Lecture 1: Introduction
Course and Macroeconomics

Hui-Jun Chen

The Ohio State University

April 29, 2022

Your Instructor

- My name is Hui-Jun Chen, you can call me HJ for convenience.

- I am interested in housing, used capital market, and their macroeconomics implications.

- In my leisure time, I also like to investigate the Linux system.

- Contact Info:
 - Email: chen.9260@buckeyemail.osu.edu.

  - Website: https://huijunchen9260.github.io

Basics

- Class Meetings: Tuesday and Thursday, 11:40 AM to 1:15 PM

- Zoom Info:
    - Meeting ID: 951 7226 1996

    - Password: 946301

    - Direct Link: https://tinyurl.com/2s4hr365 (Shorten by tinyurl)

- Documents and lecture recordings will be posted on Course Website:
    - Direct Link: https://tinyurl.com/yfpt8nsn

- Announcement, quiz and exams will be made via Carmen
    - Direct Link: https://osu.instructure.com/courses/121985

Basics (Cont.)

- To get email reply, you **must** satisfy two conditions below:
    1. DO **NOT** SEND TO CARMEN EMAIL

    2. Use [E4002.01] at the beginning of your subject title
        – example title: [E4002.01] Question regarding Extra credit

- I will reply your email within *2 business day*.

- Office hour: One hour before the lecture
    - Tuesday and Thursday, 10:40AM - 11:40AM, on Zoom Link

    - Please tell me if you plan on coming!

- Piazza: anonymously asking questions
    - Direct link: https://piazza.com/osu/summer2022/econ400201

    - I will check piazza during office hour

Expectation

- **Attendance**: recommended but not required

- **Participation**: can ask question anytime during the lecture
  - Just interrupt me by asking. Can check zoom chat but might not very often.

- **Prerequisites**: Principle of Economics (ECON 2001 & 2002), Basic Algebra

- **Calculus**: better to know in advance, but will learn via video series The Essence of Calculus
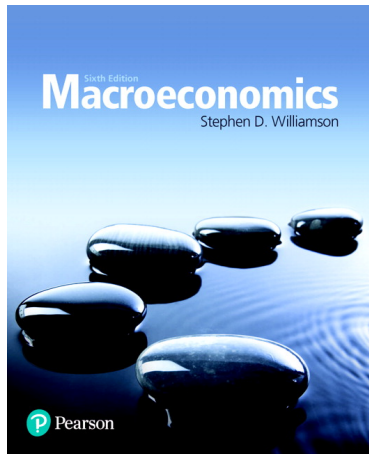
Recommended but not required textbook

Quiz, Exam and Homework

- **Quiz**: Weekly by watching The Essence of Calculus (20%)
    - unlimited time and trials w/ a week, meant to encourage!
    - Will drop 1 lowest quiz between Ch. 1-9.

- **Exam**: Midterm and Cumulative Final, 30% each
    - Midterm: June 23th, 2022
    - Final: August 2nd, 2022

- **Homework**: on Carmen (20%)
    - A good representation for exam
    - step-by-step guidance on calculation

- Schedule and Deadline: see syllabus

Course Plan

- **Module 1**: Measurement (Week 1)
    - stylized facts about Economics growth and business cycle

- **Module 2**: One-period (static) model (Week 2-6)
    - micro foundation: consumers and firms

    - macro implication: equilibrium, efficiency, resource allocation w/ data

- **Module 3**: Two-period (dynamic) model (Week 8-12)
    - module 2 + time: intertemporal substitution

What is Macro?

- "macro is a method"

- Models (theory) + Data (empiric) = explanation to macro events
  - w/o models: only correlation

  - w/o data: only imagination

  - Friedman's critique: models are judged by prediction power

- Macro events in this class: long-run growth and business cycle
  - what drives long-run trend in US GDP?

  - what causes the fluctuation in GDP growth?

- Macro connects with micro
  - individual decisions (micro) ⇒ aggregates (macro)

Data Example: GDP per capita

- **Definition**: Gross Domestic Product per individual
  - quantity produced of goods + services w/i country border at given period of time

- **Measurement**: 3 possible approaches
  - Product, Expenditure, Income

  - Source: National Income and Product Accounts (NIPA)

- **Analysis**: separation data into trend and business cyclie

Real GDP per capita, 1900-2014

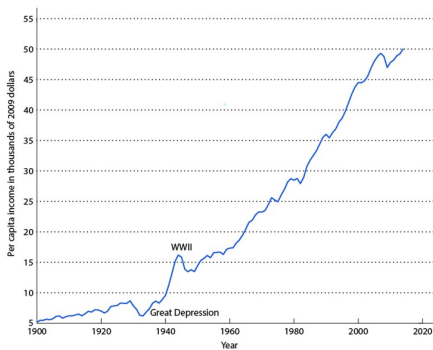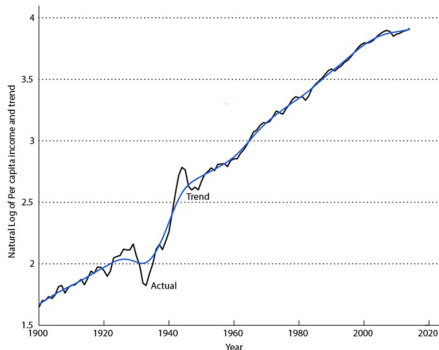Figure 1.1: Per Capita Real GDP (in 2009 dollars) for the United States, 1900–2014
Y

Figure 1.3: Natural log of Per Capita Real GDP and trend, 1900–2014
$y = \ln(Y), trend = HPFilter(y)$

Business Cycle: Deviation from Trend

Figure 1.4 Percentage Deviation from Trend in Per Capita Real GDP
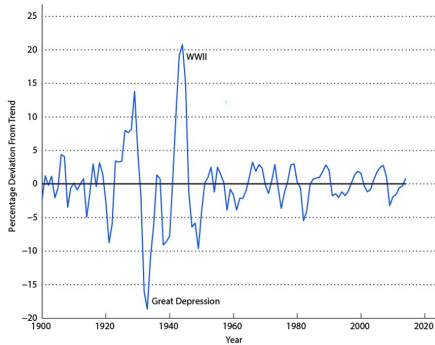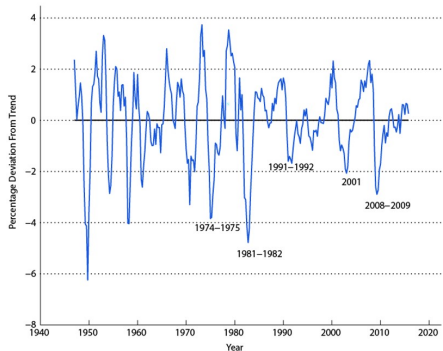actual - trend

Figure 1.13 Percentage Deviation From Trend in Real GDP
same transform as 1.1, 1.3, 1.4, not per capita

Using Macro Model to Understand Data

- Economics is a scientific pursuit involving the formulation and refinement of theories that can help us better understand how economies work and how they can be improved

- **Data**: how economies work, e.g. GDP example

- **Theory**: cannot do experiment, only way for scientific pursuit

- **Policy**: understand how economies can be improved by policies

Structure of Macro Model: 4 elements

1. **agent**: who is involved?
   - e.g. consumers, firms, governments, etc.

2. **preferences**: how and what is consumed/valued/invested?
   - e.g. consumers' utility function on goods

3. **resources**: availability and distribution
   - e.g. Wealth, time, talents, natural resources

4. **technology**: objective limitation at given period of time
   - firms' production, market structure

Analysis on Macro Model: 3 steps

① **Equilibrium**: how do all the forces balanced?
  - e.g. competitive equilibrium

② **Assessment**: what's model prediction, and how different from data?
  - relationship between consumption and output

③ **Refinement**: how do changes in model alter its prediction?
  - different technology, one-period $\rightarrow$ two-period

Just Micro?

Yes! Macro models need micro foundation, because

- aggregate behavior is the sum of individual decisions

- Lucas' critique: structures of economies change w/ policies b/c individual decision changed

- Need to know effect on individual behavior to know the aggregate effect!

- E.g. Two force of COVID stimulus policy:
    1. $\Rightarrow$ workers have less incentive to work $\Rightarrow$ unemployment $\uparrow \Rightarrow$ exacerbate recession

    2. $\Rightarrow$ funding $\uparrow \Rightarrow$ firms have more incentive to hire workers $\Rightarrow$ mitigate recession