

# Intermediate Macroeconomics

Econ 4021, Washington University in St. Louis

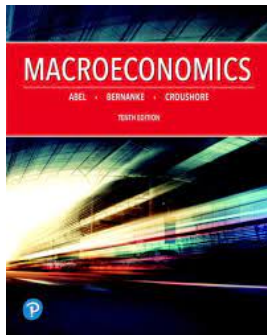
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Federal Reserve Bank of St. Louis

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## This Course: Essential Info

- ▶ Econ 4021, Intermediate Macroeconomic Theory
- ▶ Lectures: Mondays and Wednesdays, 5:30-7:00pm, Seigle L002
- ▶ 27 lectures, including this one and two in-class midterms exam
- ▶ **Assistant to the Instructor:** Joseph Kachovec
- ▶ **Undergraduate TA:** Harry He
- ▶ **Textbook:** *Macroeconomics, Tenth Edition* (Abel, Bernanke & Croushore), Pearson

Textbook: a very low resolution picture of the cover



# This Course: Essential Info

- ▶ **Grading:** 10 homeworks (approximately weekly) + 2 midterms

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

- ▶ Homeworks cover roughly one chapter of the book
- ▶ They become available at midnight on Monday and are due next Sunday, 6pm
- ▶ First homework drops on January 23
- ▶ You can collaborate but everyone has to submit their own
- ▶ **Midterms**
  - ▶ Scheduled for March 8, April 26
  - ▶ Location: in-class, 17:30-19:00
  - ▶ Let me know at least a week before if you cannot make it

# This Course: Essential Info

## ► Office Hours

- Joe: Fridays, 2-4pm, [joseph.kachovec@wustl.edu](mailto:joseph.kachovec@wustl.edu)
- Harry: TBA, [h.honghan@wustl.edu](mailto:h.honghan@wustl.edu)
- Miguel: by appointment, [fmiguel@wustl.edu](mailto:fmiguel@wustl.edu)

## ► Prerequisites

- Econ 1021 and Econ 4011
- I assume you are familiar with elementary algebra and differential calculus
- It may be a plus if you are familiar with:
  - Basic statistics
  - Optimization
- All of this info (and more) in the syllabus available on Canvas

# Course Plan

1. Measurement (Chs. 1, 2)
2. Theory (Chs. 4, 5, 7, 8) - Midterm 1
  - ▶ Productivity, Output, and Employment
  - ▶ Consumption, Saving, and Investment
  - ▶ Growth
  - ▶ Assets, Money, and Prices
  - ▶ Business Cycles
3. Analysis (Chs. 9, 10, 11, 12, 14, 15) - Midterm 2
  - ▶ A general macro model
  - ▶ Classical analysis
  - ▶ Keynesian analysis
  - ▶ Unemployment and inflation
  - ▶ Monetary policy
  - ▶ Fiscal policy

# 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>

# Learning Objectives

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

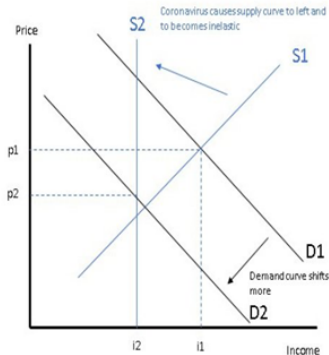
1. Have a good grasp of what the main macroeconomic aggregates are and how they are measured
  - ▶ i.e., GDP, inflation, government spending, interest rates, labor force participation
2. Understand the meaning of changes in those aggregates
  - ▶ i.e., “real GDP grew by an annualized 3% this quarter”, “year-on-year inflation was 5.4% last month”, “labor force participation fell to an historic low of 61%”
3. Use 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 the stock market?
  - ▶ What does this imply for the debt-to-GDP ratio?



# Learning Objectives

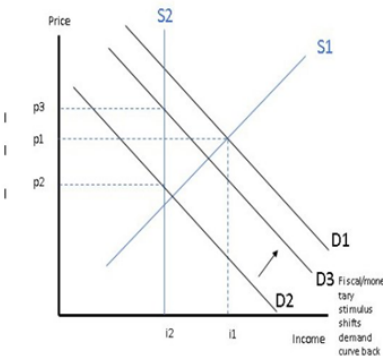
By the end of this course you should be able to understand what is going on in this figure, from a Deutsche Bank market research report

Figure 1: Present equilibrium is slightly deflationary - the supply curve has shifted and become vertical but the demand curve has shifted more



Source : Deutsche Bank

Figure 2: But fiscal and monetary stimulus will shift demand curve back towards pre coronavirus position, pushing up prices



Source : Deutsche Bank

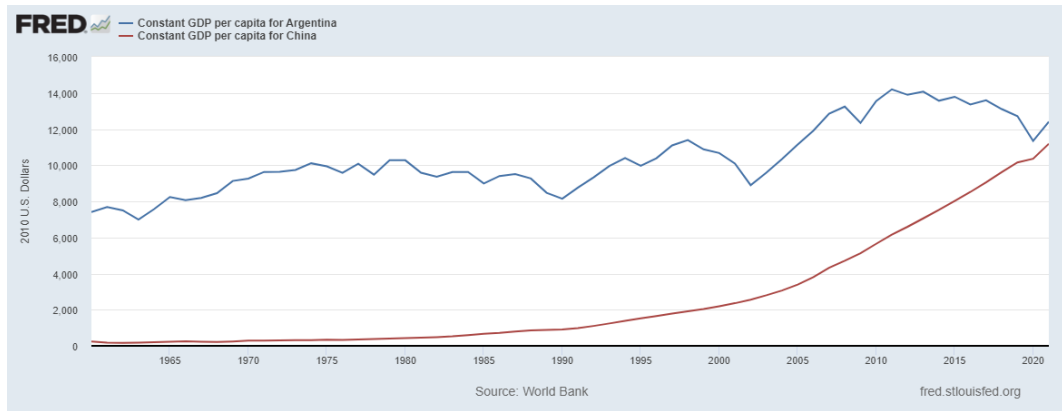
# What is Macroeconomics?

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

- ▶ 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:

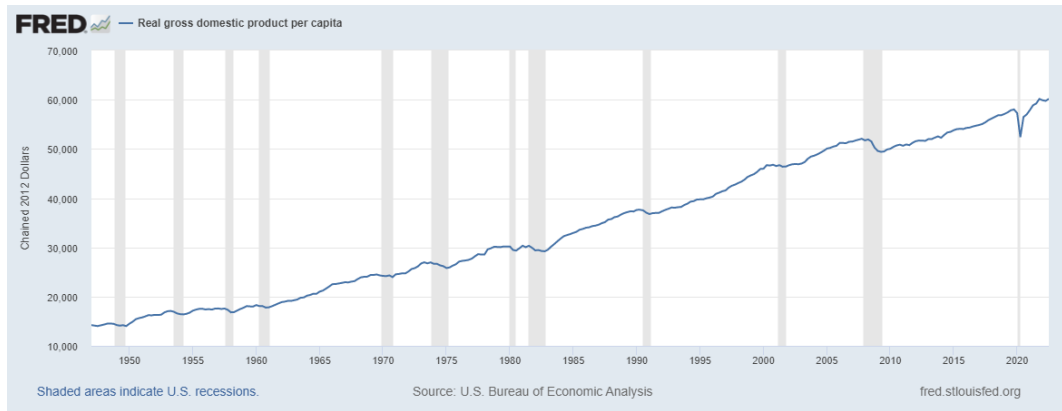
# Why do some countries grow so fast?

...while others stagnate?



# Why do economies experience business cycles?

...and what determines their length and intensity?



## Real gross domestic product per capita

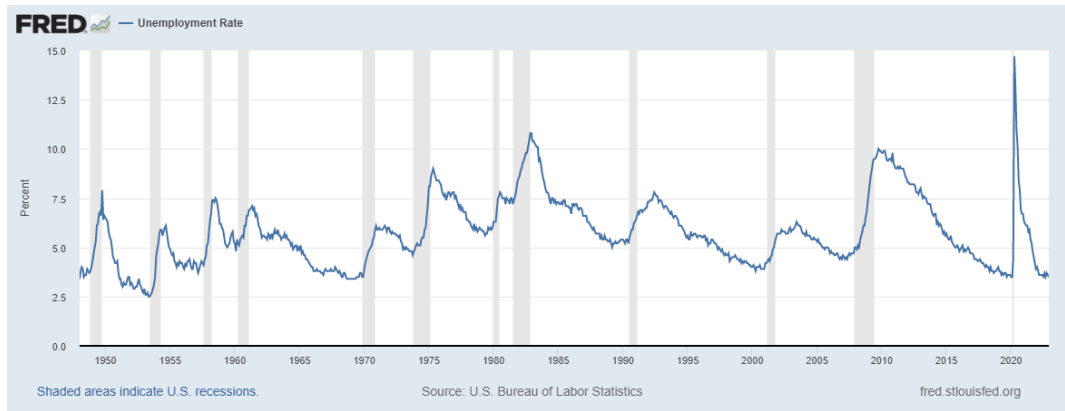
$$y_t = \frac{P_t Y_t}{P_{2012} N_t}$$

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

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

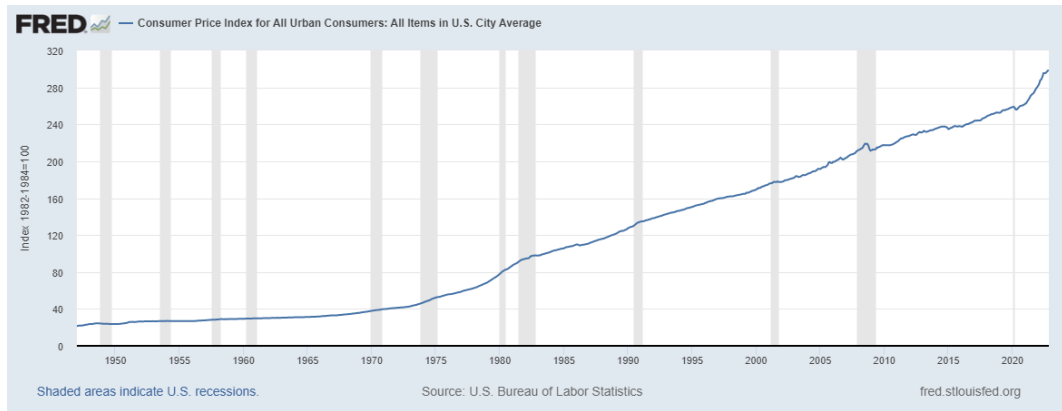
where

- ▶  $U_t$  = 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, 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  $t$
- ▶  $\omega_i$  = consumption weight of good  $i$
- ▶  $\omega_i$  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)

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

# Can the government do anything about inflation and unemployment?

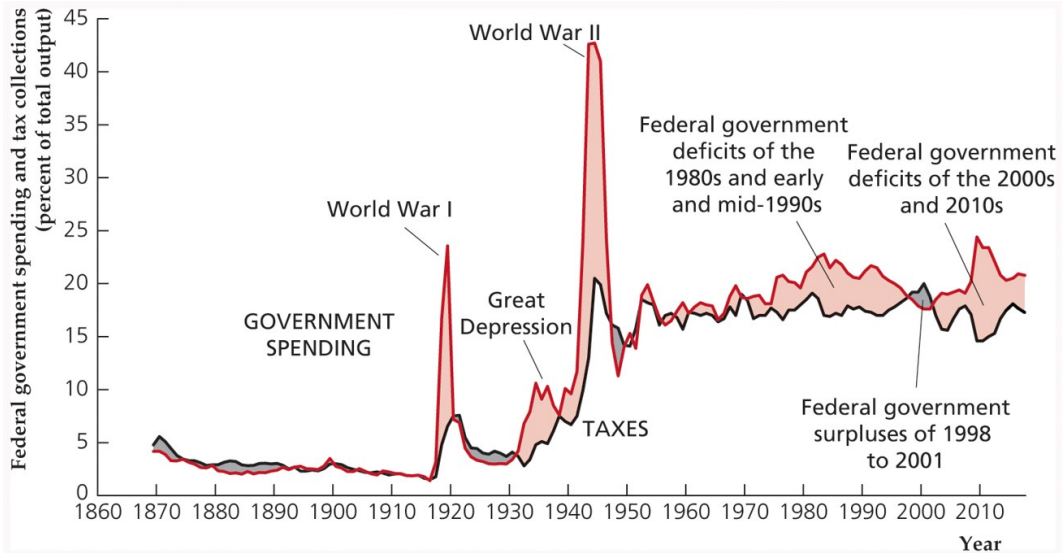
## **Fiscal Policy**

- ▶ 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

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

- ▶ Individual consumption of agent  $i$  is the sum of consumption in all products and services  $j$

# 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** 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

- ▶ Classicals
- ▶ Keynesians
- ▶ Neoclassical synthesis
  - ▶ Keynesian in the short-run
  - ▶ Classical in the long-run
  - ▶ Approach we take in this course
- ▶ Heterodox schools (Marxians, Austrians, MMT, etc.)