

DAY'S SUBJECT Expected Utility Theory II DATE 1/19/17

+ Petersburg Paradox: let K be the flip where coin is H for the 1st time.

$$K=1 \quad \text{Payoff} = 2 = 2^1$$

$$K=2 \quad = 4 = 2 \cdot 2 = 2^2$$

$$K=3 \quad = 8 = 2 \cdot 2 \cdot 2 = 2^3$$

$$K=4 \quad = 16 = 2 \cdot 2 \cdot 2 \cdot 2 = 2^4$$

$$\Rightarrow \text{Payoff} = 2^K$$

$$\underbrace{\left(\frac{1}{2}\right)\left(\frac{1}{2}\right)\left(\frac{1}{2}\right)\left(\frac{1}{2}\right)\left(\frac{1}{2}\right)}_{K-1}$$

$$K-1$$

$$P(K \text{ is the 1st H}) = \left(\frac{1}{2}\right)^K = \frac{1^K}{2^K} = \frac{1}{2^K}$$

$$EV = \infty$$

$$\sum_{K=1}^{\infty} \frac{1}{2^K} \cdot 2^K$$

$$= \infty$$

$$\sum_{K=1}^{\infty} 1$$

Read the Notes!

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