TA Session 1

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Econ 8040: Macroeconomics I
August 15, 2025

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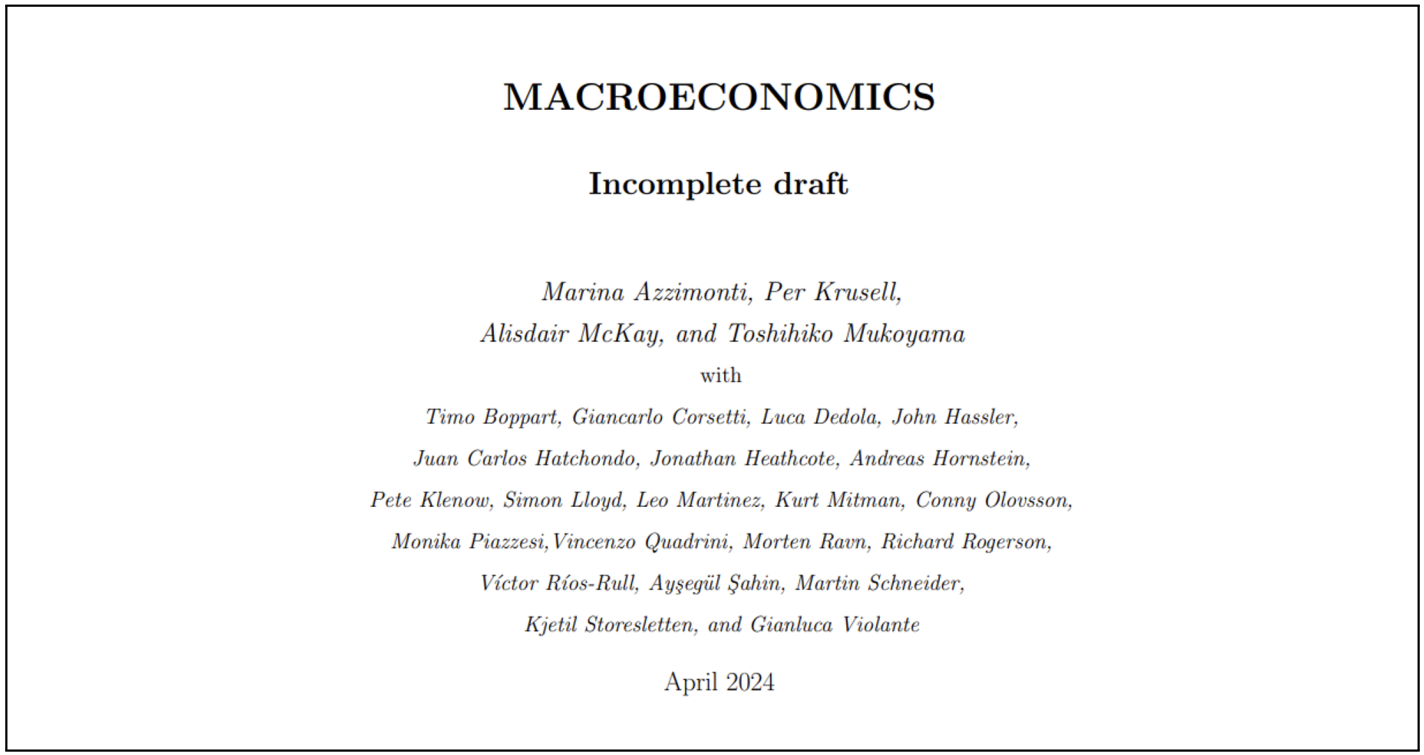
Today's Session

- Welcome to Econ 8040!
- Course Overview and Recommendations
- Problem Set 0 due Friday, August 22, 11:59p.m.

Course Objectives

- Fundamental Techniques of Macroeconomics
  - Modeling an economy
  - Solving equilibrium (analytically and numerically)
  - Analyzing welfare and policy implications
- Topics in Macroeconomic Research
  - Economic growth
  - Fiscal policy
  - Uncertainty and asset pricing
  - Frictional labor market and unemployment

Textbook



MACROECONOMICS

Incomplete draft

Marina Azzimonti, Per Krusell,
Alisdair McKay, and Toshihiko Mukoyama
with
Timo Boppart, Giancarlo Corsetti, Luca Dedola, John Hassler,
Juan Carlos Hatchondo, Jonathan Heathcote, Andreas Hornstein,
Pete Klenow, Simon Lloyd, Leo Martinez, Kurt Mitman, Conny Olovsson,
Monika Piazzesi, Vincenzo Quadrini, Morten Ravn, Richard Rogerson,
Víctor Ríos-Rull, Ayşegül Şahin, Martin Schneider,
Kjetil Storesletten, and Gianluca Violante

April 2024

Macroeconomics

by **Marina Azzimonti**, **Per Krusell**, **Alisdair McKay**, and **Toshihiko Mukoyama** (AKMM) ▸ PDF

Other Reference Materials

- 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

Grading

Category	% Final Grade
Homework	40%
Problem Sets (8)	
Computation Exercises (2)	
Midterm Exam, date TBD	25%
Final Exam, Thursday, Dec. 4, 3:30–6:30p.m.	35%

- Need exam accommodations? ▸ Register w/ DRC

Problem Sets

- Generally, models that can be solved analytically
- Submission is a single PDF file
- Collaboration on problem sets is encouraged, but each student must submit their own work
  - Please name whom you worked with on each homework submission
  - UGA Academic Honesty Policy

Computation Exercises

- Numerical techniques for solving economic models
- Submission is PDF and "replication package"
  - Matlab scripts
  - Any other files (e.g., imported data) required by scripts
  - When grading, I check output of Matlab code against PDF

Exams

- Midterm, date TBD (but likely early- to mid-October)
- Final, Thursday, Dec. 4, 3:30–6:30p.m.
- Exam Preparation Advice
  - Do problem sets well (i.e., don't overrely on classmates' answers as substitutes for your own)
  - Follow lecture material and readings
  - Practice past exam problems (available on eLC)

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

Course Resources

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

Office Hours & Contact Information

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

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TA Session

Each Friday, Correll 113, 9:30–11:00a.m.

Any deviation announced on eLC

- Attendance optional
- Review graded homework
- Give hints on current assignments
- As needed, Matlab tutorials
- Slides to be posted to eLC afterward

UGA Resources

- Disability Resource Center (DRC): https://drc.uga.edu
  - Register with DRC for exam accommodations
- Student Care and Outreach (SCO): https://sco.uga.edu
  - Illness/emergency may result in missing exam or multiple weeks
- Counseling and Psychiatric Services (CAPS): https://caps.uga.edu
  - Counseling at University Health Center (UHC)
  - Referrals to non-UHC Counselors
  - 24/7 crisis support
- Other well-being resources: https://well-being.uga.edu

◂ Grading

Problem Set 0 – General Remarks

- Most problems require data from
  - Bureau of Economic Analysis (BEA)
  - St. Louis Federal Reserve Economic Data (FRED)
  - World Bank's World Development Indicators
  - `PWT_DA_2019.xlsx` file on eLC
- Make *legible* plots using Matlab, R, Stata, or Excel
  - Title
  - Label ***x***- and ***y***-axis
  - Legends when appropriate

Problem Set 0 – Hints

1. National Income Accounting
   - Refer to Roozbeh's "Lecture on National Income Accounting" under **Class Notes** in eLC
2. Plot time series and describe what they show
   - (a), (b), and (c) can all go in one plot
3. De-trend time series and plot trends and their residuals
   - Tired: Line of best fit
   - Inspired: Hodrick-Prescott filter (Matlab)
     - Requires installing **Econometric Toolbox**

Problem Set 0 – Hints

4. Plot FRED data
   - Download plot image directly from FRED website
   - Export data in XLSX, CSV format on FRED website
   - Retrieve data via API using `fredr` R package
5. Cobb-Douglas Production Function
   a) Write necessary conditions for profit maximization
   c) Use result from 5(b), 2(d) to calibrate α
   d) Plug α, K_t, H_t, Y_t into production function to get A_t
6. Plot and discuss trend in health care expenditure as percent of GDP

Problem Set 0 – Hints

7. Decompose cross-country differences in output per worker into
   - differences in *capital per worker*, and
   - differences in *total factor productivity*
8. Select a country and plot GDP shares for three major sectors:
   - Agriculture
   - Manufacturing
   - Services

Problem Set 0 – Hints

9. Model of production economy
   a) Define competitive equilibrium
      - Two types of households maximize preferences
      - Representative firm maximizes profit
      - Markets clear
   b) Solve using optimality conditions, budget constraints, market-clearing conditions, and production function