## Only one formula to memorize!

Growing Annuity formula encompasses all of the other formulas in this section:

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

## Growing cash-flows Type of cash-flows Constant cash-flows g = 0; $n \to \infty$ $g < r; n \rightarrow \infty$ **Perpetuities** $PV(Perpetuity) = \frac{c}{\pi}$ $PV(Growing\ Perpetuity) = \frac{C}{r-a}$ (last forever) $g < r ; n \rightarrow N$ g=0; $n \to N$ **Annuities** $\left| PV(Annuity) = \frac{C}{r} * \left[ 1 - \frac{1}{(1+r)^N} \right] \right| PV(Growing \ Annuity) = \frac{C}{r-g} * \left[ 1 - \left( \frac{1+g}{1+r} \right)^N \right]$ (N periods)

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Fahmi Ben Abdelkader © Financial Economics - Time Value of Money

**Applying The Rules of Time Travel** 

Compounding Laws and Effective Annual Rate

Valuing a stream of cash flows

Perpetuities, Annuities, and Other Special Cases

## Solving for Variables Other Than Present Values or Future Values

First step: what is the missing value?

Present Value

Future Value

Cash Flow (Payment)

Internal Rate of return

N periods

Second step: Timeline

Third step: what kind of stream of cash flows (Annuity, Perpetuity, etc.)?

Fourth step: what is the appropriate formula?



Growing Annuity formula encompasses all of the other formulas in this section:

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