

The effect of changes in each parameter on Z can be noted.⁷ The relative advantage of a "personal-pension" deduction becomes more attractive as the ratio of current-year marginal tax rate to expected withdrawal-year marginal tax rate (i.e., r/t) increases.⁸ Note that tax option B still will give a greater net final fund even when the respective rates are equal ($r=t$), because of the tax shelter.⁹

The net yield advantage of the personal pension deduction can be quite attractive to a taxpayer with a high current marginal tax rate, if this were the only preferential tax treatment option. This can be illustrated for arbitrary values $q=0.3$ and $i=0.06$.

The essential point is that a taxpayer is not restricted to these two income-tax alternatives; there are other attractive options to increase net (aftertax) yields. Capital gains is a familiar alternative. In capital gains as in the standard approach, an individual establishing a retirement-saving fund first must pay income taxes on current earnings before investment. If the interim earnings on principal are not "realized" for tax purposes until retirement, these sheltered earnings will be subject to a capital gains marginal tax rate, assumed to be $0.5t$ at withdrawal.¹⁰

Using the same illustrative parameters as in the first two tax options, our taxpayer will realize a \$1,409 net final fund, or an effective net (aftertax) yield of 4.29 percent. The net final fund under capital gains option C is calculated as the original net investment and accumulated earnings, minus the capital gains marginal tax rate on earnings at the time of ultimate withdrawal.

$$C = R(1-r) (1+i)^m - \frac{t}{2} [R(1-r) (1+i)^m - R(1-r)]$$

$$= R(1-r) (1+i)^m \left(1 - \frac{t}{2}\right) + \frac{t}{2} R(1-r)$$

$$Z' = \frac{B}{C} = \left[\frac{1-t}{1-r} \right] \left\{ \frac{1}{1 - \frac{t}{2} \left[1 + \frac{1}{(1+i)^m} \right]} \right\}.$$

The "personal pension" deduction (option B) now is compared with other available tax options (e.g., capital gains option C). The relative effective net yield advantage of the "personal pension" deduction is reduced by over 40 percent in the illustrative example. However, one cannot state categorically that the relative effective net yield

⁷ $\frac{dZ}{di} > 0$, $\frac{dZ}{dm} > 0$, $\frac{dZ}{dq} < 0$; $0 \leq i, q, r, t \leq 1$.

⁸ Specific values of the marginal tax rates also are significant in addition to the absolute differences. Thus the advantage is greater when $(t, r) = (0.2, 0.5)$ than when $(t, r) = (0.1, 0.4)$. The advantages of preferential tax treatment is a function of the level of potential tax liabilities.

⁹ Assume $q=0.3$, $i=0.06$. If marginal tax rates in the contribution year and payoff year are equal, the payoff advantage of B over A is

M Earning years	$Z=B$ A
10	1.18
20	1.40
30	1.66

¹⁰ This is an oversimplification of capital gains rates, but will serve for illustration.