Lecture 1: Introduction Course and Macroeconomics

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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.
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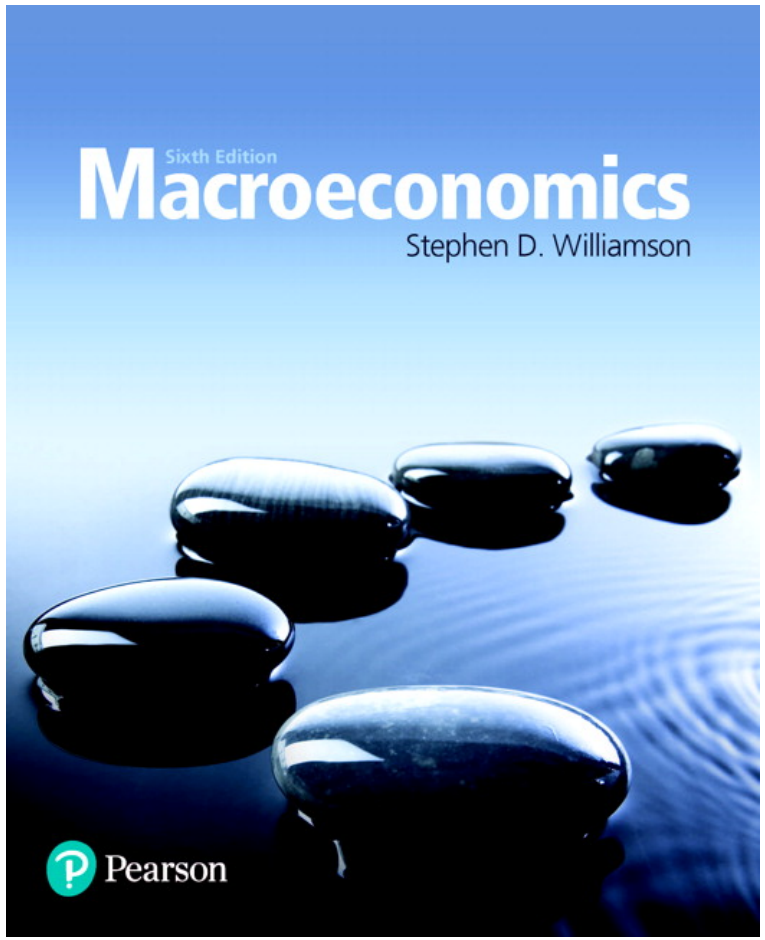
Syllabus

Expectation

- **Participation**: can ask question anytime during the lecture
- **Prerequisites**: Principle of Economics (ECON 2001 & 2002), Basic Algebra, Calculus
- **Calculus**: better to remember in advance, but will learn via video series The Essence of Calculus



Recommended but not required textbook

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
- **Module 4**: TBA

List of Possible Module 4 Content

- Economics Growth: Exogenous Growth Model (Solow Model)
- Labor / Employer Bargain: 1-sided / 2-sided label search model
- Finance: Asset Pricing model
- Coding and algorithm to solve RBC model

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) $\Rightarrow$ 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 cycle

Real GDP per capita, 1900-2014

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

Y

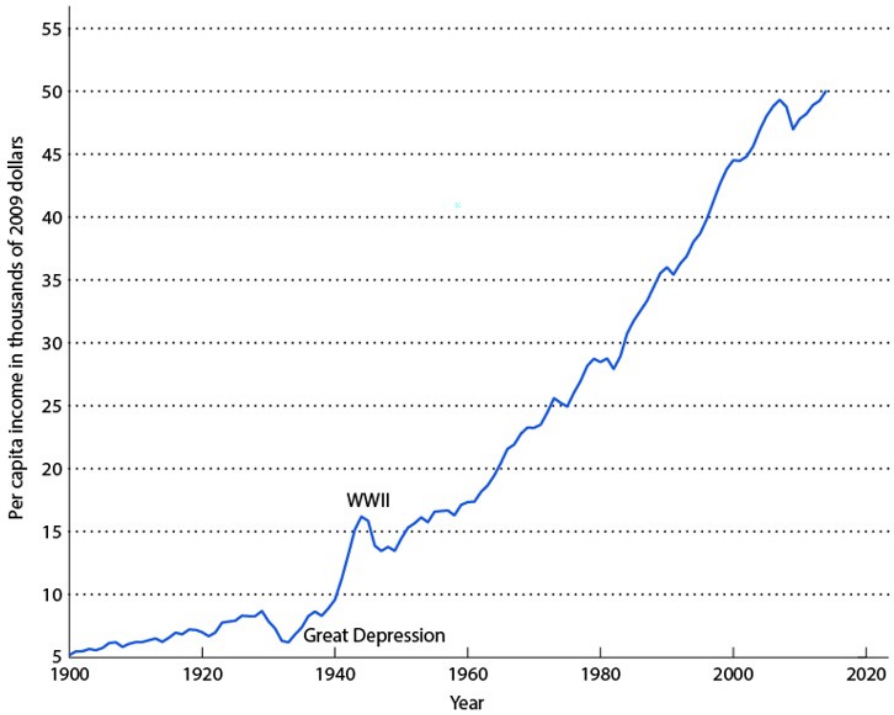
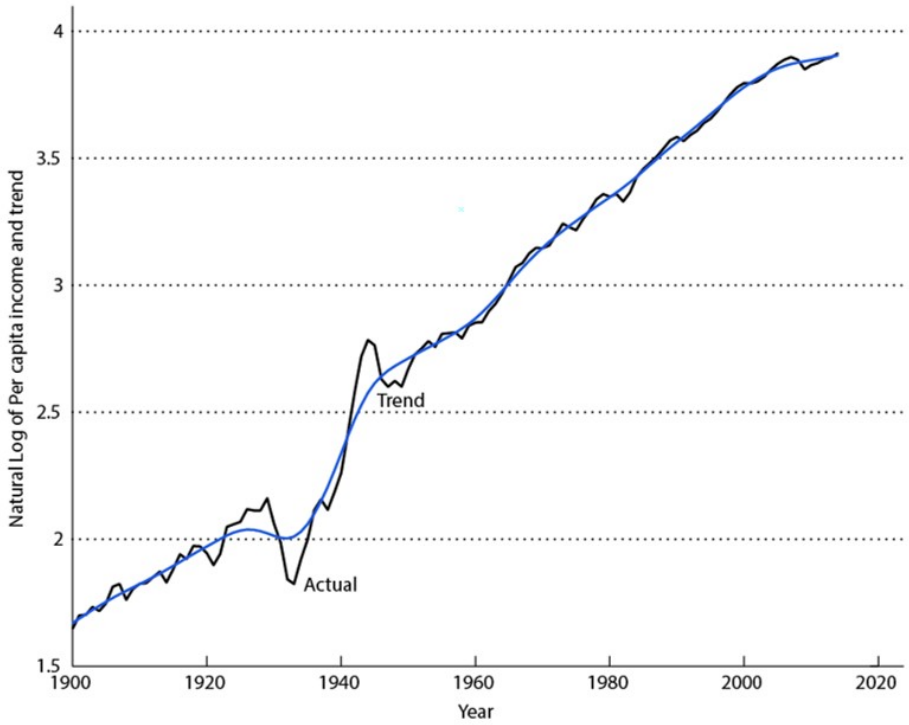


Figure 1.3: Natural log of Per Capita Real GDP and trend, 1900–2014

$y = \ln(Y), trend = HPFilter(y)$



Business Cycle: Deviation from Trend

Figure 1.4 Percentage Deviation from Trend in Per Capita Real GDP

actual - trend

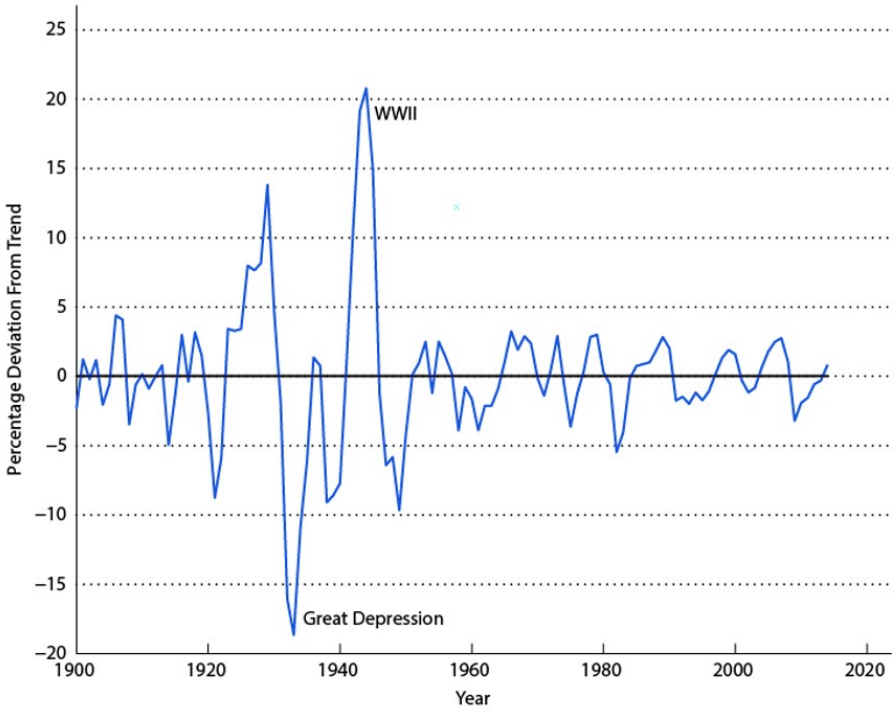
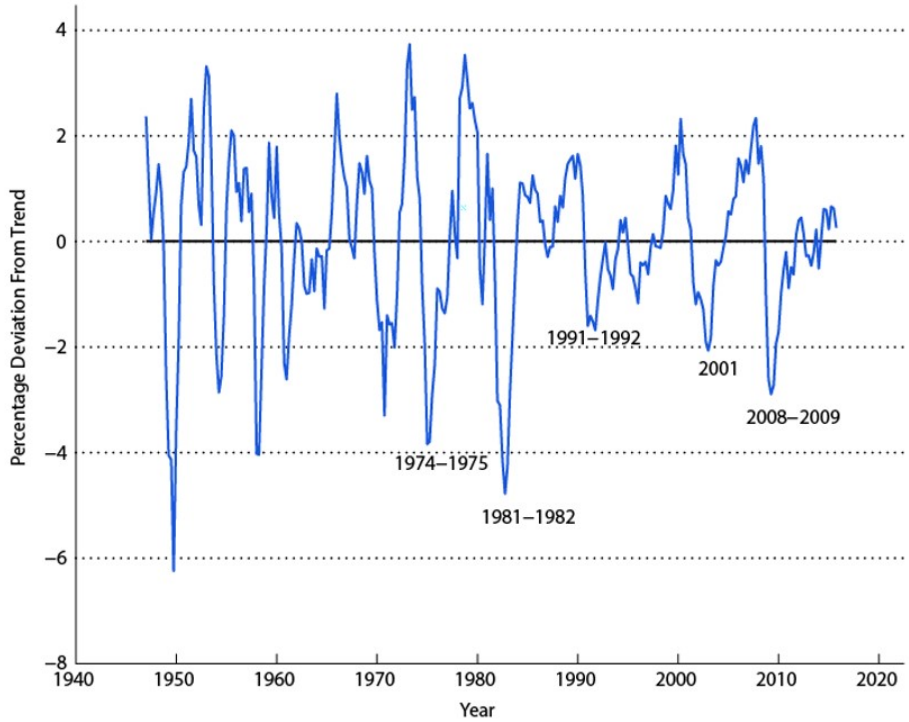


Figure 1.13 Percentage Deviation From Trend in Real GDP

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