

Lecture 1: Introduction Course and Macroeconomics

Hui-Jun Chen

National Tsing Hua University

September 2, 2025

Outline

1 Course Plan

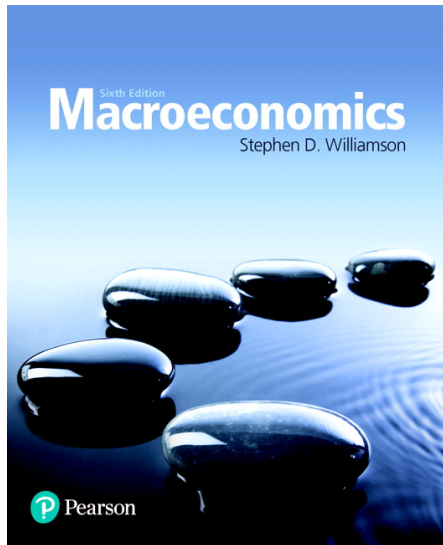
2 Methodology of Macro

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:
 - ›› Email: huijunchen@mx.nthu.edu.tw.
 - ›› Website: <https://huijunchen9260.github.io>
 - ›› 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

1 Course Plan

2 Methodology of Macro

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

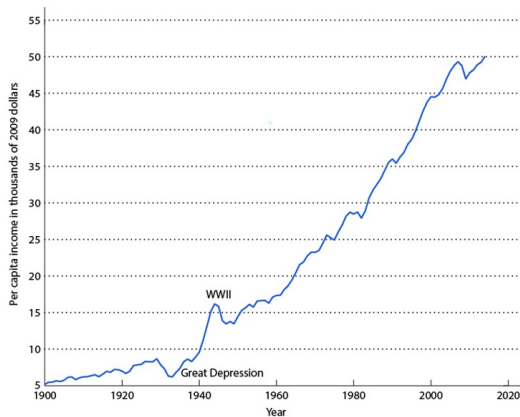
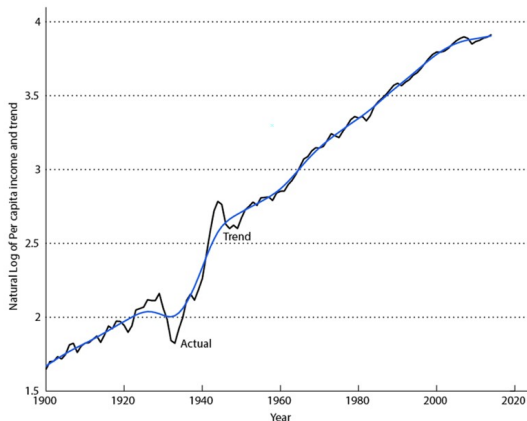


Figure: Figure 1.3: Natural log of Per Capita Real GDP and trend, 1900 – 2014 (Trend: HP Filter)



Business Cycle: Deviation from Trend

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

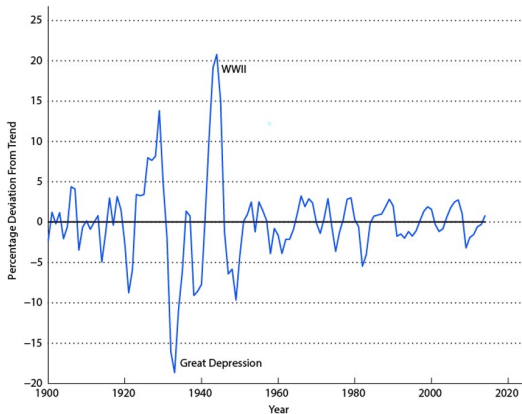
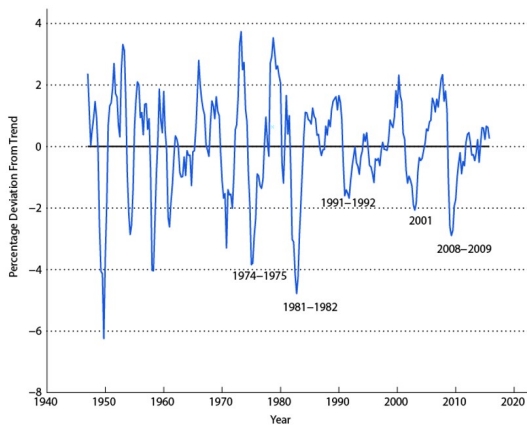


Figure: Figure 1.13 Percentage Deviation From Trend in Real GDP, **same transform as 1.1, 1.3, 1.4, not per capita**



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