

22.2 Indefinitely Repeated Games 1

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8:54 PM

Time value of money

r = interest rate

$$\$1 \rightarrow (1+r)1 \rightarrow (1+r)^2$$

$$\underset{\substack{\uparrow \\ \text{now}}}{V_0} = \underset{\substack{\uparrow \\ \text{future}}}{V_t} (1+r)^t$$

$$V_t = V_0 / (1+r)^t \quad \delta = 1/(1+r) = \text{discount factor} < 1$$

$$V_0 = V_t \delta^t$$

f = Prob game ends after each round

$$t=0 = \text{now} \quad \delta^0 = 1 \quad \delta = 1-f / 1+r$$

$$V_0 = V_{10} [(1-f)^{10} / (1+r)^{10}] = V_{10} \delta^{10}$$

0	1	2	3	4
5	-2	3	-4	12

$$ENPV = 5 + \frac{1-f}{1+r}(-2) + \frac{(1-f)^2}{(1+r)^2} + \dots = EPV$$

Stage games and trigger strategies

$$NPV = v + \delta v + \delta^2 v + \dots = v(1 + \delta + \delta^2 + \dots) = v \sum_{t=0}^{\infty} \delta^t$$