Intermediate Macroeconomic Theory
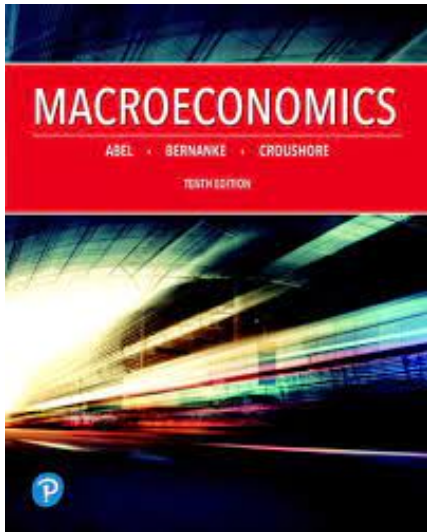
Econ 4002, Washington University in St. Louis

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This Course: Essential Info

- ▶ Econ 4002/5002, Intermediate Macroeconomic Theory

- ▶ Lectures: Mondays and Wednesdays, 4:00-5:20pm, Simon Hall 1

- ▶ 27 lectures, including this one, one review class, and two in-class midterm exams

- ▶ **Assistants in Instruction**: Yudong Rao and Facundo Ulivarri; Steven Chen is the Undergraduate TA

- ▶ **Textbook**: *Macroeconomics, 11th Edition* (Abel, Bernanke & Croushore), Pearson

Textbook: very low resolution pictures of the cover

This Course: Essential Info

▶ **Grading**: 9 homeworks (approximately weekly) $+$ 2 midterms

$$\text{Final grade} = 0.4 \times \text{Homeworks} + 0.6 \times \text{Midterms}$$

- ▶ Homeworks cover roughly one set of lectures
- ▶ Assigned on Wednesdays, due the following Wednesday at 4:00 PM
- ▶ First homework drops on January 21
- ▶ Collaboration allowed, but individual submissions required
- ▶ Lowest HW grade dropped for final grade

▶ **Midterms**

- ▶ Scheduled for March 4 and April 22 (closed-book, calculators only)
- ▶ Location: in-class, 16:00-17:20
- ▶ Let me know at least a week before if you cannot make it

This Course: Essential Info

- **TAs and Office Hours**

  - Yudong Rao (rao.y@wustl.edu)
    Office hours: TBD

  - Facundo Ulivarri (f.n.ulivarri@wustl.edu)
    Office hours: TBD

  - Steven Chen (cminghao@wustl.edu)
    Office hours: TBD

- **Prerequisites**

  - Econ 1502 and Econ 4001

  - I assume you are familiar with basic statistics and differential calculus

  - Level of math in the lectures/homeworks goes beyond that of the book

- All of this info (and more) in the syllabus available on Canvas

Course Plan

1. Measurement (Chs. 1, 2)

2. Theory (Chs. 4, 5, 6, 7) - Midterm 1
   - ▶ Productivity, Output, and Employment
   - ▶ Consumption, Saving, and Investment
   - ▶ Growth
   - ▶ Assets, Money, and Prices

3. Analysis (Chs. 8, 9, 10, 11, 12, 14, 15) - Midterm 2
   - ▶ Business Cycles
   - ▶ A general macro model
   - ▶ Classical analysis
   - ▶ Keynesian analysis
   - ▶ Unemployment and inflation
   - ▶ Monetary policy
   - ▶ Fiscal policy (if we have time)

Learning Objectives

By the end of this course you should (I hope):

1. Have a good grasp of what the main macroeconomic aggregates are and how they are measured

    ▶ i.e., GDP, inflation, government spending, interest rates, labor force participation

2. Understand the meaning of changes in those aggregates

    ▶ i.e., "real GDP grew by an annualized 3% this quarter", "year-on-year inflation was 5.4% last month", "labor force participation fell to an historic low of 61% during the COVID-19 pandemic"

3. Critically evaluate macroeconomic issues using real-world data

4. Apply macroeconomic models to interpret and understand how the economy responds to shocks and policies

    ▶ What are the effects of government stimulus checks on the inflation rate?
    ▶ Does it make sense for the Fed to raise rates right now?
    ▶ What does this imply for output growth?

Learning Objectives

By the end of this course you should be able to understand what is going on in this figure, from a Deutsche Bank market research report that explains why inflation picked up after the COVID-19 pandemic

Figure 1: Present equilibrium is slightly deflationary - the supply curve has shifted and become vertical but the demand curve has shifted more
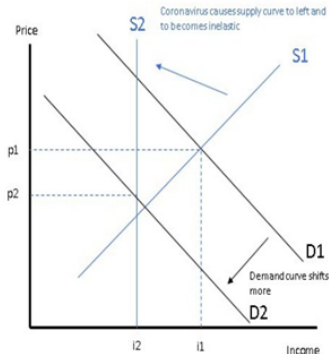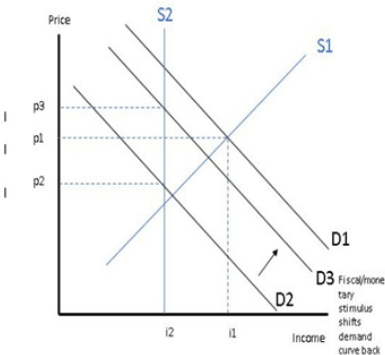
Figure 2: But fiscal and monetary stimulus will shift demand curve back towards pre coronavirus position, pushing up prices

Resources

- ▶ Wall Street Journal, Financial Times, Bloomberg News

- ▶ FRED: `https://fred.stlouisfed.org/`

- ▶ OECD: `https://data.oecd.org/`

- ▶ Eurostat: `https://ec.europa.eu/eurostat`

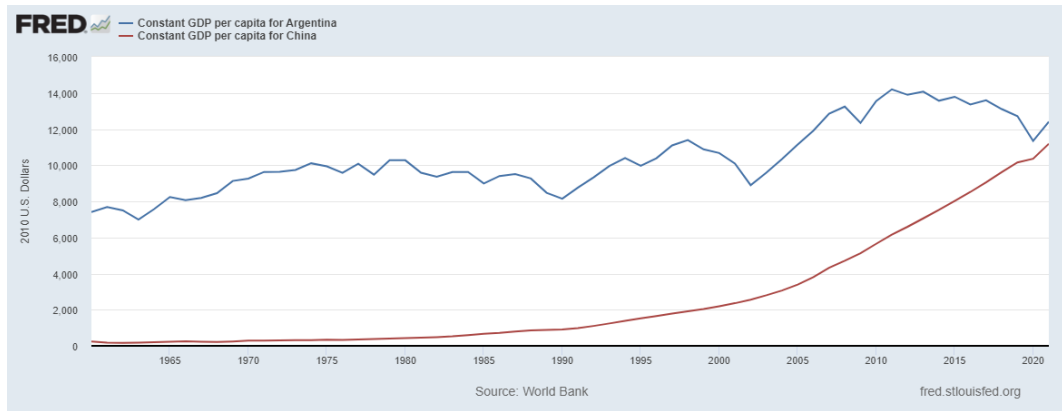- ▶ Penn World Table: `https://www.rug.nl/ggdc/productivity/pwt/?lang=en`

What is Macroeconomics?

$$\text{Economics} \simeq \text{Microeconomics} + \text{Macroeconomics}$$

- ▶ Why $\simeq$ instead of $=$?
  - ▶ Economics includes some fields and areas of study that are hard to classify
  - ▶ Macroeconomics increasingly overlaps with microeconomics
- ▶ Textbook definition: "the study of the structure and performance of national economies and of the policies that governments use to try to affect economic performance"
- ▶ Classical definition: macroeconomics encompasses the study of growth (long-run) and fluctuations (short and medium-run) of aggregate economies
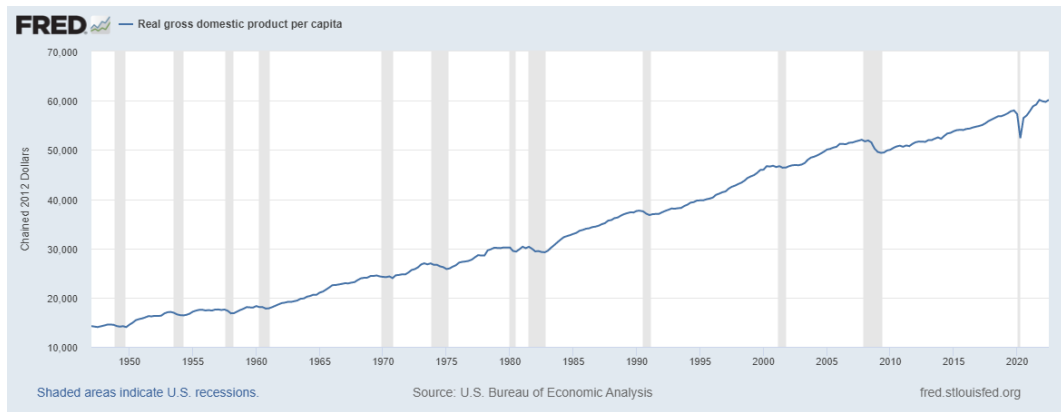- ▶ Easier to define it based on the questions it tries to answer:

Why do some countries grow so fast?

...while others stagnate?

Why do economies experience business cycles?

...and what determines their length and intensity?
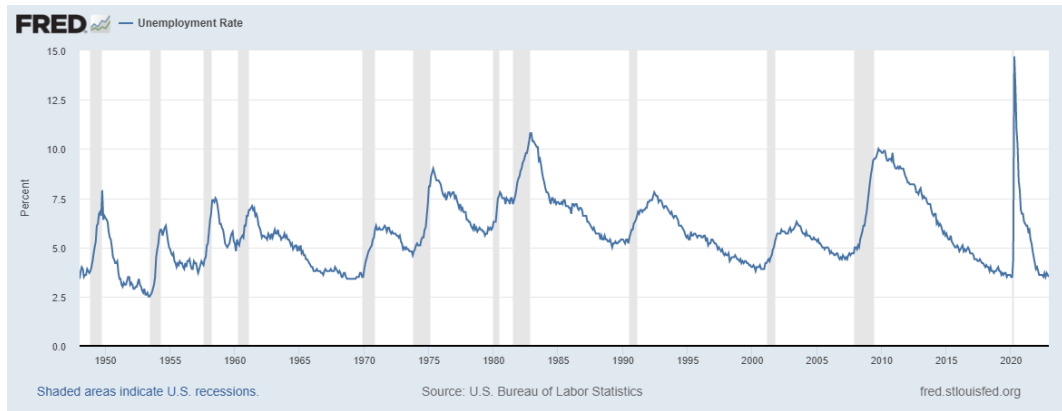
Real gross domestic product per capita

$$y_t = \frac{P_t Y_t}{P_{2012} N_t}$$

where

- ▶ P_t = price level in year t

- ▶ Y_t = real GDP in year t

- ▶ $P_t \times Y_t$ = nominal GDP in year t

- ▶ P_{2012} = price level in 2012

- ▶ N_t = population in year t

- ▶ Measure of domestic production per person that is comparable over time, as it adjusts for changes in the price level.

Why are there unemployed people?

...even during expansions?

Unemployment Rate

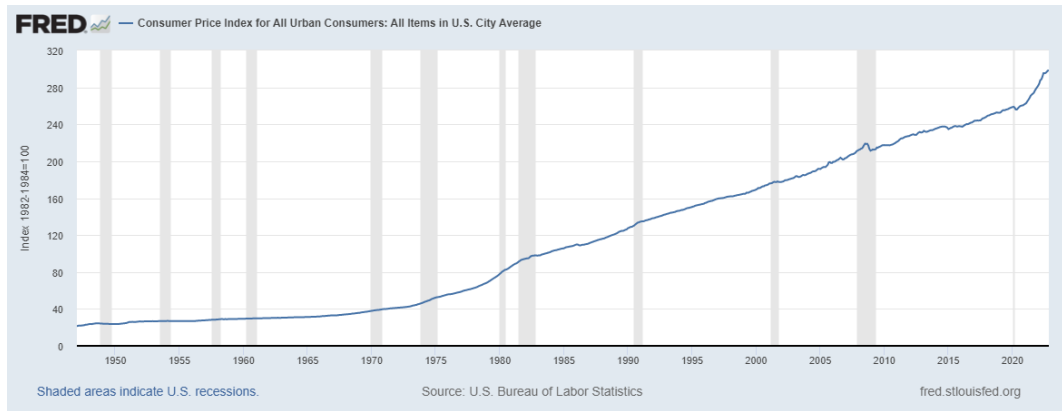$$u_t = \frac{U_t}{N_t} = \frac{U_t}{U_t + E_t}$$

where

- U_t = number of unemployed people, people who are looking for a job and don't have one
- E_t = number of employed people
- $U_t + E_t$ = **labor force**, total number of people who want to work
- Not everyone is in the labor force: children, retirees, military, full-time students, people not looking for a job, etc.
- Labor force participation rate:

$$LFPR_t = \frac{\text{Labor Force}_t}{\text{Population}_t}$$

Why do prices rise?

...and do they ever go down?

Consumer Price Index

$$P_t = \sum_{i=1} \omega_i P_{it}$$

where

- P_{it} = price of good i in period t
- ω_i = consumption weight of good i
- ω_i does not depend on t: allows us to compare the general price level of a fixed set of goods over time (in practice it is a bit more complicated than that!)

Inflation (month on month)

$$\pi_t = \frac{P_t - P_{t-1}}{P_{t-1}}$$

Inflation (year on year)

$$\pi_t^{yoy} = \frac{P_t - P_{t-12}}{P_{t-12}}$$

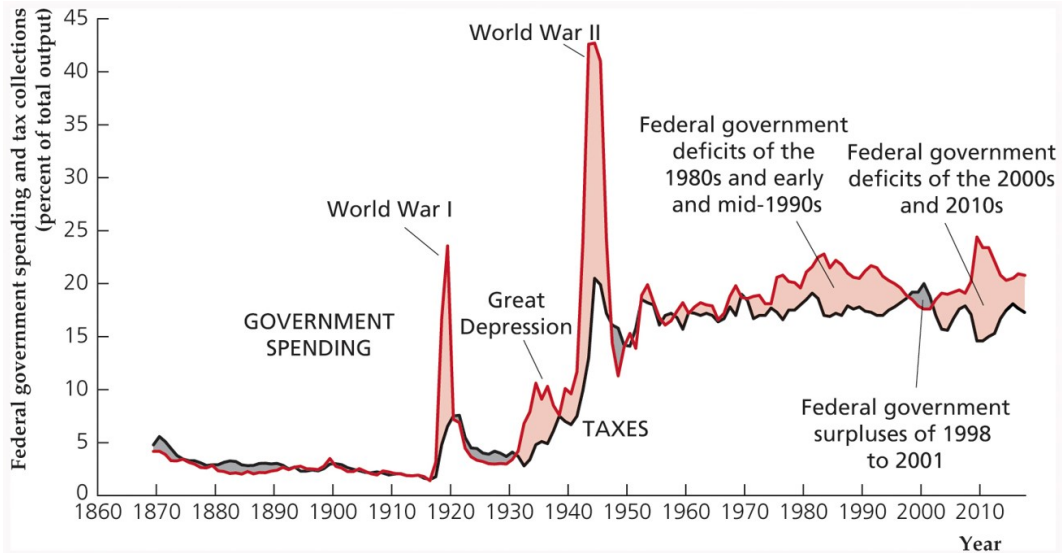# Can the government do anything about inflation and unemployment?

Fiscal Policy

▶ Relates to government spending, taxation, and the national debt

▶ Determined by the federal government, as well as state and local governments

Monetary Policy

▶ Relates to the money supply and interest rates

▶ Determined by the central bank

▶ The central bank of the United States is the Federal Reserve System (Fed)

US Government Spending and Revenue

Aggregation

► Aggregation underpins the key difference between microeconomics and macroeconomics

► Microeconomists traditionally study the individual decisions of economic agents, and in the equilibrium of individual markets

► Macroeconomics studies the aggregate effects of all such decisions, and how different markets are interconnected

Aggregation

▶ We will often talk about "aggregate output" or "aggregate consumption"

$$C_t = \sum_{i=1}^{N} c_{it}$$

▶ Aggregate consumption is the sum of individual consumption by all agents i in the economy, where N is the number of agents

$$c_{it} = \sum_{j=1}^{J} c_{jit}$$

▶ Individual consumption of agent i is the sum of consumption in all products and services j, where J is the number of consumption categories

What do macroeconomists do?

- ▶ Analysis
    - ▶ Private sector: financial institutions, consulting companies, technology companies, other large corporations, etc.
    - ▶ Public sector: Congressional Budget Office, White House Council of Economic Advisors, Federal Reserve, World Bank, International Monetary Fund, etc.

- ▶ Data development: Bureau of Economic Analysis, Bureau of Labor Statistics, Bureau of the Census, etc.

- ▶ Forecasting both in the public and private sectors

- ▶ Research
    - ▶ Universities
    - ▶ Policy institutions
    - ▶ Think tanks

Positive vs. Normative Economics

Key distinction in economics, source of much disagreement among different schools of thought

- ▶ **Positive economics** (or descriptive) tries to describe reality as it is, developing and testing statements about the economy that are objective and verifiable

    - ▶ What are the effects of a tax cut on output?
    - ▶ What determines the demand for healthcare services?
    - ▶ What are the effects of a rise in interest rates on inflation?
    - ▶ Does a change in tariffs affect imports?

- ▶ **Normative economics** is based on prescriptive statements, developing statements that cannot be tested as they depend on someone's opinion

    - ▶ Should the government cut taxes?
    - ▶ Should the government provide free healthcare to all citizens?
    - ▶ Should the Fed raise interest rates?
    - ▶ Should the US impose tariffs on China?

Disagreement in Macro

Important schools of thought:

▶ Classicals: focus on long-run equilibrium and self-correcting markets.

▶ Keynesians: emphasize market failures and frictions that affect equilibrium in the short-run, rationale for government intervention

▶ Neoclassical Synthesis: combines elements of both, Keynesian in the short-run and Classical in the long-run ⇒ approach followed in this course

▶ Heterodox: include Marxian, Austrian, Modern Monetary Theory (MMT), etc.

Broad Learning Objective

I'd like you to leave this course knowing how to **think like an economist**:

1. Correlation does not imply causation. Examples:

   ▶ Countries with more complex tax systems have higher income per capita

   ▶ Government spending rises in recessions

2. Economic agents respond to incentives (people, firms, etc.)

   ▶ Competitive markets typically lead to efficient outcomes

   ▶ Well-intended but poorly-designed policies can have very negative effects