Lecture 1: Introduction Course and Macroeconomics

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Outline

Your Instructor

- My name is Hui-Jun Chen, you can call me HJ for convenience.
- I work on Macro-Finance, investigating issues like corporate tax reform, housing, used capital market, and their macroeconomics implications.
- Contact Info:
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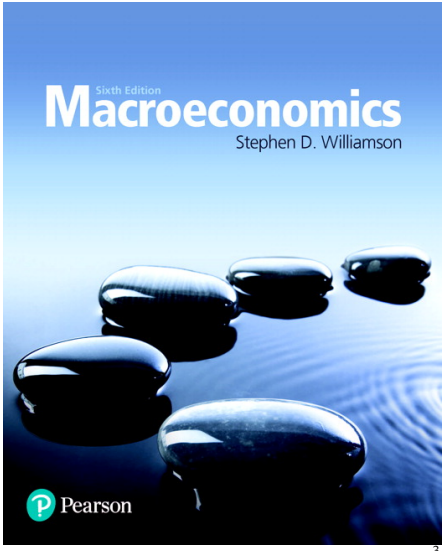
  - Course website: https://huijunchen9260.github.io/MacroeconomicsIAutumn2025.html

Expectation

- **Participation**: can ask question anytime during the lecture
- **Prerequisites**: Principle of Economics, Basic Algebra, Some knowledge of Calculus
- Other rules: please refer to the 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 with data
- **Module 3**: Two-period (dynamic) model (Week 8-12)
  - module 2 + time: intertemporal substitution
- **Module 4**: Dynamic Programming and Asset Pricing

Outline

What is Macro?

- "Macro is a method"
- Models (theory) + Data (empiric) = explanation to macro events
  - without models: only correlation
  - without 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: Figure 1.1: Per Capita Real GDP (in 2009 dollars) for the United States

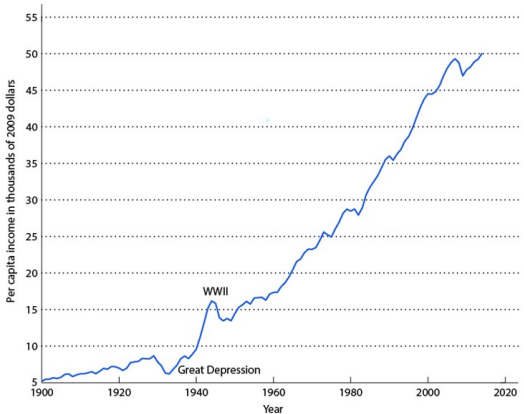
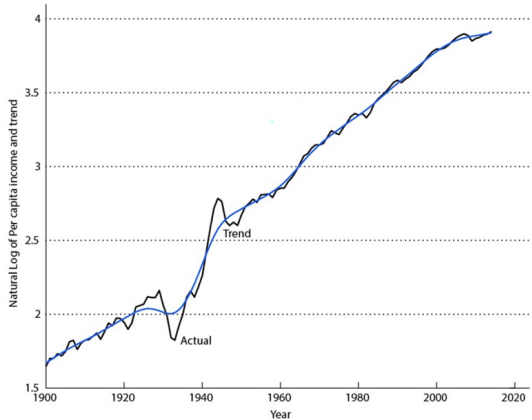


Figure: Figure 1.3: Natural log of Per Capita Real GDP and trend, 1900 – 2014 (Trend: HP Filter)



Business Cycle: Deviation from Trend

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

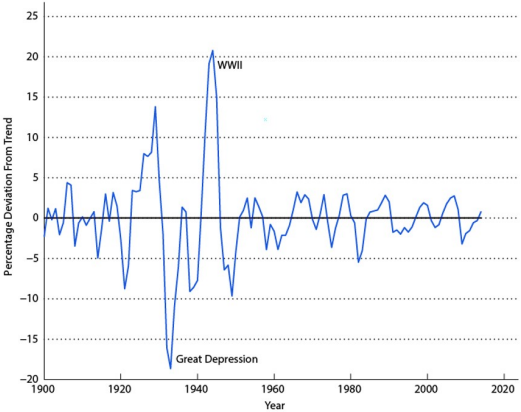
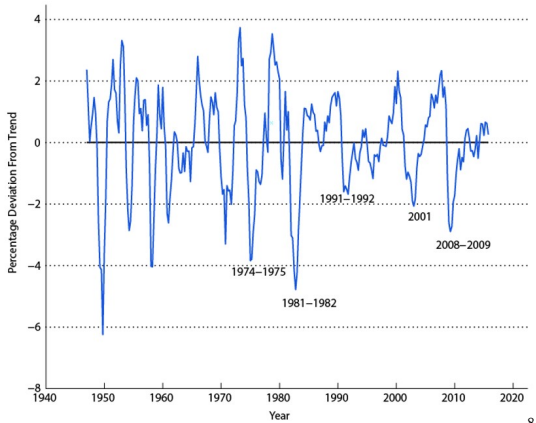


Figure: Figure 1.13 Percentage Deviation From Trend in Real GDP, same transform as 1.1, 1.3, 1.4, not per capita



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 at economy scale $\Rightarrow$ only way for scientific pursuit
- **Policy**: understand how economies can be improved by policies

Anecdotic Illustration of Economics Model

Build your own world (similar to real world) so that you know every detail!

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

What makes a good model?

Friedman's critique: models are judged by prediction power

- Clarity: is the logic and causality understandable?
- Prediction power: match data?
- Communication: what we (dis-)agree about?

ALL models are fake, only some are useful, i.e., elucidates the underlying mechanism that people implicitly follows

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