

PSET

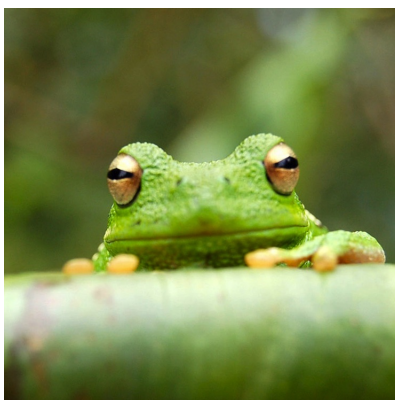
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September 28, 2014

1a)

xxx

1b)



$$\begin{aligned} E\{U(C_t, C_{t+1}, \dots) | \mathcal{F}\} &= E\left\{\sum_{j=0}^{\infty} \beta^j U(C_{t+j}) | \mathcal{F}\right\} \\ &= E\left\{U(e_t - \xi_t P_t) + \sum_{j=1}^{\infty} \beta^j U(e_{t+j} + \xi' x_{t+j}) | \mathcal{F}\right\} \end{aligned}$$

$$\frac{\partial E(U)}{\partial \xi} = E\left\{-P_t U'(C_t) + \sum_{j=1}^{\infty} \beta^j U'(C_{t+j}) \cdot X_{t+j} | \mathcal{F}\right\}$$

Setting $\frac{\partial E(U)}{\partial \xi}$ to 0 (local maximum),

$$E[P_t U'(C_t)] = E\left\{\sum_{j=1}^{\infty} \beta^j U'(C_{t+j}) \cdot X_{t+j} | \mathcal{F}\right\}$$

$$P_t = E\left\{\sum_{j=1}^{\infty} \beta^j \frac{U'(C_{t+j})}{U'(C_t)} X_{t+j} | \mathcal{F}\right\}$$