April 26

Tuesday, April 26, 2016 9:00 AM

$$\beta \lambda_{t+1}^{-\gamma} C_{t+1} = \beta \lambda_{t+1}^{1-\gamma}$$

$$\|$$

$$\lambda_{t+1} C_t$$

(*) $V(\lambda_t) = E_t\left[\beta \lambda_{t+1}^{1-\gamma}\left(1 + V(\lambda_{t+1})\right)\right]$

$P_t = V(\lambda_t) C_t$ — price of a claim on $\{C_{t+j}\}_{j=1}^{\infty}$

price of a claim on

- C_{t+1} only $\quad V_1(\lambda_t) C_t$
- C_{t+1}, C_{t+2}, only $\quad V_2(\lambda_t) C_t$
- $C_{t+1}, C_{t+2}, C_{t+3}$ $\quad V_3(\lambda_t) C_t$

$$V_1(\lambda_t) = E_t\left[\beta \lambda_{t+1}^{1-\gamma}\right]$$

$$V_2(\lambda_t) = E_t\left[\beta \lambda_{t+1}^{1-\gamma}\left(1 + V_1(\lambda_{t+1})\right)\right]$$

$$V_3(\lambda_t) = E_t\left[\beta \lambda_{t+1}^{1-\gamma}\left(1 + V_2(\lambda_{t+1})\right)\right]$$

$\vdots$

$\vdots$

$$V_j(\lambda_t) = E_t\left(\left[\beta \lambda_{t+1}^{1-\gamma}\left[1 + V_{j-1}(\lambda_{t+1})\right]\right]\right)$$

$j \to \infty$

if λ converges ...., it converges to the solution of (*)

$V_j(\lambda_j)\, c_t$

Use this logic ↑ to price a call option on a security.

work backwards

$\boxed{\text{finite horizon option}}$