

## A. Contingency & present-value factors

This appendix describes the *contingency* factors that may apply to lost income and future cost of care, and the *discount* or *present value* factors that apply to future losses and costs of care. To begin, some definitions:

The trial or other *reference date* divides *past losses*, which will have already occurred and which attract Court order interest, from *future losses*, which will follow and are discounted.

A negative *contingency* adjusts or reduces a future loss by the statistical chance that it might not arise or a past loss by the statistical chance that it might not have arisen.

The *present value* of a series of certain future annual payments or losses recognizes the *time value of money*, namely that because of interest, a future dollar is worth less than a dollar today: getting a dollar a year from now requires investing only about, say, 97¢ today, so a dollar two years hence requires investing about 93¢ now. The present value is the amount that if invested now would yield the future annual payments (of principal and interest). *Discounting* and discount factors translate future amounts to present ones.

The *contingency-adjusted present value* of a stream of contingency-adjusted annual future losses is the lump sum that, if invested, would yield the annual payments of principal and interest that would exactly compensate for each year's contingency-adjusted loss, and then would exhaust to nil when the losses end — at retirement (for employment income), at death (for future cost of care), or at some projected earlier date.

A *multiplier* represents the contingency-adjusted present value of a series of uniform future annual payments, usually \$1,000 per year, for its stated period. A multiplier of, say, 12,345 per \$1,000 per year would make good a loss of \$1,000 per year. A constant series of \$10,000 per year would have a contingency-adjusted present value of \$123,450. Since a multiplier cannot give the present value of future losses that are not constant, the schedules also show each year's value and its cumulative and remaining totals; the final table of the report shows examples of using them.

In the schedules, the contingency-adjusted present values appear in the right-hand columns: the present value of each future year in the "Annual" column, the cumulative totals beginning "From start," and the amount remaining at the year's end. The remaining totals apply where some effects begin or end at various times; they are accumulated backwards from the period end or latest potential date (often retirement or death). The value for an intermediate period of years is the difference between the beginning and ending totals (or the preceding and ending "remaining" totals). Annual figures might not add exactly to the totals, though, because *rounding* affects the numbers printed (but not the actual calculations).

### A.1 Discounting and present values

Regulation 352/81 under §56 of the *Law and Equity Act* sets the discount rate for indexed or price-level adjusted future amounts at 3½% per year net of inflation. This low 'real' rate implicitly adjusts for price inflation, presuming that invested assets would earn, on average, 3½% per year more than the rate of inflation: with just under 2½% annual inflation, for example, the nominal interest rate would be 6% [ $\approx \{(1.0350) \times (1.0242) - 1\} \times 100\%$ ]. Because real earnings tend to rise somewhat faster than prices, the regulations set a 2½% discount rate for *employment income* and for amounts derived from it, like personal or survivors' consumption or support payments.

Because incomes are received and expenses are paid throughout the year, rather than just at year-ends, the discount factors are applied at midyear: in effect, only half a year's discounting applies to the first year's payment or loss, but then the full rate applies to the second and later years. For employment income before contingencies, the first-year factor is 98.773% and the second-year factor is 96.364% [ $= 98.773\% \div 1.025$ ]. For future care before contingencies, the first-year factor is 98.295%; the second-year factor is 94.971%.

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### A.2 Future losses — the survival or mortality contingency

The first contingency factor is premature mortality — the chance that the future income, loss, or payment might not occur in some year because the subject might not survive until then. For BC residents, the typical annual *survival* probabilities for someone of the subject's sex and age are computed from Statistics Canada's life tables for British Columbia, 2000 ~ 2002 (restated for 2005 ~ 2007 life expectancies at birth); the probabilities would be adjusted for any matters affecting life expectancy. Survival factors too apply at midyear.

The *actuarial multiplier* on employment income and the *cost-of-care multiplier* incorporate only the prescribed discount rate and the survival contingency.

### A.3 Employment income — the labour-market contingencies

The *labour-market contingencies*, which the *economic multiplier* incorporates, represent the statistical chance that someone who is alive and presumably working or seeking work may not earn the projected full-time, full-year income. While 20% is the traditional allowance, statistics can usually tailor the figure to fit the circumstances of each case. The risk typically has three statistical components:

- i. *Participation* (in the schedules, "Particip") — This affects everyone since, to earn any income, the subject must be in the labour force — 'participating' by working or actively seeking work. The participation rate shows the statistical likelihood that someone similar to the subject would be in the labour force, and the complement (the amount by which the rate falls below 100%) gives the risk that he or she would not.

Statistical participation rates usually depend upon the subject's *age* (younger persons may be in school, experience may bring greater earnings and other rewards in the prime working years, older persons may have retired or become disabled), *educational level* (more education is associated with greater attachment to the labour force and with potentially higher-paying, more enjoyable work, which tends to induce people to work more or longer), and *gender* (women, although conditions have improved and their average rate has continued to rise, remain likelier than men to have competing responsibilities, especially at those ages when children are younger or parents are older). Statistical participation rates are usually extracted for five-year age groups from special tabulations by Statistics Canada of the 2006 Census in British Columbia.

For persons established in the work force, the rate is 100% less the chance that he or she will leave or have left it; this is found by removing the proportion of statistically similar people who are already out of the work force. For those older workers who presumably do not intend to retire, the risk of nonparticipation may depend upon their statistical risk of involuntary withdrawal due to injury or disability.

- ii. *Unemployment* ("Unemp") — The risk of unemployment also offsets potential full-time, full-year earnings — unless someone is self-employed, effectively self-employed (like a commission salesman), or expects earnings that allow for periods out of work and drawing unemployment insurance (like a fisherman or logger).

Without a specific occupation, this comes from Census statistics for the same categories as for participation rates (by age, education, and gender); these rates, based upon the Census year, are adjusted for subsequent changes in overall provincial unemployment. For specific occupational groups, we normally use Human Resources Development figures for the available years, since 1990.

- iii. *Working less than full-time* ("Part-time") — If someone is presumed to work full-time, the chance that he or she may work less than that reduces the projected full-time earnings. The part-time factor, also extracted from the 2006 Census (by age, education, and gender), gives the amount that part-time work reduces average earnings. It can also be adjusted for persons already in the work force and working full-time, full-year.