drawing on only the information that was known at the time of the breach/injury) whereas the latter approach is conducted from an *ex post* perspective (i.e., utilizing all available information known to the analyst). Sometimes different discount and compound rates are used for different parts of the calculation, corresponding to which cash flows are "known" and "unknown" as of certain dates.[4]

Many aspects of the summary contained in the preceding four paragraphs are expounded upon in great detail in the relevant literature. However, a surprising paucity of research focuses on the adjustment of the cash flows to an after-tax basis.[5] This article's goal is to demonstrate the importance of this adjustment, regardless of whether the damages award will be subject to

scenario could entail not only a lower magnitude of cash flows but also a greater uncertainty, and hence these cash flows should be discounted back in time at a higher rate that would be appropriate for the non-breach scenario. In such a case the present values of the two scenarios should be computed separately and then their difference should be taken, as opposed to computing the present value of the difference between the two scenarios' cash flow in each year. Situations that would merit such an approach, however, are likely to be rare.

[3] For a more detailed discussion of this issue, see: Franklin M. Fisher and R. Craig Romaine, "Janis Joplin's Yearbook and the Theory of Damages," *Journal of Accounting, Auditing and Finance* (Winter 1990); R.F. Lanzillotti and A.K. Esquibel, "Measuring Damages in Commercial Litigation: Present Value of Lost Opportunities" *Journal of Accounting, Auditing and Finance* (Winter 1990).

[4] Without commenting at length on this distinction, the division between deeming historical cash flows as "known" and future cash flows as "unknown" is somewhat artificial. For example, even if -- with the aid of hindsight -- historical input prices, output prices, interest rates, etc., are all known, the but-for cash flows that would have resulted in the past are still not known with certainty, since a myriad of other factors may have conspired to affect the cash flows in a manner that is beyond the scope of the analysis.

[5] For example, in Patrick A. Gaughan, *Measuring Commercial Damages* (2000), only two pages in a 403-page book discuss taxation considerations, and in the Roman L. Weil, Michael J. Wagner, and Peter B. Frank (eds.), *Litigation Services Handbook: The Role of the Accountant as Expert* (1995), only two pages in one article out of 12 articles on commercial damages discuss taxation considerations.

taxation. Note that the article's goal is not, however, to discuss case law precedent regarding taxation issues in damage awards.

Background

In a typical commercial litigation matter, but for a contract breach or injury, the plaintiff would be able to earn certain cash flows, and would incur income taxes on the accounting income associated with those cash flows. As a result of the breach or injury, it will earn some other stream of cash flows, which will also include income tax effects. If liability is found, the plaintiff will also receive an economic damage award, which similarly is subject to income taxation. This article postulates -- and a review of the previously cited relevant professional literature generally confirms -- that the damage award should be set to create an after-tax equivalence between the non-breach scenario and the sum of the damage award and the breach scenario. That is, the plaintiff should be in the same position after-taxes with its award, that it would have been in on an after-tax basis with no breach.

As a general rule, net present value calculation should be computed on an after-tax basis, using an after-tax discount rate. Brealey and Myers state:

> *"You should always estimate cash flows on an after-tax basis. Some firms do not deduct tax payments. They try to offset this mistake by discounting the cash flows before taxes at a rate higher than the opportunity cost of capital. Unfortunately, there is no reliable formula for making such adjustments to the discount rate."*[6]

Thus, in simple algebraic terms, the equivalency postulate for economic damages is:

NPV(AT Non-Breach Cash Flows) = NPV (AT Breach Cash Flows) + (1-T)*Award

where "T" represents the tax rate applied to the damage award.

Thus, from a theoretical perspective, "making the plaintiff whole" requires "grossing-up" the difference in after-tax net present values for the tax. That is:

Award = [NPV(AT Non-Breach Cash Flows) - NPV(AT Breach Cash Flows)]/(1 - T)

Two alternative methods may be contemplated. Pre-tax cash flows could be discounted at a pre-tax discount rate; or, pre-tax cash flows might be discounted at an after-tax discount rate. Unfortunately, both of these approaches have the potential to produce inaccurate results.

The following sections demonstrate that the former approach always produces an inaccurate estimate of damages (on either a pre-tax or after-tax basis), whereas the latter approach will produce an accurate estimate of pre-tax damages only when accounting income is equal to cash flow and when tax rates are constant over time.

[6] Richard Brealey and Steward Myers, *Principles of Corporate Finance* (second edition, 1984), page 86.

Evaluation of Alternative Approaches in the Commercial Damages Context

Three simple cash flow scenarios ("cases") illustrate the impacts of these less-accurate alternatives. All scenarios involve a ten-year stream of income, depreciation, capital expenditures and taxes, and rely on the same set of economic and financial parameters, i.e., inflation, tax rate, and weighted-average cost of capital ("WACC") as the basis for the discount rate. All cases assume that the only differences between income and cash flow are capital expenditures and depreciation (thereby ignoring a plethora of other factors such as working capital changes, deferred taxes, etc. that should ideally be reflected in a more detailed cash flow analysis, if feasible).

Exhibit 1 assumes that depreciation and capital expenditures are the same in each period, such that cash flow and taxable income are the same. Exhibit 2 retains the same pattern of capital expenditures, but in which, more typically, the depreciation expenses lag the capital expenditures. Exhibit 3 assumes that depreciation expenses will exceed capital expenditures. Each case has cash flows evaluated on both a pre-tax and an after-tax basis.

For each case, net present value is calculated three ways. In the first section of calculations for each case, after-tax cash flow returns to all capital (i.e., asset cash flows) are discounted at the after-tax WACC, and then also grossed up for taxes (by dividing the prior result by the sum of 1 minus the tax rate). In the second section, pre-tax cash flow returns to all capital (asset cash flows) are discounted at both the after-tax WACC and the pre-tax WACC.[7]

[7] The following passage explains the derivation of the pre-tax discount rate from the after-tax discount rate, and also offers a word of caution in its application (echoing the similar caution expressed in footnote 4): "This presents a problem when a pre-tax discounted cash flow analysis is required. Although not completely correct, the easiest way to convert an after-tax discount rate to a pre-tax discount rate is to divide the after-tax rate by (1 minus the tax rate). This adjustment should be made to the entire discount rate and to its component parts (i.e., the equity risk premium). Take note that this is a 'quick and dirty' way to approximate pre-tax discount rates." (Ibbotson Associates, *Stocks, Bonds, Bills, and Inflation: 2001 Yearbook*, Valuation Editions, p. 77)

Exhibit 1: COMMERICAL DAMAGES EXAMPLE -- BALANCED CAPITAL EXPENDITURES AND DEPRECIATION

Economic Parameters:		
	Inflation	***3.0%***
	After-Tax (AT) WACC	***10.3%***
	Tax Rate	***37.0%***
	Pre-Tax (PT) WACC	***16.3%***

	Year 0	**Year 1**	**Year 2**	**Year 3**	**Year 4**	**Year 5**	**Year 6**	**Year 7**	**Year 8**	**Year 9**	**Year 10**
After-Tax Asset Cash Flows											
Earnings Before Interest & Depreciation (EBIDT)		10.00	10.30	10.61	10.93	11.26	11.59	11.94	12.30	12.67	13.05
Depreciation		(10.00)	(1.00)	(1.03)	(1.06)	(1.09)	(1.13)	(1.16)	(1.19)	(1.23)	(1.27)
Pre-Tax Income		-	9.30	9.58	9.87	10.16	10.47	10.78	11.10	11.44	11.78
Income Taxes		-	(3.44)	(3.54)	(3.65)	(3.76)	(3.87)	(3.99)	(4.11)	(4.23)	(4.36)
Net Income		-	5.86	6.03	6.22	6.40	6.59	6.79	7.00	7.21	7.42
Capital Expenditures		(10.00)	(1.00)	(1.03)	(1.06)	(1.09)	(1.13)	(1.16)	(1.19)	(1.23)	(1.27)
Net Asset Cash Flow	-	-	5.86	6.03	6.22	6.40	6.59	6.79	7.00	7.21	7.42
Net Present Value @ AT WACC	$33.48										
Gross Up for Taxes	*$53.14*										
Pre-Tax Asset Cash Flows											
Earnings Before Interest & Depreciation (EBIDT)		10.00	10.30	10.61	10.93	11.26	11.59	11.94	12.30	12.67	13.05
Depreciation		(10.00)	(1.00)	(1.03)	(1.06)	(1.09)	(1.13)	(1.16)	(1.19)	(1.23)	(1.27)
Pre-Tax Income		-	9.30	9.58	9.87	10.16	10.47	10.78	11.10	11.44	11.78
Income Taxes		-	-	-	-	-	-	-	-	-	-
Net Income		-	9.30	9.58	9.87	10.16	10.47	10.78	11.10	11.44	11.78
Capital Expenditures	-	(10.00)	(1.00)	(1.03)	(1.06)	(1.09)	(1.13)	(1.16)	(1.19)	(1.23)	(1.27)
Net Asset Cash Flow	-	-	9.30	9.58	9.87	10.16	10.47	10.78	11.10	11.44	11.78
Net Present Value @ AT WACC	*$53.14*										
Net Present Value @ PT WACC	$39.97										

Exhibit 2: COMMERICAL DAMAGES EXAMPLE -- DEPRECIATION EXPENSE LAGS CAPITAL EXPENDITURES

Economic Parameters:		
	Inflation	***3.0%***
	After-Tax (AT) WACC	***10.3%***
	Tax Rate	***37.0%***
	Pre-Tax (PT) WACC	***16.3%***

	Year 0	**Year 1**	**Year 2**	**Year 3**	**Year 4**	**Year 5**	**Year 6**	**Year 7**	**Year 8**	**Year 9**	**Year 10**
After-Tax Asset Cash Flows											
Earnings Before Interest & Depreciation (EBIDT)		10.00	10.30	10.61	10.93	11.26	11.59	11.94	12.30	12.67	13.05
Depreciation			(1.11)	(1.24)	(1.38)	(1.56)	(1.78)	(2.06)	(2.45)	(3.04)	(5.54)
Pre-Tax Income		10.00	9.19	9.37	9.54	9.70	9.81	9.88	9.85	9.62	7.51
Income Taxes		(3.70)	(3.40)	(3.47)	(3.53)	(3.59)	(3.63)	(3.66)	(3.65)	(3.56)	(2.78)
Net Income		6.30	5.79	5.90	6.01	6.11	6.18	6.22	6.21	6.06	4.73
Capital Expenditures		(10.00)	(1.00)	(1.03)	(1.06)	(1.09)	(1.13)	(1.16)	(1.19)	(1.23)	(1.27)
Net Asset Cash Flow	-	(3.70)	5.90	6.11	6.34	6.58	6.84	7.13	7.46	7.88	9.00
Net Present Value @ AT WACC	$31.78										
Gross Up for Taxes	*$50.45*										
Pre-Tax Asset Cash Flows											
Earnings Before Interest & Depreciation (EBIDT)		10.00	10.30	10.61	10.93	11.26	11.59	11.94	12.30	12.67	13.05
Depreciation			(1.11)	(1.24)	(1.38)	(1.56)	(1.78)	(2.06)	(2.45)	(3.04)	(5.54)
Pre-Tax Income		10.00	9.19	9.37	9.54	9.70	9.81	9.88	9.85	9.62	7.51
Income Taxes		-	-	-	-	-	-	-	-	-	-
Net Income		10.00	9.19	9.37	9.54	9.70	9.81	9.88	9.85	9.62	7.51
Capital Expenditures	-	(10.00)	(1.00)	(1.03)	(1.06)	(1.09)	(1.13)	(1.16)	(1.19)	(1.23)	(1.27)
Net Asset Cash Flow	-	-	9.30	9.58	9.87	10.16	10.47	10.78	11.10	11.44	11.78
Net Present Value @ AT WACC	*$53.14*										
Net Present Value @ PT WACC	$39.97										

Exhibit 3: COMMERICAL DAMAGES EXAMPLE -- DEPRECIATION EXCEEDS CAPITAL EXPENDITURES

Economic Parameters:		
	Inflation	***3.0%***
	After-Tax (AT) WACC	***10.3%***
	Tax Rate	***37.0%***
	Pre-Tax (PT) WACC	***16.3%***

	Year 0	**Year 1**	**Year 2**	**Year 3**	**Year 4**	**Year 5**	**Year 6**	**Year 7**	**Year 8**	**Year 9**	**Year 10**
After-Tax Asset Cash Flows											
Earnings Before Interest & Depreciation (EBIDT)		10.00	10.30	10.61	10.93	11.26	11.59	11.94	12.30	12.67	13.05
Depreciation		(11.00)	(2.00)	(2.03)	(2.06)	(2.09)	(2.13)	(2.16)	(2.19)	(2.23)	(2.27)
Pre-Tax Income		(1.00)	8.30	8.58	8.87	9.16	9.47	9.78	10.10	10.44	10.78
Income Taxes		0.37	(3.07)	(3.17)	(3.28)	(3.39)	(3.50)	(3.62)	(3.74)	(3.86)	(3.99)
Net Income		(0.63)	5.23	5.40	5.59	5.77	5.96	6.16	6.37	6.58	6.79
Capital Expenditures		(10.00)	(1.00)	(1.03)	(1.06)	(1.09)	(1.13)	(1.16)	(1.19)	(1.23)	(1.27)
Net Asset Cash Flow	-	0.37	6.23	6.40	6.59	6.77	6.96	7.16	7.37	7.58	7.79
Net Present Value @ AT WACC	$35.72										
Gross Up for Taxes	*$56.70*										
Pre-Tax Asset Cash Flows											
Earnings Before Interest & Depreciation (EBIDT)		10.00	10.30	10.61	10.93	11.26	11.59	11.94	12.30	12.67	13.05
Depreciation		(11.00)	(2.00)	(2.03)	(2.06)	(2.09)	(2.13)	(2.16)	(2.19)	(2.23)	(2.27)
Pre-Tax Income		(1.00)	8.30	8.58	8.87	9.16	9.47	9.78	10.10	10.44	10.78
Income Taxes		-	-	-	-	-	-	-	-	-	-
Net Income		(1.00)	8.30	8.58	8.87	9.16	9.47	9.78	10.10	10.44	10.78
Capital Expenditures	-	(10.00)	(1.00)	(1.03)	(1.06)	(1.09)	(1.13)	(1.16)	(1.19)	(1.23)	(1.27)
Net Asset Cash Flow	-	-	9.30	9.58	9.87	10.16	10.47	10.78	11.10	11.44	11.78
Net Present Value @ AT WACC	*$53.14*										
Net Present Value @ PT WACC	$39.97										

In Exhibit 1, the net present value of after-tax cash flows, discounted at the 10.3% after-tax WACC, is $33.48. Making this value a damage award expressed on a pre-tax basis would require grossing up for taxes to $53.14 (i.e., $33.48 divided by the sum of 1 minus the tax rate). This value represents the conceptually correct damage award, which can be then compared to the alternative calculation methodologies sometimes employed in damages analyses.

In this very simple case, the $53.14 value also results from taking the net present value of the pre-tax cash flows at the 10.3% after-tax WACC yet not grossing up for taxes. Thus, in simple circumstances, where income equals cash flow, discounting pre-tax cash flows at the after-tax WACC may produce an exactly equivalent value for economic damages. Another simplifying factor in this hypothetical case that allows discounting pre-tax cash flows at the after-tax WACC to yield the correct result is that the tax rate is constant throughout the ten-year period, and also identical to the tax rate applicable to the award. As Harold Dilbeck notes:

> *Some forensic experts propose to discount before-tax cash flows at the after-tax discount rate. Performing this calculation in this manner produces the algebraic equivalent of computing the present value using after-tax numbers and then dividing the result by one minus the tax rate. It produces a correct arithmetical result for taxable awards, provided tax rates remain constant over all periods, including the period of the award. This procedure accomplishes the gross-up and the discounting in one step. It obscures, however, the difference between the taxability of lost earnings and investment income and the taxability of the award itself; we therefore advise against this arithmetically equivalent, but obscure, approach.*[8]

By contrast, discounting the pre-tax cash flows at a pre-tax rate produces a value of $39.97, a value that is higher than the after-tax NPV, but lower than the grossed-up after-tax NPV. Thus, this alternative approach fails in even the first simple example (i.e., where income equals cash flow, and tax rates are constant throughout the entire period), as suggested by Brealey and Myers.

Turning to Exhibit 2, in which the depreciation expenses lag the capital expenditures (although the total is the same for the period as a whole), the after-tax NPV of the cash flows is $31.78, or $50.45 grossed up for income taxes, which is again the conceptually correct measure of damages. (The decline in net present value relative to Exhibit 1 results from the delay associated with earning the depreciation tax shields.) Yet the net present values of the pre-tax cash flows using either a pre-tax ($39.97) or an after-tax rate ($53.14) remain the same as they were in Exhibit 1. This error arises because the pre-tax analysis implicitly discounts only income and capital expenditures, without recognizing the changed timing of the depreciation's tax effects from the depreciation.

[8] Harold Dilbeck, "The Time Value of Money, *Litigation Services Handbook: The Role of the Accountant as Expert*" (1995), Roman L. Weil, Michael J. Wagner, and Peter B. Frank (eds.), p. 38:3.

Thus, because capital expenditures are incurred in advance of depreciation expenses, damage estimates using a pre-tax method are inaccurate, whether an after-tax or a pre-tax discount rate is applied.

Turning to Exhibit 3, in which the capital expenditures are consistently lower than depreciation expenses, the direction of the bias from using pre-tax cash flows is unclear. As shown in this example, the conceptually correct after-tax methodology produces an after-tax value of $35.72, or $56.70 grossed up for income taxes. (These values are higher than in Exhibit 1 because of the reduction in cash taxes associated with higher depreciation expenses.)

For pre-tax cash flows, the NPV based on an after-tax WACC ($53.14) remains as it was in Exhibit 1, and is lower than the grossed-up after-tax figure, indicating that this method biases damage estimates downward. However, applying the pre-tax discount rate to the pre-tax cash flows still produces a value below the conceptually correct approach (before grossing up for taxes).

Conclusions and Recommended Guidelines

From the foregoing discussion, several recommended guidelines follow:

1. The conceptually correct and reliable approach is to discount after-tax cash flows at an after-tax discount rate.

2. If the damages award is to be subject to taxation, then "gross up" the damages calculation result so as to make it the basis for an award. That is, divide the result of the after-tax damages calculation by the sum of one minus the tax rate (which is expected to apply to the damages award).

3. If for whatever reason(s) the present value calculation is not able to be performed on an after-tax basis, then discount pre-tax cash flows at an after-tax discount rate. If accounting income and cash flow happen to match one another, then this approach will yield an accurate measure of the pre-tax damages. Otherwise, the results from this approach are unreliable, with an unclear bias.

4. Although discounting pre-tax cash flows at a pre-tax discount rate may have an intuitive appeal ("apples and apples"), the results are inaccurate, although their bias at least appears to be consistent. As a measure of pre-tax damages, this approach yields results that are biased downward; as a measure of after-tax damages, this approach yields results that are biased upward.