

Midterm Exam. Econ720. Fall 2013

Professor Lutz Hendricks

- Answer all questions.
 - Write legibly! Write legibly! Write legibly!
 - Write on only one side of each sheet.
 - The total time is 1:15 hours.
 - A good answer should explain what you are doing. For example: "To find the consumption function, I take first order conditions, then use the budget constraint to solve for c ." Then comes the math...
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1 OLG with Arrow-Debreu

Consider the standard OLG production economy with Arrow-Debreu trading.

Demographics: N_t young are born in t . Each lives for 2 periods.

Endowments: Each young has 1 unit of work time. The initial old each have K_0/N_{-1} units of capital.

Preferences: $u(c_t^y) + \beta u(c_{t+1}^o)$.

Technology: $F(K_t, L_t) + (1 - \delta)K_t = K_{t+1} + N_t c_t^y + N_{t-1} c_t^o$.

Markets:

- Trading takes place in $t = 0$.
- Goods are traded at price p_t . Capital is rented at rate q_t (in units of account). Labor is rented at rate w_t (in units of account).

Questions:

1. Explain why the following is the correct budget constraint:

$$w_t + q_{t+1}s_{t+1} + (1 - \delta)p_{t+1}s_{t+1} = p_t c_t^y + p_{t+1} c_{t+1}^o + p_t s_{t+1} \quad (1)$$

2. Derive the household's first-order conditions.
3. Define a solution to the household problem.
4. What is the real interest rate in this economy?
5. Interpret the condition $p_t = (1 - \delta)p_{t+1} + q_{t+1}$.
6. State the firm's first-order conditions. Watch your units!
7. Define a competitive equilibrium.
8. Why don't we lose an equation due to Walras' law?
9. Where is the numeraire?
10. Define a steady state.
11. Under what condition do the Welfare theorems hold / fail? Recall that the Welfare theorems require $\lim_{t \rightarrow \infty} p_t = 0$.

End of exam.