

# **Valuation of Loss of Earnings**

**John G Errington**

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The opinions expressed in this paper are those of the author and do not necessarily represent those of the author's previous employers or colleagues.

The paper has been peer reviewed by Bernie Higgins.

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# 1 Introduction

This paper covers the role of actuaries engaged to provide expert witness services for placing a value on loss of earnings.

The actuary is usually engaged by the Briefing Counsel to provide an assessment of the value of loss of earnings of the Plaintiff being sought from the Defendant. The Briefing Counsel, and therefore the actuary, may be acting for either the Plaintiff or the Defendant.

The most common scenario leading to a claim for loss of earnings is where the Plaintiff has been employed by the Defendant and it is alleged by the Plaintiff that the Defendant, by some action or inaction, has caused the Plaintiff to suffer some loss of earnings, both in the past and, possibly, also in the future. In many cases the Plaintiff has ceased to be an employee of the Defendant some time prior to the date of the Court hearing.

There have also been cases where the Defendant has not been the Plaintiff's employer but has been an Agency which, by its actions or inactions, the Plaintiff alleges has caused the Plaintiff to suffer some loss of earnings in the past, and possibly in the future.

It is not the role of the actuary to give views or evidence on whether the Defendant's actions, or inactions, have caused the Plaintiff to suffer a loss of earnings. That is the role of the Court. The actuary's role is to assist the Court to place a value on the loss of earnings, if the Court decides that there is a need for the Defendant to make compensation to the Plaintiff.

## 1.1 Code of Conduct

In carrying out his or her role the actuary is subject to the Society's Code of Conduct and also the Code of Conduct for expert witnesses as set out in Schedule 4 to the High Court Rules.

There is a remarkable similarity between these two Codes of Conduct and both are set out in the Appendix.

## 1.2 General Approach

In my opinion any assessment of the value of loss of earnings needs to consider and address all of the following:

- Determine what the Plaintiff's earnings have actually been in the period to the present time and anticipated actual earnings in the future up to a predetermined date or age (often age 65) (actual earnings).
- Determine what the Plaintiff's earnings could have been (or would have been) had the matters under which the Court is being asked to make a decision not occurred, both up to the present time and in the future to a predetermined date or age (expected earnings).
- These earnings determinations are usually made on a yearly basis. I generally prefer to use March years as this makes the tax calculations easier.
- Earnings are usually expressed as gross earnings (before the incidence of personal taxation). As the objective of compensation for loss of earnings is usually to place the person in the same position they would have been had the loss of earnings not occurred, it is appropriate to take account of personal taxation so as to determine the actual cash in hand that the person would have had net of taxation.

- In order to determine, on a yearly basis, the shortfall of cash in hand, each of the actual earnings and expected earnings should be reduced by the levels of personal taxation applying in each of the years under review. The differences between the net (after tax) earnings amounts in each year therefore represent the cash in hand shortfall for each year.
- The degree to which the matters on which the Court is being asked to make a decision has caused the shortfall in earnings each year needs to be determined and applied to the yearly shortfalls. This I call the %causal contribution+. The degree and incidence of causal contribution is invariably a matter for the Court to determine.
- The yearly amounts of cash shortfall then need to be adjusted to recognise the time value of money so that the loss of earnings compensation paid at the payment date fairly represents (in today's dollars) the past shortfalls and the expected future shortfalls.
- Finally, adjustments may need to be made to the resulting present day dollar value to reflect the tax treatment of any compensation payments that may be paid to the Plaintiff. The objective is to ensure that the lump sum compensation amount, after any tax payable, fairly represents the amount of cash in hand that the Plaintiff would have now had compensation occurred annually on the basis of the Court's assessment of their loss.

### 1.3 Definitions

I use the expression %Event+to mean the event (or events) which has given rise to the Court action. The Event is often an employment related matter, such as alleged unjustified dismissal. It could also be the actions or inactions of an Agency which are alleged to affect the Plaintiff's earnings or earning capacity.

I use the expression %actual earnings+to mean the earnings the Plaintiff has actually received since the Event up to the present time (the %valuation date+), and the anticipated earnings the Plaintiff will have in the future up to the predetermined date or age.

I use the expression %expected earnings+to mean the earnings the Plaintiff would have had since the Event if the Event had not occurred, both up to the present time and in the future up to the predetermined date or age.

### 1.4 Valuation Objective

The difference between actual earnings and expected earnings represents the loss of earnings, before the application of any causal contribution.

It can be noted that the overall thrust of this approach is to determine an amount of cash in hand (ie, after tax on any gross compensation payment) which, taking into account casual contribution, fairly represents, in today's dollars, the total of:

- The shortfall of earnings in the past, and
- An amount which, if prudently invested, can be expected to provide the cash in hand shortfall of future earnings.

The remainder of this paper discusses the approaches that can be taken for each of the above steps.

## 2 Actual Earnings

Earnings history since the Event up to the present time is usually readily available through tax records, employment records, or accounting records (for self employed). This is referred to as past actual earnings.

Future actual earnings represents the future earnings that the Plaintiff is anticipated to earn up to the predetermined date or age. This will normally be based on the current occupation of the Plaintiff. The determination of future actual earnings may need to consider (in no particular order of significance):

- The extrapolation of past actual earnings
- Probabilities of promotion (see section 3.1.1 for further discussion)
- Salary or wage inflation
- Probabilities of death or disability
- Probabilities of early retirement
- Non cash employment benefits (such as superannuation)
- Self employment expenses
- Probabilities of change in employment

Salary or wage inflation assumptions are usually based on past data (eg growth in National Average Wages). Salary inflation is often assessed as a constant addition to Consumer Price Inflation. It should be remembered that historic data for salary and wage growth includes some element of promotion effects, as it is measured by observations of actual salaries and wages. Thus, there is some risk of double counting of promotion effects.

As an aid to the Court in deciding what is reasonable to set as a base for future actual earnings, I have found it useful to set a few scenarios (with explanation and key reasons why they could be adopted) to show the effects of different assumptions and different weightings. The Court can then decide which it prefers.

As most superannuation schemes are now of the accumulation type, employer contributions (if any) can usually be taken as a direct supplement to earnings. Otherwise the value of expected benefits can be used.

Whether or not past or future actual earnings need some adjustment for causal contribution is addressed in section 5.

### 3 Expected Earnings

Past and future expected earnings represent what the plaintiff could (or would) have earned had the Event not occurred.

#### 3.1 Employment Related Cases

In employment related cases this usually means estimating what the Plaintiff's remuneration would have been had their employment continued with their current employer.

The determination of expected earnings may need to consider (in no particular order of significance):

- Probabilities of promotion (see section 3.1.1 for further discussion)
- Salary or wage inflation
- Probabilities of death or disability
- Probabilities of early retirement
- Probabilities of resignation/career change/redundancy
- Non cash employment benefits (such as superannuation)

##### 3.1.1 Promotion

To take into account promotion one needs to consider:

- Possible promotion paths or steps
- The probability that those promotions would have occurred
- The likely timing of those promotions
- The financial impact of promotions

A useful starting point is the laying out of promotion sequences and the current remuneration associated with each step.

It is usually appropriate to assume that the remuneration of each step will increase at the rates of salary or wage inflation.

The assessment of the probability of promotion can be approached in two ways:

- Using past data of numbers eligible for promotion at each step compared with the numbers actually promoted . this can then give a probability of promotion at each step based purely on statistics, or
- Using the evidence of other expert witnesses

If past data is used to assess probabilities of promotion then the actuary should be careful to set out the actual data used, the source of the data, and any implicit or explicit assumptions made.

The assumptions to be used for the timing of promotions usually need the input of other expert witnesses.

With these inputs, it may be possible to build up a reasonable estimate of incidence and timing of promotions with consequent input into a likely expected earnings stream.

It can be useful, to assist the Court, to establish a number of promotion scenarios+with associated earnings stream results.

In my view, it is not appropriate without very strong supporting reasons for an actuary to take extreme views on promotion. Extreme views can range from assuming 100% certainty of promotion to each possible level at the earliest possible time, to no promotion at all.

See also my comments in section 2 regarding promotion implicit in salary inflation.

### **3.1.2 Decrements**

Probabilities of death, disability, redundancy, or early retirement should be allowed for in the calculations.

Employment specific decrements, if available, should be used.

Consideration should also be given to any additional benefits that may be payable on any of the contingencies, as well as what earnings can be expected after the decrement.

### **3.1.3 Contingencies**

If promotions and decrements have been properly considered and allowed for then no arbitrary allowance for contingencies is needed.

It is my view that actuaries do the profession a disservice by making arbitrary allowances for contingencies in loss of earnings cases.

However, the Court sometimes introduces its own contingency allowances when making directives, and there may be unquantifiable contingencies/opportunities arising from lump sum compensation, eg utility of cash.

## **3.2 Non Employment Cases**

These cases can arise where the Plaintiff alleges that the action or inaction of an Agency has lead to a permanent inability to reach one's full earning capacity. If the action or inaction of the Agency occurred in childhood then the determination of expected earnings does not necessarily have any sound employment history as a base.

In the absence of any sound employment history the use of national average total time earnings can be used. This data is available from labour markets statistics published by Statistics New Zealand and the Department of Labour. It is available for males and females separately.

It may be appropriate to take into account the observed correlations between levels of education and levels of earnings. Census data from Statistics New Zealand shows that there is some correlation between education levels and earnings levels. The national average wage figures are averaged across all employed people in the workforce and include all levels of education. One can then adjust the national average total time wage to reflect the reasonable expectation of a level of education that may have been attained by the Plaintiff.

Depending on the level of education that may have been attained by the Plaintiff, a suitable proportion of national average total time wage can be estimated.

It may also be appropriate to take into account the fact that not all males/females in the workforce are employed at any point of time.

Proportions of the workforce unemployed are available from the same data sources as average earnings. When people are unemployed one can assume that they would be entitled to the unemployment benefit and so one can calculate expected earnings each year by using the following formula:

*Expected earnings*

**equals** *Average total time wage (adjusted for education) x proportion of workforce in employment*

**plus** *Unemployment benefit x proportion of workforce not in employment*

## 4 Taxation

### 4.1 Taxation of Income

So far the levels of expected and actual earnings (both past and future) have been covered.

These levels of earnings are gross of tax.

The objective of the loss of earnings exercise is to place the Plaintiff in the same financial position (taking into account causal contribution) that they would have been had the Event not occurred.

As the Plaintiff would have had to pay personal income tax on either stream of earnings, the measurement of loss in terms of cash in hand in each year of loss can be determined. This is done by applying the personal rates of tax, at the appropriate rates for the year, to each of the expected and actual earnings each year.

Thus, the yearly cash in hand loss (before the application of casual contribution) is determined. This is often referred to as the yearly shortfall amounts.

### 4.2 Taxation of Compensation

The amount of compensation actually payable needs to take into account:

- Whether tax is payable on the compensation payment, and
- The rate of such tax.

It is my understanding that compensation payable for loss of earnings where that loss is directly related to earnings is fully taxable as earned income in the year that it is payable. In those circumstances it is in order to gross up the compensation payable to recognise the tax that will be payable.

It is also my understanding that compensation payable in non-employment cases may not be subject to tax.

In any event, it is appropriate for the Court to be appraised of the likely tax situation, the effect on the gross compensation amount, and the consequential treatment that should be applied to the calculated compensation amount.

In my experience, the Court recognises the need for tax treatment of both the income streams and the compensation payment. In respect of the compensation payment, if there is any uncertainty regarding the tax treatment, it is appropriate to include wording similar to the following in a Brief of Evidence:

*"I have had regard to the expected tax treatment of any compensation that may be awarded by the Court to represent loss of earnings. It is my understanding that such compensation would not be taxed as earned income in the hands of the person receiving the compensation and so no adjustment needs to be made to the loss of earnings figures generated by my compensation calculations. The compensation figures I calculate are therefore net of tax but would need adjustment if tax is payable on any compensation amounts paid to the Plaintiff."*

## 5 Causal Contribution

The degree to which the difference between expected earnings and actual earnings for the Plaintiff is directly attributable to the actions or inactions of the Defendant for which the Defendant is legally responsible is a matter that only the Court can determine. I call this the %casual contribution+. The causal contribution may vary from year to year and needs to be applied to the yearly shortfall amounts.

There are two general ways in which causal contribution can be applied:

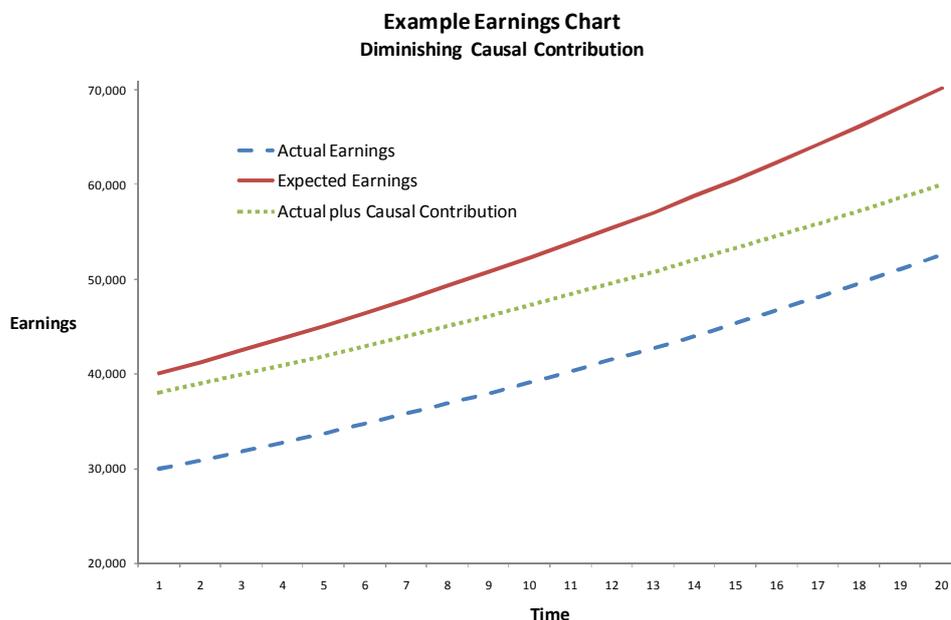
Firstly, the Plaintiff's actual earnings may have been directly impacted by choices the Plaintiff has made. For example, on ceasing employment the plaintiff may have made a lifestyle choice to significantly reduce the number of hours work they do on an ongoing basis. This would impact on the actual earnings and increase the yearly shortfall to an extent that the Defendant should not be liable.

Secondly, the effect of the Event may have varying effect on the yearly shortfalls. For example, an unjustified dismissal may have a short term, and declining effect, on a Plaintiff's career.

The assessment of impact and degree of causal contribution will not necessarily be the province of the actuary and expert views of others may be put forward.

The actuary can, however, build into their calculations a varying yearly casual contribution to reflect others' views and so enable the Court to determine the appropriate level.

A graphical representation of causal contribution can be helpful to the Court:



Importantly, the actuary's Brief of Evidence should clearly show the degree of causal contribution assumed.

## **6 Time Value of Money**

We now have a yearly shortfall, net of tax, and adjusted for causal contribution.

In order to recognise the time value of money, it is necessary to adjust the shortfalls in each year to recognise that the date of payment of any compensation is different to the date that the shortfall arose. This is so that the Plaintiff can be in the same position today that they would have been had the shortfall not occurred.

### **6.1 Accumulation of Past Shortfalls**

In respect of past shortfalls, the Plaintiff may have spent the shortfall in any year on consumables (eg food, entertainment, or consumer goods) or may have saved part or all of it. If the money would have been spent on consumables then it would be reasonable if the compensation paid today would enable the same possible basket of consumables to be purchased today. This would indicate that the shortfall in any one year should be adjusted by the growth in Consumer Price Index (CPI) from that time to the present.

If the past shortfalls had been invested it would be reasonable for the compensation to be equal to the amount that the investment would have accumulated up to the present time. This would indicate that the shortfall should be adjusted by a reasonable investment return (net of any tax that would have been paid on investment income) up to the present time.

It is possible that the shortfall may have been applied to the reduction of debt which would indicate a rate of return linked to debt interest rates.

There is no way of knowing with certainty what the Plaintiff would have done with each yearly past shortfall. The actuary may have a view on this, or may be influenced by other evidence. In the absence of other evidence, it may be appropriate to assume that the shortfalls would have been spent on consumables, if the levels of past expected earnings were modest. Otherwise an assumption that the shortfalls would have been saved may be more appropriate. The actuary should indicate which approach has been taken, and why.

### **6.2 Discounting Future Shortfalls**

In respect of future shortfalls, one needs to determine the amount that would need to be invested at the date of compensation payment so that the future yearly shortfall amounts can be replicated by a yearly drawdown from the investment. If a lump sum is invested then the investment income generated by that investment would be taxable in the hands of the investor. Therefore a net of tax discount rate should be used to discount future shortfall amounts.

One needs to consider what investment strategy (in terms of risk) that the Plaintiff would be likely to choose. A low risk strategy would assume fixed interest investments dominate the portfolio mix. A conservative investment strategy would assume some equity investments. A long term (for the duration of the future shortfalls) investment return then needs to be determined and applied (net of tax) to discount future yearly shortfalls.

The actuary should state any strategy assumptions made as well as justifying the eventual discount rate

## 7 Brief of Evidence Disclosures

In my view, the actuary's Brief of Evidence should clearly state:

- All assumptions made in the calculations, together with the reasons for making each particular assumption
- Which assumptions have the more significant impact on results
- What tax rates have been used and how they have been applied
- Full details of any scenarios used, why they have been chosen, and their impact on the compensation amount
- How actual earnings have been established (including data sources) or determined and any assumptions made
- How expected earnings have been determined and any assumptions made
- What assumptions have been specified by their client and their view on those assumptions
- The source of all significant data and their views on its accuracy and appropriateness of its use

The Brief of Evidence should also show how the compensation amounts have been arrived at, ie the calculation process.

It is, in my view, useful to show in an appendix:

- Yearly actual earnings used, before and after tax
- Yearly expected earnings used, before and after tax
- Yearly other income used, with appropriate tax treatment
- Resulting yearly shortfall net of tax
- Impact of yearly casual contribution

In my experience, it is also useful to the Court if a note can be prepared showing the differences between each side's actuary's approaches in terms of:

- Calculation methods
- Assumptions
- Impact on compensation amounts

## **8 Peer Review**

In many cases I have been involved in it has been apparent that no independent checks have been carried out on the actuary's calculations and that no peer review has been done on the approach, methodology, and assumptions.

This sometimes results in corrections needing to be made to Briefs of Evidence already in front of the Court.

I have also seen cases in which, in my view, the actuary is blatantly acting as an advocate for their client.

These situations clearly do not enhance the image of the actuarial profession.

In my view any actuary carrying out work as an expert witness would be well advised to have their work checked and peer reviewed by another actuary well versed in such work, prior to the Brief of Evidence being finalised

## **APPENDIX – Codes of Conduct**

### **High Court Rules**

#### **Schedule 4**

#### **Code of Conduct for expert witnesses**

##### **Duty to the Court**

1. An expert witness has an overriding duty to assist the Court impartially on relevant matters within the expert's area of expertise.
2. An expert witness is not an advocate for the party who engages the witness.

##### **Evidence of expert witness**

3. In any evidence given by an expert witness, the expert witness must
  - (a) acknowledge that the expert witness has read this Code of Conduct and agrees to comply with it;
  - (b) state the expert witness' qualifications as an expert;
  - (c) state the issues the evidence of the expert witness addresses and that the evidence is within the expert's area of expertise;
  - (d) state the facts and assumptions on which the opinions of the expert witness are based;
  - (e) state the reasons for the opinions given by the expert witness;
  - (f) specify any literature or other material used or relied on in support of the opinions expressed by the expert witness;
  - (g) describe any examinations, tests, or other investigations on which the expert witness has relied and identify, and give details of the qualifications of, any person who carried them out.
4. If an expert witness believes that his or her evidence or any part of it may be incomplete or inaccurate without some qualification, that qualification must be stated in his or her evidence.
5. If an expert witness believes that his or her opinion is not a concluded opinion because of insufficient research or data or for any other reason, this must be stated in his or her evidence.

##### **Duty to confer**

6. An expert witness must comply with any direction of the Court to
  - (a) confer with another expert witness;
  - (b) try to reach agreement with the other expert witness on matters within the field of expertise of the expert witnesses;
  - (c) prepare and sign a joint witness statement stating the matters on which the expert witnesses agree and the matters on which they do not agree, including the reasons for their disagreement.
7. In conferring with another expert witness, the expert witness must exercise independent and professional judgment and must not act on the instructions or directions of any person to withhold or avoid agreement.

## **NZ Society of Actuaries**

### **Code of Professional Conduct**

#### Section 5.3.7

If a Member is acting as an expert witness, the Member is an advisor to the court and should not act as an advocate for his or her Client. In this capacity, the Member must ensure that Actuarial Advice given is not affected by which of the parties the Member is acting for.