# Back to the Future – A Round-Trip with Discounted Cash Flows

By Trevor Slack

The first of the iconic movie trilogy, Back to the Future, celebrates the 30th anniversary of its release this year. In a bid to mark the occasion, this article provides some perspectives on discounting cash flows when there are several reference points in time. This is often the case with a compulsory purchase order ("CPO").

One of the main conclusions is that it is reasonable for historical cash flows, that have become certain with the benefit of hindsight, to be discounted by a risk free rate back to a prior date of loss. Such use of a risk free rate brings consistency to the value of:

a)  damages as at a date of loss in the past; and
b)  pre-award interest.

## TYPES OF LOSSES

Litigation often involves resolving economic uncertainty to determine what would have happened, if not for a wrongful act.

In the analysis that follows, damages are cast into two types:

I.  Temporary or permanent loss of profits of a continuing business; and
II.  The loss of an entire business.

A temporary loss of profits results when the losses cease but the business resumes as it was before the wrong.

A permanent loss of profits results if the business is able to continue, but on a less profitable basis.

The loss of an entire business can probably be seen as a special case of permanent loss, in that 100% of the profits are lost forever. For example, CPOs often have prepossession losses, followed by the loss of the business, followed by post-possession liquidation costs.[1]

Damages also have time dimensions in terms of past and future loss. Temporary and permanent losses can have past and/or future components. However, the loss of a business will typically occur in the past, but the bulk of the lost value often lies in the loss of future profits.

For temporary and permanent losses of profits, the past and future components can be separated by the date of hearing (or trial).[2]

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1 There are of course many instances when a combination of the above occur. As another example, creeping expropriations often involve multiple wrongs over time.

2 Because quantum estimates have to be prepared in advance for the hearing, past losses often need to be projected beyond the actual date of the expert report up to the hearing date. This timing gap gives rise to concepts such as "expected actual" or "notional historical" etc, where losses have not yet to occurred, but are treated as being in the past.

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Future losses of profits involve uncertainty and therefore need to be discounted to determine their net present value ("NPV").  The NPV is what such profits would be worth if they could all be received today.  The problem is there is an almost infinite set of possible future outcomes, but only one will come to pass.  The discount rate is a number that absorbs this uncertainty to yield NPV.

## DISCOUNT RATES

Discount rates for risky cash flows start with the risk free rate but are then increased by the price of market risk.  The price of market risk is then scaled by the amount of market risk in the underlying asset.  The price of market risk is known as the market risk premium ("MRP"), and the amount of market risk an asset carries is its beta ("β").

This is the basis of the capital asset pricing model ("CAPM")[3], which estimates the expected return of a risky asset:

$$Ke = Rf + \beta.\, \mathrm{MRP}$$

Where:

- $Ke$ = expected return;

- $Rf$ = risk free rate of return;[4]

- $\beta$ = beta, the covariance of asset returns with the market;

- MRP = Market (aka Equity) Risk Premium.

Combining CAPM for the cost of equity with the cost of debt gives the weighted average cost of capital ("WACC").  WACC is a commonly used discount rate model and is expressed as:

$$WACC = Ke.\frac{E}{EV} \; + \; Kd.\frac{D}{EV}$$

Where:

- Ke = expected return on equity (CAPM);

- E = market value of equity;

- D = market value of debt;

- EV = enterprise value (equity + debt).

## HISTORICAL LOSSES OF PROFIT

Given the past is certain, does it mean no discounting for Type I past losses of profit? And if so, can they simply be quantified in the years in which they occur and added up?

In short, yes.

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3 Treynor (1961), Sharpe (1964), Lintner (1965), Mossin (1966).

4 The Black CAPM (1972) relaxes the need for a risk free rate via a zero beta portfolio, but its use is beyond the scope of this article.

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There might be a temptation to inflate the more distant past losses to values that are current as at the hearing date. However, if pre-award interest is applied, it should have an inflation component so this job is done.

## LOST BUSINESSES

But what about Type II claims for the loss of a business, which has been extinguished years before the hearing date? When the valuation date is set in the past, it means that all the business' cash flows should be discounted back to that date.

For many claims there will be no certainty as to what the business' historical (and future) cash flows would have been. Accordingly, these cash flows should be discounted by WACC.

Sometimes, however, there may be reasonable certainty as to what a business' historical cash flows would have been. For example, in sectors such as utilities, where income is regulated, the price per unit of output will be known. If output can also be established reliably, then historical cash flows should be able to be calculated with reasonable certainty. Similarly, in natural resources industries, historical commodity prices are usually available. Thus, if quantities can also be determined reliably, historical cash flows should again be able to be calculated with reasonable certainty.[5] This principle can extend to a business in almost any sector where quantities and prices were agreed under contract, but the contracts were not fulfilled due to a CPO. Whilst not exactly an almanac, Biff could bet on it.

But given a reasonable, or even high, level of certainty of historical cash flows, should they be discounted by WACC back to an earlier valuation date?

In short, no.

This is because WACC absorbs risk, but historical cash flows that can be calculated with certainty can have the hallmarks of risk free cash flows. Damodaran gives the following useful criteria for risk free cash flows:[6]

   a) the amount is certain
      (while the amount of the cash flows is usually at issue between quantum experts, ultimately the award decides what they would have been)

   b) the timing is certain
      (most approaches will use either midyear or year-end cash flows)

   c) there is no default risk
      (a going concern assumption is usually inherent in business valuations)

   d) there is no reinvestment risk[7]
      (by definition, none of the cash flows at issue will have been paid to the claimant)

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[5] Assuming of course that the relevant quantities would not move market prices.
6 Aswarth Damodaran, What is the risk free rate? A Search for the Basic Building Block (2008).
7 Reinvestment risk means that interest coupons are subject to being reinvested at a different rate of return than the original interest rate of the bond.

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To match risk and return, it is right that risk free cash flows are discounted by a risk free rate. To discount at WACC would lead to undervaluation as it includes risk that is not in play. Similarly, to not discount at all would lead to overvaluation if the cash flows have growth and/or inflation components.[8]

Discounting a risk free historical cash flow back to the date of loss with a risk free rate can also overcome "invalid round trips" with pre-award interest.[9] Such trips come about when losses are discounted by a relatively high discount rate (e.g. WACC), but a lower interest rate (e.g. Rf) is then used to compensate for the loss of the funds up to the award date. The respondent then stands to get a "windfall" of the difference, or a kind of litigation arbitrage if you like.

But if historical cash flows that have a) been discounted back by a risk free rate are b) also brought forward to the hearing date by a risk free rate, then the discount rate / interest rate continuum shouldn't unravel.

For historical cash flows that are uncertain, discounting by WACC back to the date of loss and then applying pre-award interest at a risk free rate should not create concern. This is because the job of WACC is to remove uncertainty from such cash flows and bring them to their NPV, which is risk free. Thus, uplifting a risk free NPV with a risk free interest rate to the hearing date is fitting.

## HINDSIGHT

Characterising cash flows that occur between the valuation date and the hearing date as being risk free through the use of hindsight might seem a slight of hand. It may also possibly be at odds with pressure/obligations on tribunals/courts to ignore post-valuation date events.

However, the courts, particularly those dealing with tax, often appear relatively relaxed about the use of hindsight if it assists them in resolving the matters before them.

From the principles laid down in *Robinson v Harman*, the aim of a judgment is to restore the claimant to the position he would have been in if not for the wrong.[10] If hindsight minimises uncertainty and meets this aim, then it is hard to see the harm.

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8 Whilst discounting certain historical cash flows by the risk free rate might be technically correct, it should be recognised that sometimes discounting by a WACC may be used for reasons of materiality, proportionality or just to keep it simple.
9 Invalid Round Trips in Setting Pre-Judgment Interest in International Arbitration (2011), World Arbitration & Mediation Review, Vol. 5:1, Abdala and Spiller.
10 Robinson v Harman (1848) 1 Ex Rep 850.

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**SUMMARY**

The need to inflate historical losses to a present value should fall away if pre-award interest is applied to them.

When the valuation date of a business is in the past, historical cash flows may become certain, or risk free, with the passage of time. This certainty can arise when historical prices and quantities can be established reliably. Historical cash flows can then be seen as risk free cash flows. To match risk and return, risk free cash flows should be discounted back to the valuation date with a risk free rate.

However, for historical cash flows that remain uncertain, a discount rate (e.g. WACC) that absorbs the uncertainty is still needed.

An extinguished business can have historical cash flows that are either risk free or risky when it is valued at a date in the past. These cash flows should be discounted by a risk free or risky discount rate respectively. The expected future cash flows will always need to be discounted by a risky rate such as WACC. The NPV of an extinguished business will be the sum of the two sets of discounted cash flows.

Discounting cash flows back to their NPV de-risks them. To compensate a claimant for loss of funds by uplifting them to the hearing date with pre-award interest at a risk free rate can avoid "invalid round trips". Hopefully Marty and the Doc can rest easy…

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