Lesson 7-5 – Compound Interest – Perpetuities

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3. Perpetual Payments

- Series with perpetual payments are called ‘perpetual annuities’ or ‘perpetuities’.
- We only consider the present value of perpetual annuities (the future value is ∞).

$$\text{Ordinary}: \; P = \frac{A}{i}$$

$$\text{Due}: \; P = \frac{A}{i}(1+i) = \frac{A}{i} + A$$

$$\text{Geometric Growth}: \; P = \frac{A}{i-g} \qquad \text{Note}: \; i > g$$

Perpetual Annuities Example

- A family wants to establish a scholarship in their name at a university. They want $2500 to be awarded annually, starting next year. The scholarship fund has an interest rate of 6.25% compounded annually. Determine the size of the endowment the family must give.

- $P = A/i = \$2500/0.0625 = \$40,000$

Perpetual Annuities Example

- What if the family wanted the scholarship to start immediately, i.e. this year?
- Perpetual Annuity Due
- P = A/i * (1+i) or A/i + A
- P = $2500/0.0625 + 2500 = $42,500