ECON 8040 – TA Session 1

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University of Georgia

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Today's Session

- ⋆ Course Overview
- ⋆ Recommendations
- ⋆ Homework 1 due Friday, August 25, 11:59 p.m.
  - ⟶ Problem 4, Question 4 (in lecture notes) pushed to HW2

About the TA Sessions

TA Sessions
Each Friday, Correll 116, 9:00 – 10:30 a.m.
Rescheduling / cancellations announced on ELC

- ⋆ Attendance optional
- ⋆ Solutions for graded homework
- ⋆ Give intuition on current assignments
- ⋆ As needed, Matlab tutorials
- ⋆ Slides to be posted to ELC afterward

Office Hours & Contact Information

Martin Gervais
Amos B453
Aug. 17 – Sep. 19
Wednesday, 1:30 – 3:15 p.m.
martin.gervais@uga.edu

Roozbeh Hosseini
Amos B457
Sep. 21 – Dec. 5
Wednesday, 1:30 – 3:15 p.m.
roozbeh@uga.edu

Problem Sets & Exams

- ⋆ Problem Sets (mainly analytical)
- ⋆ Computational Exercises (Matlab)
- ⋆ Midterm Exam, TBD
- ⋆ Final Exam, Thursday, December 7, 3:30–6:30 p.m.

Homework & Exams

- ⋆ Collaboration on problem sets is encouraged, but each student must submit their own work
  - ⟶ Please name who you worked with on each homework submission
  - ⟶ UGA Academic Honesty Policy
  - ⟶ *Keep those jeans high and tight, and follow proto*
- ⋆ Past exams posted in ELC make for good practice questions

- ⋆ This course is challenging!
- ⋆ Students learn at different pace; not understanding every topic is okay!
- ⋆ Talk to your peers, Roozbeh, Martin, or me when you are stuck

Mental Health Resources

- ⋆ Emergency:
  - ⟶ Counseling and Psychiatric Services, 706.542.2273 (24/7 support)
  - ⟶ Other emergency services
- ⋆ Non-Emergency:
  - ⟶ Student Care and Outreach, 706.542.7774 or sco@uga.edu
  - ⟶ Well-being and prevention programs

Software & Coding

- ⋆ Install Matlab (required)
  - ⟼ Free through UGA
  - ⟼ UGA IT installation guide
  - ⟼ Computational exercises require Matlab
  - ⟼ ECON 8050 also requires Matlab
  - ⟼ Matlab coding usually tested on macro preliminary exam
- ⋆ Use LaTeX(optional)
  - ⟼ 30-min. Tutorial
  - ⟼ Online: Overleaf
  - ⟼ PC: MiKTeX
  - ⟼ Mac: BasicTeX
  - ⟼ Visual Studio Code, LaTeX Workshop extension for writing

Reference Materials

- ⋆ Martin's and Roozbeh's lecture notes
- ⋆ Lecture notes by Krueger (Penn), Jones (Minnesota), and others
- ⋆ Textbooks (e.g., Ljungqvist and Sargent; Stokey, Lucas, and Prescott) provide technical background information

Problems 1 & 2

Plot time series of U.S. macroeconomic data

- U.S. Bureau of Economic Analysis (BEA), NIPA tables
- St. Louis Federal Reserve, Economic Data (FRED)

Problem 3

Constant relative risk aversion (CRRA) utility function

a) It may be helpful to write

$$c_t^{1-\sigma} = \exp(\log(c_t^{1-\sigma}))$$

before applying l'Hôspital's Rule

b) Plug derivatives into the provided defintion to write the proof

c) IES is elasticity of consumption with respect to marginal utility, i.e.,

$$\text{IES} \equiv \frac{\%\Delta c}{\%\Delta U'(c)}$$

Problem 3

Constant relative risk aversion (CRRA) utility function

d) Inada conditions
   i. strictly increasing
   ii. strictly concave
   iii. $\lim_{c \to 0} U'(c) = +\infty$
   iv. $\lim_{c \to +\infty} U'(c) = 0$

e) It is equivalent to show marginal rate of substitution for consumption in any two periods is homogenous of degree zero

Problem 3

Constant relative risk aversion (CRRA) utility function

f) $\{\widetilde{c}_t\}_{t=0}^{\infty}$ must be feasible and optimal. A sketch

- $\longmapsto$ Write down maximization problems that $\{\widetilde{c}_t\}_{t=0}^{\infty}$, $\{\widehat{c}_t\}_{t=0}^{\infty}$ solve
- $\longmapsto$ Use necessary FOCs of two households to characterize $\frac{\widetilde{c}_{t+1}}{\widetilde{c}_t}$, $\frac{\widehat{c}_{t+1}}{\widehat{c}_t}$
- $\longmapsto$ Use budget constraints to finish the proof. What do Inada conditions imply about the budget constraints?

Problem 4

First four questions from the lecture notes

1.a) Suppose it is true that $p_t = p$ for all t. Try to solve for consumption and arrive to contradiction.

1.b) Solve ADCE

- $\rightarrow$ Derive Euler equation using household i's first-order conditions
- $\rightarrow$ Write c_t^i in terms of c_0^i using Euler
- $\rightarrow$ Write c_0^i in terms of discount factor, prices, and endowments using budget constraint
- $\rightarrow$ Replace c_0^i in equation you wrote earlier for c_t^i
- $\rightarrow$ Solve p_t using the market-clearing condition
- $\rightarrow$ Solve allocations $\hat{c}_t^1$, $\hat{c}_t^2$ by plugging p_t in expression for c_t^i

1.c,d) Provide intuition

Problem 4

2) Show [AD $\Rightarrow$ SM]
   - $\rightarrowtail$ Derive lifetime budget constraint
   - $\rightarrowtail$ Use $a^i_{t+1} > -\bar{A}$, $r_{t+1} > 0$ to evaluate one limit
   - $\rightarrowtail$ Define $1 + r_{t+1} \equiv \frac{p_t}{p_{t+1}}$
3) Follow sketch provided in the lecture notes
4) Save this one for HW2