

Present Value

$$PV = \frac{C}{(r-g)} \left[1 - \left(\frac{1+g}{1+r} \right)^t \right]$$

Example

M is 30 and salary next year \$40,000. M forecasts salary will increase by 5% per year until age 60 a) If the discount rate is 8 percent, what is the PV of these future salary payments? $PV = 40,000 / (.08 - 0.05) \left(1 - \left(\frac{1 + 0.05}{1 + 0.08} \right)^{30} \right) = 76,662.5$ b) If M saves 5 percent each year and invests at 8%, saving by age 60? $PV(\text{salary}) \times 0.05 = \$38,033.13$ Future value = $\$38,033.13 \times (1.08)^{30} = \$382,714.30$ c) M plans to spend in even amounts over the 20 y, how much spend each year? $382,714.30 = C / .08 \left(1 - (1 / 1 + .08)^{20} \right) \Rightarrow c = 38,980.73$.

C

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