

Appendix B

Income-tax grossups

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This appendix sums up the general considerations in estimating tax-grossup allowances on awards invested to meet future losses — except those to replace wages or profits. Since such replaced incomes would have been taxable, those funds are not protected. Typical protected awards for an injured person include costs of care, reduced domestic capacity, and increased probability of divorce; a survivor protects awards for loss of support (from the after-tax income of the deceased) and services.

The need for a tax grossup on an award that is to provide compensation over a future period or a lifetime arises because even though the award is not itself taxable,¹ the investment income on it is taxable.² The award amounts are the present values of future losses or outlays. The discount rate presumes that the funds invested to meet future needs will earn interest or other investment income until withdrawn — making the present value of the future needs or losses less than the total of the eventual amounts. Without further compensation — without adding the grossup to the invested principal — income taxes on the investment income will reduce the actual net returns below those presumed and so tend to exhaust the funds prematurely, before they have met the future needs.³

B.1 Determinants of the grossup award

The size of the grossup depends upon taxes on the earnings of the fund, and the taxes in turn depend upon several factors, some set by the circumstances of the award, some by the beneficiary, some by the economy and tax system. In general, they include these:

Tax system — The current tax system of rates, brackets, credits, indexation of brackets and credits for inflation, treatment of investment income, and inclusion or exclusion of other amounts is presumed to persist, except for announced or enacted changes.

Award size — The grossup depends on the amount of the basic award to be invested: larger principals yield higher returns, which face higher tax brackets and rates and thus a higher grossup.

Protected period — The grossup depends on the length of the lifetime or period covered: the longer the period, the more years' taxes and greater the grossup.

Perspective — In projecting the inflation rate and the composition of the fund investments over someone's lifetime, a long-term point of view is appropriate.

Other income — A beneficiary's other, unprotected income, which occupies the lower tax-rate brackets, affects the tax rates likely to apply to fund earnings. Unprotected or 'first-dollar' income includes any wages, profits, or pensions, as well as the earnings on a fund to make good such losses.

Future inflation — While full indexing has returned to the tax brackets and credits, inflation still enters into tax calculations because taxes apply to nominal earnings — based on nominal rates of return that include the inflation rate. Taxes apply to inflated or current-dollar future earnings and so on the nominal rate of return on the effective balance. The future tax brackets also depend on the projected inflation rate. That rate of return approximates the projected inflation rate plus the prescribed real or inflation-adjusted rate of return, 3½%.⁴

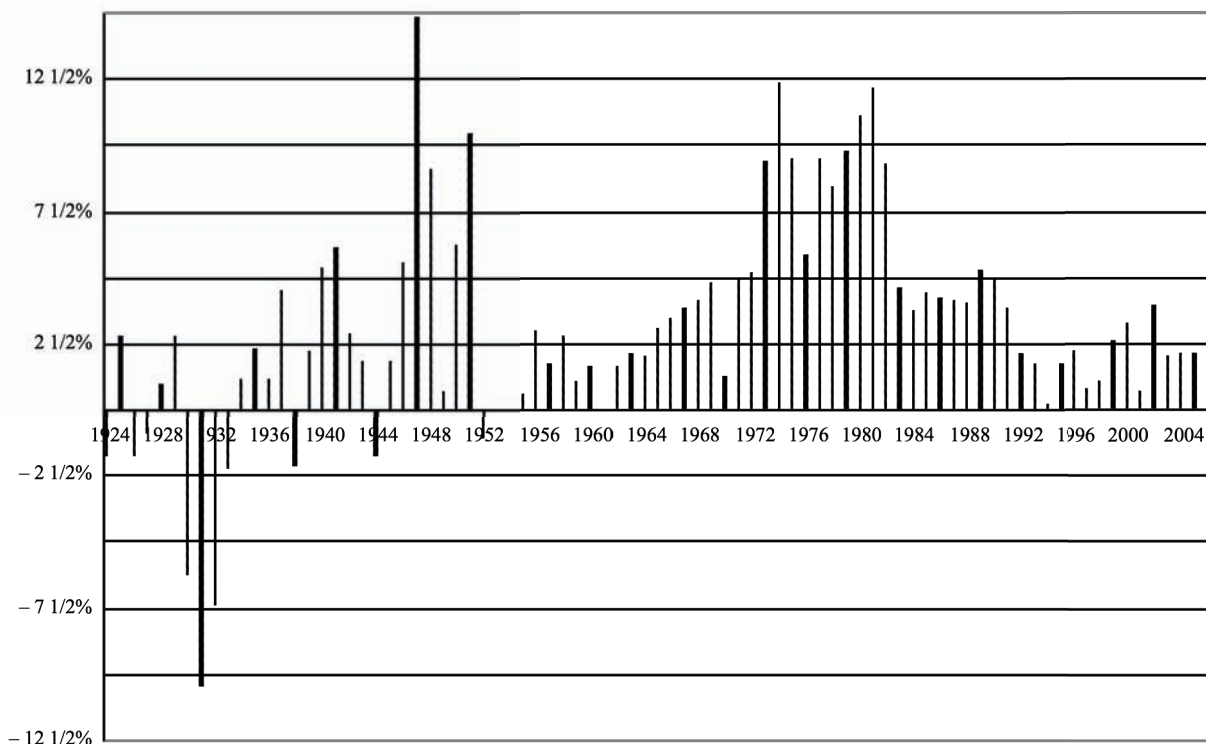
Income mix — Because dividends and capital gains are taxed more lightly than interest, the grossup also depends upon the mix of assets and thus the mix of investment incomes. Receiving only interest would imply the highest allowance, while a fund that earned only dividends and capital gains needs a smaller allowance.

B.2 The projected inflation rate and the nominal rate of return⁵

This Figure B-1 and Table B-A (below) show the history of the Consumer Price Index [CPI], which increased at an average rate of 4.1% for the past 50 years and 3.2% for the past 80 years but has stabilized in the range of 2% ~ 2½%. Standard deviation, or volatility, which had averaged 3.2% and 4.2% over the 50 and 80 years, respectively, has settled into the 1% range. The highest rates occurred in 1947 ~ 1951, after the end of the restrictions of World War II, and in the years 1973 ~ 1982, which included the first and second oil-price shocks. Falling fuel prices drove the annual rate down to 0.1% in the 12 months to September 2006; rising and then falling fuel prices brought this rate to 1.4% in January 2009 and 1.9% in the five years 2002 ~ 2008. A long perspective seems appropriate.⁶

The likelihood of continuing such price stability increased in the 1990s due to several political or institutional factors, especially strengthening the independence of the Bank of Canada, the Bank's policy of holding the inflation rate at or below 2%, the political consensus rejecting government deficits in normal times, and the availability of competitively-priced imports. This is fortunate for future investment returns, since returns on all classes of assets tend to fall as the inflation rate rises.

Figure B-1
Annual CPI changes 1924 ~ 2006



That history suggests that inflation will fall just short of 2½% over a lifetime. Thus nominal earnings, at the prescribed real or inflation-adjusted rate of return of 3½% and the nearly 2½% rate of inflation, would average 6% per year.⁷

B.3 Returns, risks, and the investment mix⁸

An investment manager selects the asset mix so as to balance desirably higher returns with the generally greater risk of higher-yielding assets, considering as well the income-tax system and the circumstances and needs of the beneficiary. A balanced portfolio typically includes Canadian stocks and fixed-interest assets, as well as perhaps foreign stocks and other assets — with the mix selected under considerations like these:

i. Returns

This Table B–A shows the inflation or CPI-change rate and the real or inflation-adjusted rates of return or interest on high-quality Canadian stocks (those listed on the Toronto Stock Exchange [S&P/TSX]), long-term Government of Canada bonds, 91-day Treasury or T-bills, and diversified pension funds.⁹ Stock returns consist of capital gains plus dividends. Long-term bond returns include capital gains due to interest-rate declines and losses due to interest rate rises. Pension funds hold stocks, bonds and shorter-term fixed-interest securities, and perhaps other assets.

	80 years 1927 ~ 2006	50 years 1957 ~ 2006	25 years 1982 ~ 2006	15 years 1992 ~ 2006	10 years 1997 ~ 2006	5 years 2002 ~ 2006
<i>Average inflation = rates of CPI change</i>						
Consumer Price Index [CPI]	3.2%	4.1%	3.0%	1.9%	2.0%	2.4%
<i>Average real rates of return</i>						
Canadian stocks (S&P/TSX), mean	6.6%	5.6%	7.5%	9.2%	7.8%	10.5%
Fixed interest, mean						
Canada long bonds	2.9%	3.4%	8.9%	7.8%	6.3%	6.4%
91-day T-bills		2.5%	4.1%	2.7%	1.7%	0.7%
Pension-plan assets, median		† 4.7%	7.9%	7.8%	6.5%	6.1%
<i>Standard deviations or measures of variability</i>						
Consumer Price Index [CPI]	4.2%	3.2%	1.9%	1.0%	1.0%	0.9%
Canadian stocks (S&P/TSX)	18.4%	15.6%	15.3%	14.8%	16.2%	19.7%
Fixed interest						
Canada long bonds	9.7%	10.6%	10.8%	10.0%	7.4%	3.5%
91-day T-bills		2.8%	2.5%	2.0%	1.6%	1.7%
Pension-plan assets		† 12.9%	6.9%	6.9%	5.9%	7.1%
§ <i>Canadian Institute of Actuaries, Report on Canadian Economic Statistics, 1923 ~ 2006 [Ottawa: 2007, and prior issues]</i>						
† <i>“50 year” pension-plan return is for the 47 years 1960 ~ 2006.</i>						

Stocks outperformed T-bills, as expected, in 46 of the last 72 years. Stocks have outperformed bonds in 48 of the 83 years since 1924, and they have averaged better returns than bonds over the 80 years since 1927 and over the 50 years since 1957. Bonds’ better relative performance in the 25 years since 1982, though, warrants a closer look, even after allowing for the tech-market collapse in 2001 and 2002.

Pension plans, meanwhile, tend to achieve lower real returns than the stock and bond indices do. They do so because of the costs of managing actual portfolios (like actual mutual funds). They also do so because the table’s pension figures show the median (half the funds earn more, half earn less) while the indices show the arithmetic averages (the median suppresses the high returns of the better performers, which tend to outweigh the losses of the worst).

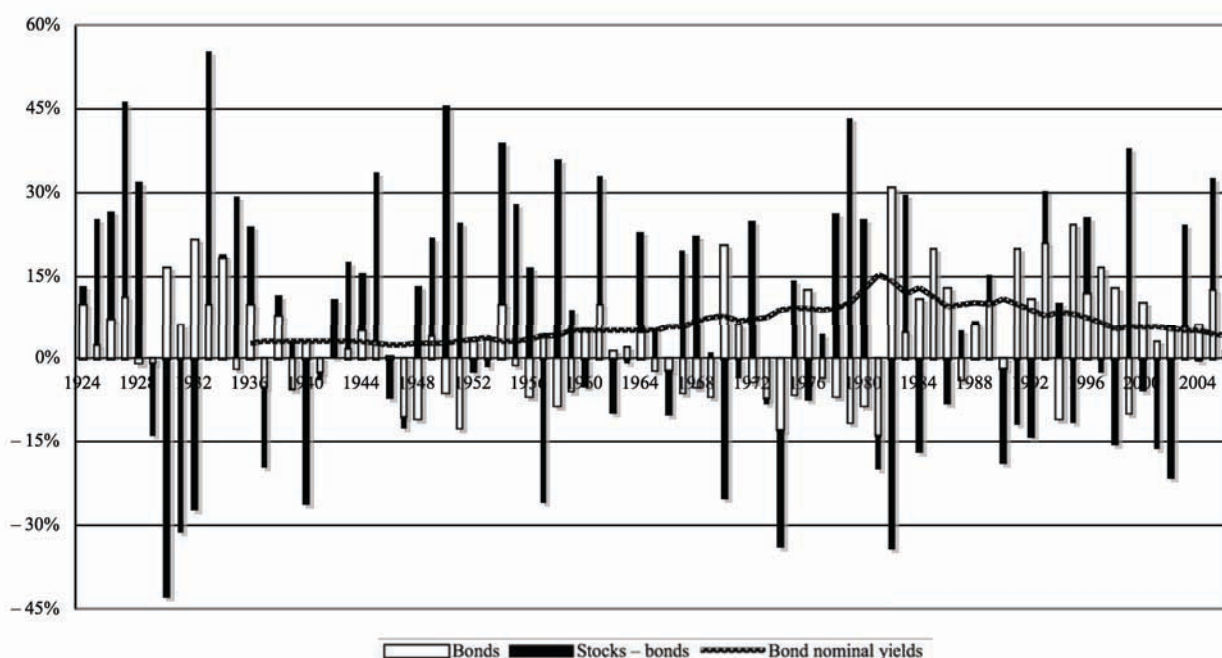
Appendix B

Income-tax grossups

B.3 Returns, risks, and the investment mix

This Figure B–2 compares the real or inflation-adjusted annual returns from holding stocks and bonds for the years since 1924. For each year, its white bar shows the bond return (interest plus gains), and its black bar shows the amount by which the year's average real stock return (dividends plus gains) exceeds or falls short of the year's average real bond return; a positive value means that stocks outperformed bonds. The figure also shows the nominal interest rate on bonds for the years since 1948 (grey line — before inflation adjustment). A larger version of the figure follows page B–8. Stocks bested bonds, as noted, in 48 of the 83 years to 2006.

Figure B–2
Annual bond returns and excess of stock returns over bonds
1924 ~ 2006, and bonds' nominal yields 1948 ~ 2006



Interest rates, as represented by Canada long bonds before inflation adjustment, rose fairly steadily to a peak of 15.2% in 1981 and then tended to fall through the 1980s and 1990s. Falling interest rates (which create a gain for bonds) coincide with the last 25 years and account for half of the years in which bonds outperformed stocks; without those years in the last 25, 15, and 10 years, stocks have tended to return 1% ~ 2% more than bonds. Bonds also outperform stocks when the stock market falls, but then bonds either have positive returns (14 years, as in 1930 ~ 1932 and 2001 ~ 2002) or lose less than stocks (nine years, most recently 1990); this accounts for the other half of the years.

While stocks will likely continue to have more losing years than bonds, interest rates cannot fall materially from their present low levels and are unlikely to fall materially in low-inflation conditions. Thus bonds will tend to outperform stocks only half so often in future low-inflation years, which makes stocks' longer-term record more indicative of future performance; this is consistent with the drop in bond-return variability or standard deviation in 2002 ~ 2006. The recent 25 years of better bond performance, ie, apply to shorter periods, for which bonds would ordinarily make up more of the portfolio in any case.

ii. Mix of dividends and capital gains in stock returns

Capital gains tend to outweigh dividends by roughly two to one except when markets fall. Firms paying dividends tend to be more senior and somewhat less risky than those that do not, however, so dividend-paying issues tend to weigh more heavily in a portfolio. This suggests roughly equal proportions of dividends and capital gains.

iii. Risk

While having positive real returns in every period in Table B-A, as well as in every decade, stocks are riskier than bonds and T-bills. This is measured by the volatility or standard deviation of their average real rates of return, which Table B-A also shows.¹⁰

Annual comparisons confirm stocks' greater returns and greater risks. Stocks have earned more than bonds in 48 of the last 83 years, as noted, and more than T-bills in 46 of the last 73 years. Nothing is riskless, however: T-bills, which generally earn small but positive real returns, had negative real returns in 16 of the 18 years from 1934 ~ 1951 and in six of the eight years 1970 ~ 1977, which means that the inflation rate exceeded their interest rate in those years.

Risk considerations warrant not only diversifying the stock portfolio (which cuts the exposure to individual companies' and industries' risks though not to the risks of the market overall) but also holding fixed-interest instruments of varying maturities.

Diversification by spreading investment over ranges of assets works because different assets respond differently to events and trends. While bonds and T-bills tend to move somewhat together (correlation + 0.47), stocks and T-bills tend to move weakly together (correlation + 0.05), as do stocks and bonds (correlation + 0.11).¹¹ Good investment practice, as noted, also diversifies holdings of individual stocks and bonds.

iv. Maturity of fixed-interest assets

Fund managers usually choose a mix of fixed-interest maturities. Shorter-term fixed-interest obligations, like 91-day T-bills, tend to yield less than long-term bonds because they are less exposed to the risks of changes in interest rates — except in the years around 1980.

The unanticipated rise in interest rates in the years from 1977 to 1981 shifted the advantage to T-bills, but then the drop in interest rates in 1982 gave a 30.9% real return to bonds that year but just 5.5% for T-bills. Interest-rate risk premiums above the normal real rate of return and current inflation persisted long after annual changes had moderated.

Diversifying the maturity of fixed-interest securities reduces the overall or portfolio exposure to such shifts and swings. It thus places expected fixed-interest returns between the bond and T-bill rates.

v. ***Taxes***

The tax system, by treating capital gains and stock dividends more lightly than interest (which is fully taxed), increases the advantage of holding a substantial portion of the fund in stocks. Stocks, though, differ not only as to their risks and overall returns but also as to the likely split between dividends and capital gains.

Excluding a half of capital gains (permitting that portion to be received tax-free), recognizes that mere inflation accounts for much of the nominal gains.

The recently-enhanced dividend tax credit, relieving shareholders of public companies from the double taxation of corporate profits, reduces the effective federal and provincial tax rate on dividends received by approximately 33%, so that a taxpayer in the lowest brackets receives dividends virtually tax-free. Thus dividends tend to yield higher after-tax returns than capital gains do, while a dollar in either form results in higher after-tax income than a dollar of interest does.

vi. ***The resulting mix of assets and of incomes***

The review of investment performance not only suggests a mixture of assets but also distinguishes the asset mix from the income mix. The BC Supreme Court adopted an asset mix of two-thirds “risk-free” fixed-interest securities and one-third in shares of “sound Canadian corporations” in *Morrison* and *Harrison*, and a split of one-half each in *Kwok*.¹² The even split in *Kwok* more closely resembles the conservative, balanced portfolios of foundations and pension funds as well as the holdings of balanced mutual funds.

The history of average real yields on TSE stocks, long-term Government of Canada bonds, and 91-day treasury bills suggests that stocks will tend not only to outperform fixed-interest bonds and T-bills, albeit with greater volatility, but also to earn twice as much on average. Both professional management and the limited scope for further bond gains due to interest-rate declines like those of the 1980s and 1990s make this likely. Thus the asset mix for a fund to last beyond a decade or two (approaching a half in stocks) would tend to derive approximately two-thirds of its income from stocks (as dividends or capital gains) and one-third as interest.¹³

Since more senior corporations tend to pay higher dividends than average, as noted in §B.3.iii above, it is reasonable to assume a stock-investment policy that results in half the average stock income as dividends and half as capital gains. The overall *income* mix resulting from a likely asset mix for a long-term fund would then average one-third each as interest, dividends, and capital gains.¹⁴

vii. ***The resulting portfolio return***

To attain the expected 3½% real annual rate of return requires holding equities, which in turn requires professional management, typically including custody and discretionary investment. Professionally-managed, balanced funds tend to earn more than the 3½%; thus the grossup allowance for such management is discounted by 40% so that the defendant does not pay for the plaintiff’s superior investment returns [*Bystedt v. Hay*, 2007 BCCA 84, §19]. That professional management also allows the tax-efficient income mix (two-thirds tax-favoured dividends and capital gains, one third interest) assumed above. A more traditional income mix— half interest, half dividends and capital gains — tends to double the tax-grossup allowance required.

B.4 Technical notes on tax grossups

¹ **(Non)taxability of award principal** — Revenue Canada, Interpretation Bulletin IT-365R2, May 8, 1987, ¶2, exempts an individual's awards for personal injury, including awards for otherwise-taxable lost wages.

² **Taxability of investment earnings** — Investment income or returns on the invested proceeds are taxable as part of personal income unless the award compensates for a young plaintiff's own injury and the investment income is earned before his or her 21st birthday, in which case *Income Tax Act* exempts the investment income [*Income Tax Act*, §81(1)(g.1) and (g.2)]. This applies only to the years before his or her 21st birthday.

³ **Taxing the expected returns** — Future losses are discounted at the standard rate of return on investment, and taxing that return would reduce the actual return by removing part of the income needed over the person's lifetime. That would exhaust the fund prematurely.

To put it another way, the award is a present value that discounts future needs or losses by the time value of money, which equals the standard rate of return on investment after allowing for price inflation. A higher rate of return means a lower present value because you need to invest less today for it to grow to the future amount; a lower rate of return means a higher present value.

Having, say, \$1,000 a year from today requires investing \$943 today at 6% per year ($= 1000 / 1.06$), \$966 at 3½% ($= 1000 / 1.035$), and \$980 at 2% ($= 1000 / 1.02$). If you expect \$1,000 after a year of returns at 3½% but taxes reduce that yield to 2%, you get only \$986 ($= 966 \times 1.02$). Especially over a lifetime, that shortfall would leave needs and losses unmet.

The grossup allowance added to today's award is the amount needed to offset that shortfall. In this one-year example, that is the \$14 shortfall of the actual \$986 from the expected \$1,000 ($= (\$966 + \$14) \times 1.02$). The calculation over a lifetime is more complex, but the principle remains: add just enough at the outset to realize the award's expected annual payments even after taxes.

⁴ **Real and nominal rates of return** — The actual nominal rate $= (1 + \text{real } 0.035) \times (1 + \text{inflation rate}) - 1$. At moderate inflation rates, the approximation of adding the two rates holds: $(1.0350) \times (1.0250) - 1 = .0609 \approx 6\%$ per year.

⁵ **Statistics used** — This draws its statistical history as to rates of inflation, interest, return, capital gains, and dividends from the 2007 *Report on Canadian Economic Statistics, 1924 ~ 2006* [Canadian Institute of Actuaries, Ottawa: 2007, and prior annual issues, cited as *CIA Report*]. That Institute has compiled the statistics and produced its *Report* since 1977. The *Report's* signal advantages are its consistent, 83-year historical series, the expertise with which they are compiled and produced, and the diverse data sources.

The 2008 *Report* adds the very favourable 2007 figures, while the 2009 report with the 2008 results will become available later. The recent volatility — the long upswing through mid-2008 and the subsequent collapse — makes it more representative to omit favourable 2007.

⁶ **Data — inflation rates** — *CIA Report*, Table 2A, Basic variables — changes for various subperiods, and Standard deviations of nominal annual percentage rates of change/return. Current figures come from Statistics Canada via *British Columbia Earnings and Employment Trends* [Victoria: British Columbia Ministry of Finance and Corporate Relations].

⁷ **The implicit projected inflation rate** — The exact projected inflation rate is 2.42%: $(1.0350) \times (1.0242) - 1 = .06 = 6\%$.

⁸ **Returns, risks, and the investment mix** — I regret invoking the ghost of times before §51 of the *Law and Equity Act* permitted the fixing of discount rates, but this appears necessary in order to project the likely tax treatment of the income at the prescribed 3½% real rate of return: that treatment depends upon the total income (including the inflated rate of return) as well as on the mix of interest, dividends, and capital gains.

- ⁹ **Real rates of return** — *CIA Report*, Table 2B, Average real annual percentage rates of change/return, yields the stock, bond, and T-bill returns. The annual stock and bond rates for each year — including reinvested dividends, coupons, and payments as well as capital gains and losses — are calculated as though the assets were purchased at the start of each year and sold December 31st. 91-day treasury or T-bills would be rolled over until the final maturity on December 31st rather than sold. Thus bond returns may include capital gains or losses (from interest-rate changes), though gains would tend to balance losses over several years. The common shares considered are those listed on the S&P/TSX index of the Toronto Stock Exchange [*Ibid*, Appendix C], making them the most senior, least risky issues on the senior, least risky Canadian exchange. The bonds are Canada long bonds. Table 8 provides nominal returns on pension funds, which I converted to real rates for comparison.
- ¹⁰ **Volatility or risk by kind of asset** — *CIA Report*, Table 2B, Standard deviations of real annual percentage rates of change/return.
- ¹¹ **Tendencies to vary together or oppositely** — Figures come from *CIA Report*, Table 2B, Correlations of real annual percentage rates of change/return, all years. Tending to go up together and down together (same direction and amount) is called *positive correlation* (coefficient > 0), always moving together by the same percentages is *perfect correlation* (coefficient 1.00), two items that move entirely independently are called *uncorrelated* (coefficient = 0), and tending to move oppositely is called *negative correlation* (coefficient < 0). Including negatively-correlated assets in a portfolio would reduce the overall portfolio risk, though perhaps at the cost of reducing average returns as well.
- ¹² **Cases** — *Morrison v. Hicks et al.* [51 BCLR (2d) 203 (BCSC), 1990] and *Harrison v. Biggs et al.* [January 31, 1991, Vancouver C884654 (BCSC)], are cited in A. Strang, “The ‘Grossing-Up’ of Personal Injury Awards: Recent Developments” [*The Advocate* vol. 49 part 6, November 1991, pp. 879-885]. *Kwok [and Kwok] v. BC Ferry Corp.* is reported at [20 BCLR (2d) 364 (BCSC), 1988]. A CanLII search finds no more recent case.
- ¹³ **Time horizon and asset mix** — This holds except for the shortest periods or lifetimes — a few years rather than decades — for which greater safety in the few years outweighs higher returns in most years over the longer term. The appropriate stock or equity portion, that is, like the appropriate time to maturity of fixed-interest securities, tends to decrease for short periods or remaining lifetimes.
- ¹⁴ **Income mix, income taxes, and tax grossup allowance** — The foregoing analysis distinguishes the income mix from the underlying asset mix. An asset mix with half as fixed-interest securities does not imply an income mix with half as interest. Equity rates of return exceed fixed-interest rates of return, as noted, and even holding fixed-interest securities can give rise to gains and losses. Thus for any portfolio including both fixed-interest securities and equities, the equity component will tend to return a disproportionate share of the total income. Pension fund results confirm this as well.

The assumed income mix is tax-efficient, taking advantage of the favourable tax treatment accorded dividends and capital gains, and resulting in relatively low estimated taxes and grossup allowances. I have consistently employed this conservative approach, which seems to fit the data, on behalf of plaintiff and defendant since 1990.

Assuming that more of the income arrives as interest and less as dividends and capital gains, say half as interest and a quarter each as dividends and capital gains, would increase the estimated taxes and required allowance. A mix of $\frac{1}{2}$, $\frac{1}{4}$, and $\frac{1}{4}$ would raise the allowance by approximately a half; if almost all the care outlays qualified for the medical-expense credit, the allowance would double. The assumed income mix thus appears to obviate any need to apply the “survival approach” to weighting future years.

Should the person’s age or other circumstances indicate another income mix, though, I could readily estimate the resulting allowance.