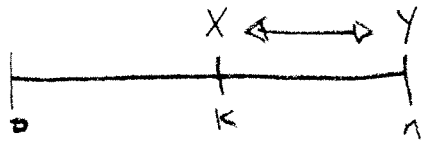
Section 5: Summary



$Y = X \frac{a(n)}{a(k)}$

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Accumulation Functions:

Interest Scenario	Accumulation Function
i – simple interest	$a(t) = 1 + it$, t measured in years
i – periodic eir	$a(t) = (1+i)^t$, t measured in periods
d – simple discount	$a(t) = (1-dt)^{-1}$, t measured in years
d – periodic edr	$a(t) = (1-d)^{-t}$, t measured in periods
δ_t – general force of interest	$a(t) = e^{\int_0^t \delta_r \, dr}$, t measured in years

Constant Force of Interest Special Case: (Continuous Compounding)

$$\delta_t = \delta \Longrightarrow a(t) = e^{\delta t}$$

General Force of Interest Special Case:

$$\delta_t = c \cdot \frac{f'(t)}{f(t)} \Longrightarrow a(t) = \left(\frac{f(t)}{f(0)}\right)^c$$

Periodic Effective Interest and Discount Rates: (eir's and edr's)

$$i_k = \frac{a(k) - a(k-1)}{a(k-1)} \qquad d_k = \frac{a(k) - a(k-1)}{a(k)}$$

When compounding,

$$i_k = i = \frac{i^{(m)}}{m} \qquad d_k = d = \frac{d^{(m)}}{m}$$

$$\text{periodic accumulation factor} = 1 + i = (1-d)^{-1}$$

$$\text{periodic discount factor} = v = 1 - d = (1+i)^{-1}$$

Annual Compounding Case: (i = aeir and d = aedr and $\delta_t = \delta$)

$$v = 1 - d = (1+i)^{-1} = e^{-\delta}$$