



# MgtEcon 300 — Session 1: Growth and Stabilization in the Global Economy

Chad Jones  
Stanford GSB

## Outline of Today's Class

- What is macroeconomics?
- An outline of the course
- The macroeconomics of the long run
- The macroeconomics of the short run
- Some basic tools

## What is Macroeconomics?

- Why is an average American today more than 10 times richer than the average American 100 years ago?
- Why is average income per person in Singapore 50 times higher than average income in Haiti?
- What determines the rate of inflation? Why the recent spike?
- What determines the level of unemployment?
- What role does the government play in recessions and booms?
- How do financial markets affect the real economy?

## Course Outline

### 1 The Long Run

- Why are some countries richer than others?
- Why do economies grow?
- What determines inflation and unemployment in the long run?
- Why do countries trade?

### 2 The Short Run

- What causes recessions and booms?
- Monetary and fiscal policy
- Financial crises
- Exchange rates and the international financial system



## Models, Data, Discussion

- Use models to understand data and perform quantitative analysis
- Many open questions (no parallel universe machine!)
- Lots of class discussion
- Understand long run trends, current events, and policy debates

## Course Logistics // Review the Syllabus

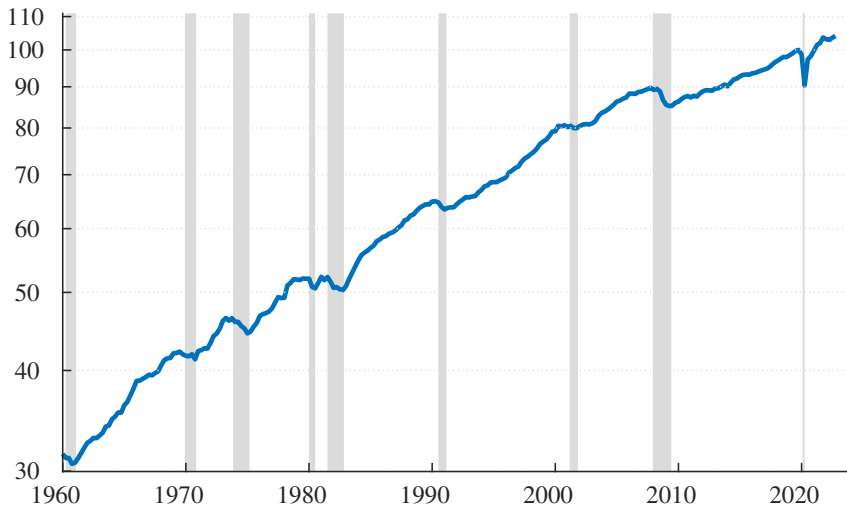
- Four assignments (groups up to 4 people)
- Take-home midterm and final (solo work)
- Optional 15-minute student presentations at end of quarter
- Redacted handouts for class. Full slides posted on Canvas after class.
- Canvas / syllabus contain articles to read before class (cold call)
- Attendance required: Two unexcused absences permitted
- No electronics
- Course TA w/ office hours: Shifrah Aron-Dine (see syllabus/Canvas)
- My office hours: after class and Wednesdays 2-3pm



# The Macroeconomics of the Long Run

## Real GDP per Person in the United States

REAL GDP PER PERSON (2019Q4=100)



## Name that Country

- Life expectancy is less than 50 years
- 1 out every 10 infants dies before the age of one
- More than 90% of households have no electricity, refrigerator, telephone, or car
- Fewer than 10% of adults have completed high school.

What country is it?

## Name that Country

- Life expectancy is less than 50 years
- 1 out every 10 infants dies before the age of one
- More than 90% of households have no electricity, refrigerator, telephone, or car
- Fewer than 10% of adults have completed high school.

What country is it?

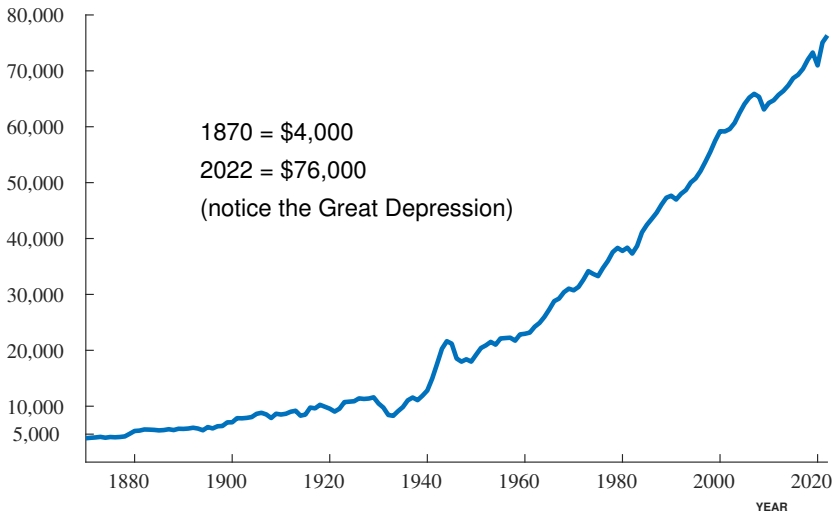
The United States circa 1890!

## The Power of Economic Growth

- In just a century, the U.S. economy has been completely transformed
  - Almost all households have electricity, refrigerators, cell phones, and cars
  - Overwhelming majority graduates from high school, many college
  - New goods: air-conditioning, dishwashers, jet planes, skyscrapers, home movie theaters, iPads, ChatGPT
- Health: Life expectancy in 1900 = 50 years, today 79 years
  - The richest person in the world in the mid 1800s — the European financier Nathan Rothschild — died from an infection that \$10 of antibiotics would cure today.

## GDP per Person has Grown by a Factor of 18 since 1870

PER CAPITA GDP (2022 DOLLARS)

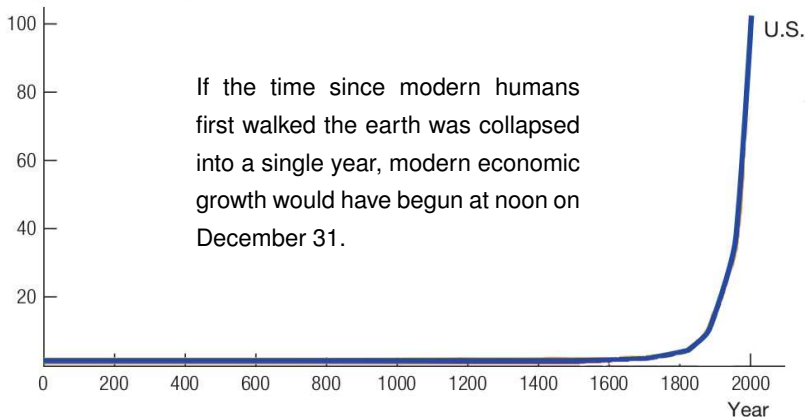




## GDP per Person in the United States

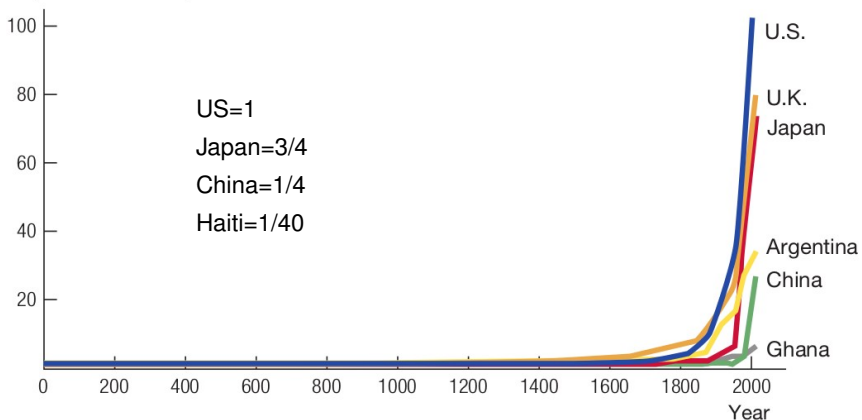
Until recently, extreme poverty was the condition of nearly every human on Earth.

Per capita GDP  
(multiple of 300 dollars)



## GDP per Person around the World

Per capita GDP  
(multiple of 300 dollars)





## Key Tools:

# Growth Rates and Ratio Scales

(see end of slide deck for some additional tools to review)

## Growth Rates

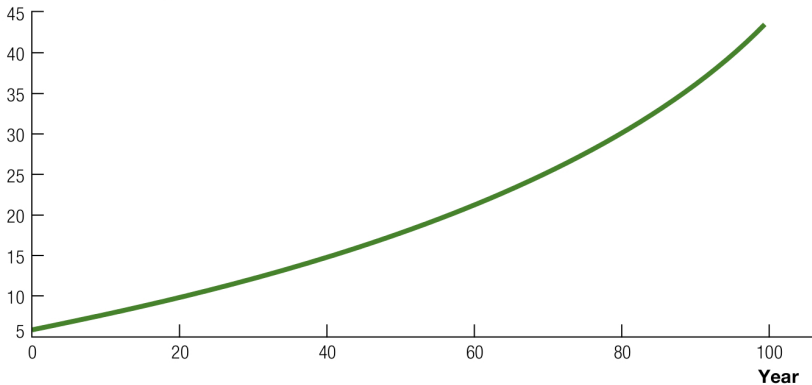
- Growth Rate = Average Annual Percentage Change
- Example: The growth rate of GDP between 2022 and 2023 is

$$\frac{GDP_{2023} - GDP_{2022}}{GDP_{2022}}$$

- To compute the growth rate between 1960 and 2023, we can compute the growth rate in each year and take the average
  - There are other mathematical techniques to make this even easier; if interested, see the textbook, pp. 50–54

## Is Population Growing at a Constant Rate here?

Population  $L$  (billions)



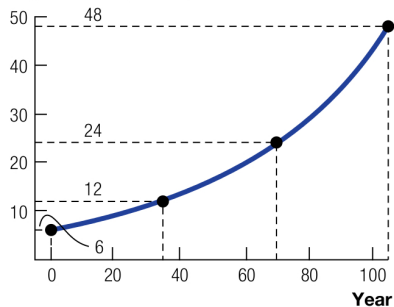
## Ratio Scale

- A **ratio scale** helps us see growth rates
  - Sometimes called a “logarithmic scale” (e.g. Excel)
- Idea: Label the vertical axis as “1 2 4 8” instead of “1 2 3 4”
- Labels rise by a constant *proportion* (e.g. a factor of 2 or 10) instead of by a constant amount (e.g. by 1 or 100)
  - Traditional scale: “100 200 300 400” “5 10 15 20”
  - Ratio scales: “100 200 400 800” “1 10 100 1000”
- Why does this help us see growth rates?

Growth at a constant rate looks like a straight line on a ratio scale

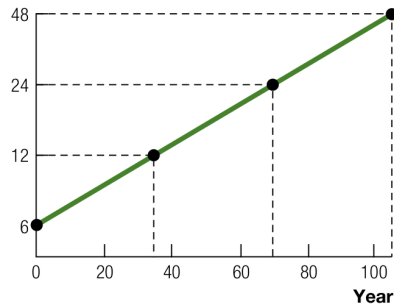
## Population over Time: Traditional and Ratio Scales

Population  $L$  (billions)



(a) On a standard scale...

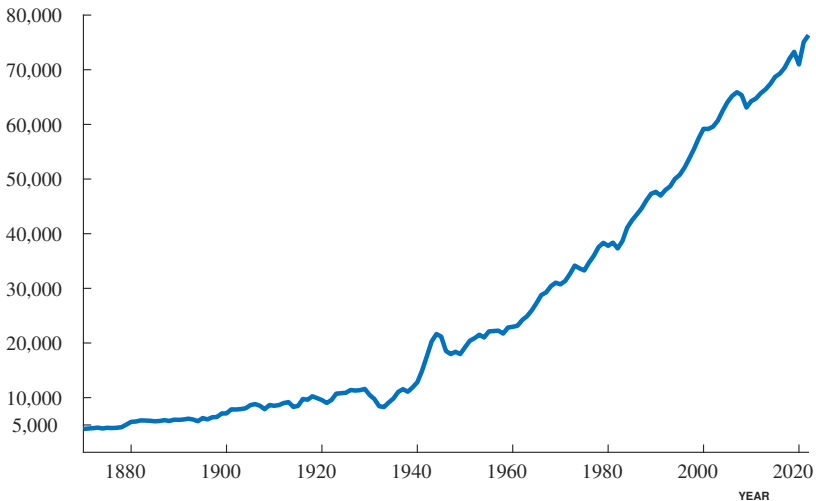
Population  $L$  (billions)  
(ratio scale)



(b) and a ratio scale.

## U.S. GDP per Person on a Traditional Scale

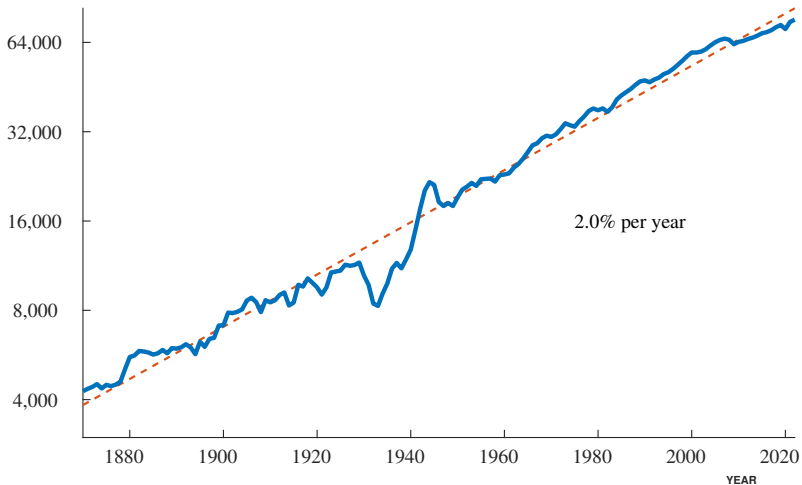
PER CAPITA GDP (2022 DOLLARS)





## U.S. GDP per Person on a Ratio Scale

PER CAPITA GDP (RATIO SCALE, 2022 DOLLARS)



## Transformative Economic Growth: International Edition

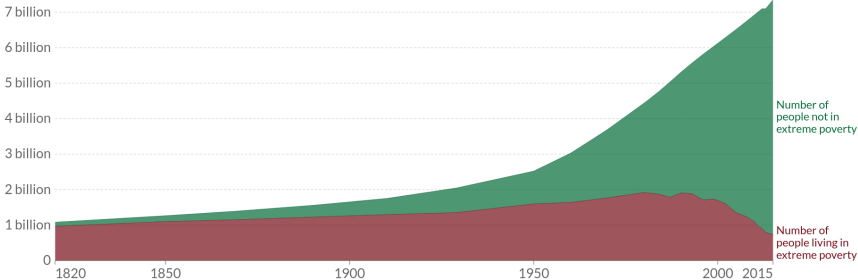
- South Korea: Sustained growth of 6% since 1960
  - Doubles every 12 years
  - In 50 years — about two generations — doubles 4 times  
 $\Rightarrow 2^4 = 16$  times richer than grandparents!!
- Contrast with Madagascar or Haiti
  - Negative growth for 50 years
  - Grandchildren are poorer than grandparents

*Growth is like compound interest: small differences in growth rates compound over time to generate enormous differences in incomes*

# World Population and Poverty

Extreme poverty is defined as living on less than 1.90 international-\$ per day.  
International-\$ are adjusted for price differences between countries and for price changes over time (inflation).

□ Relative



Source: Ravallion (2016) updated with World Bank (2019)

[OurWorldInData.org/extreme-poverty/](https://OurWorldInData.org/extreme-poverty/) • CC

- Historically, a large fraction of global population was impoverished
- Declining absolute numbers since 1990 — growth in China and India



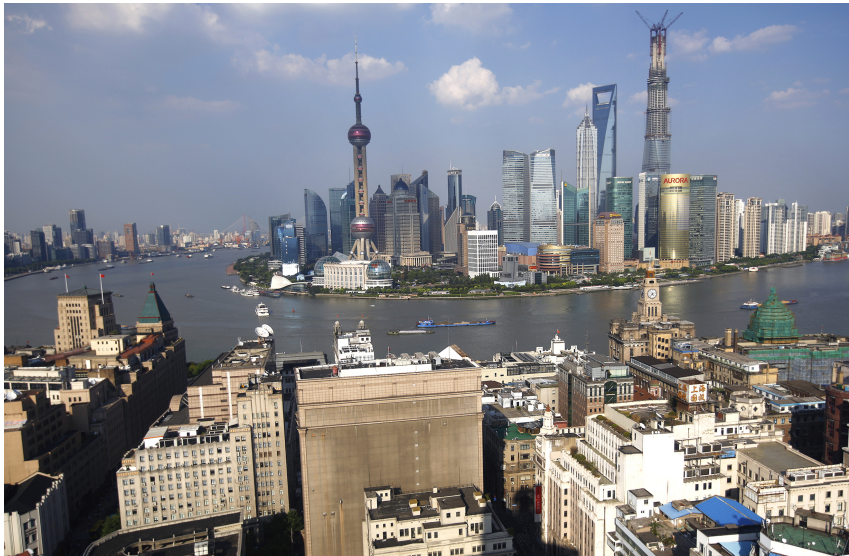
# The Power of Free Markets

Why business school is important

## Shanghai 1987



## Shanghai 2013



## The Power of Free Markets

- “Free Markets” sometimes has a negative connotation in the media
  - Of course, businesses have their problems
  - But you are at a business school for a good reason:

*The stunning transformation provided by economic growth is intimately linked to business*

- “Free Markets” = umbrella encompassing
  - Property Rights
  - Rule of Law
  - Incentives
  - Competition
  - Innovation and Creative Destruction

*This theme will show up throughout the course*

## Role of Government

- Free markets does not mean the absence of government
- Governments have an essential role to play
  - Provide the key ingredients on previous slide
  - Where this fails, countries are often impoverished
- Limits of Free Markets
  - Growth versus inequality (social insurance)
  - Externalities: pollution, climate change
  - Regulation versus creative destruction

These tensions will also feature in the course



## Famous Lucas Quotation

*I do not see how one can look at figures like these without seeing them as representing possibilities. Is there some action a government of India could take that would lead the Indian economy to grow like Indonesia's or Egypt's? If so, what exactly? If not, what is it about the "nature of India" that makes it so? The consequences for human welfare involved in questions like these are simply staggering: Once one starts to think about them, it is hard to think about anything else.*

— Robert E. Lucas, Jr., 1995 Nobel Prize winner



# The Macroeconomics of the Short Run

## The Macroeconomics of the Short Run

*But this “long run” is a misleading guide to current affairs. “In the long run” we are all dead. Economists set themselves too easy, too useless a task if in tempestuous seasons they can only tell us that when the storm is long past the ocean is flat again.*

*John Maynard Keynes, 1923*

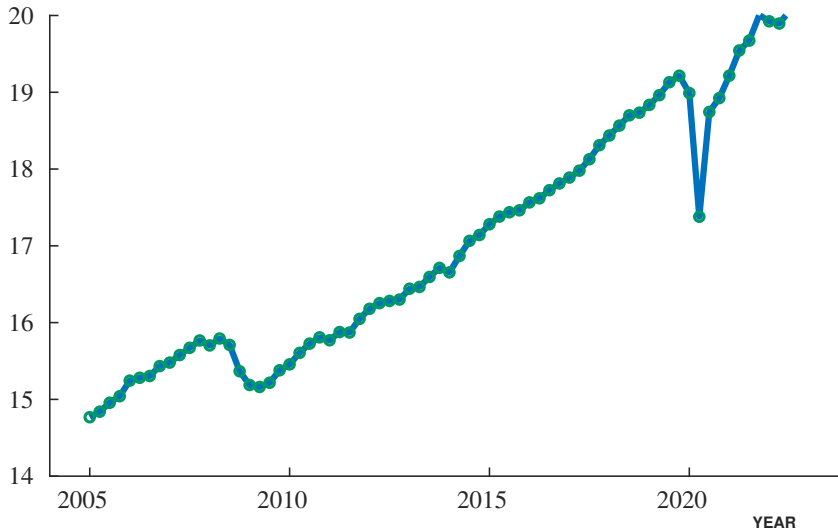
## The Macroeconomics of the Short Run

In the second half of the course, we will talk about

- Booms and recessions — the Covid-19 recession
- Unemployment
- Inflation — the recent surge in inflation around the world
- Monetary and fiscal policy
- Financial crises
- Exchange rates

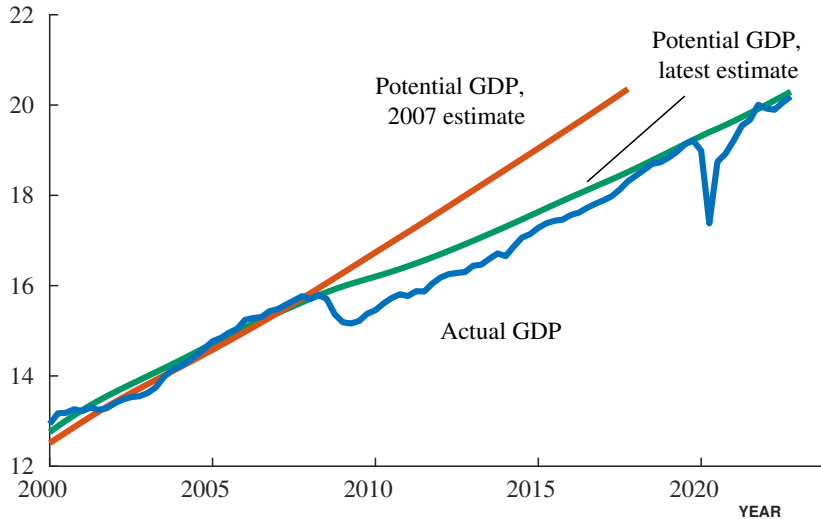
## U.S. Real GDP in Recent Years

TRILLIONS OF 2012 DOLLARS

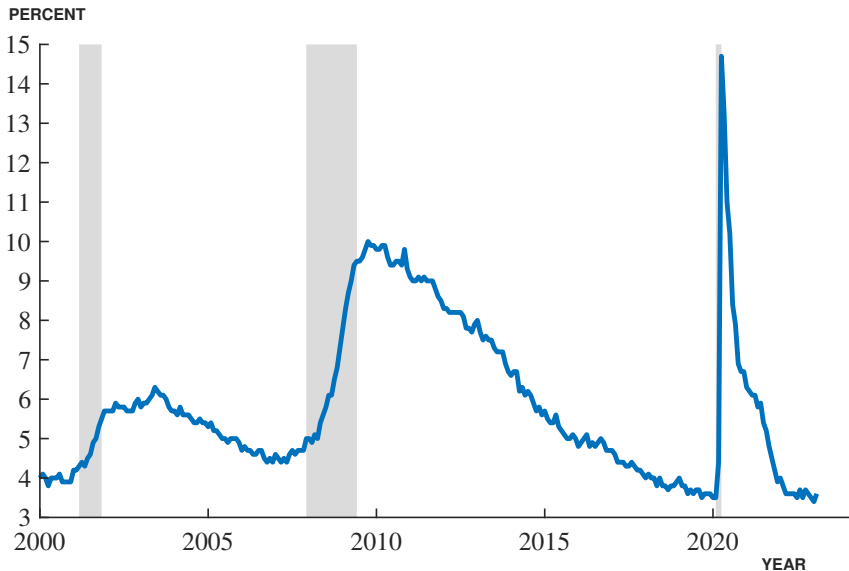


## U.S. Real GDP in Recent Years

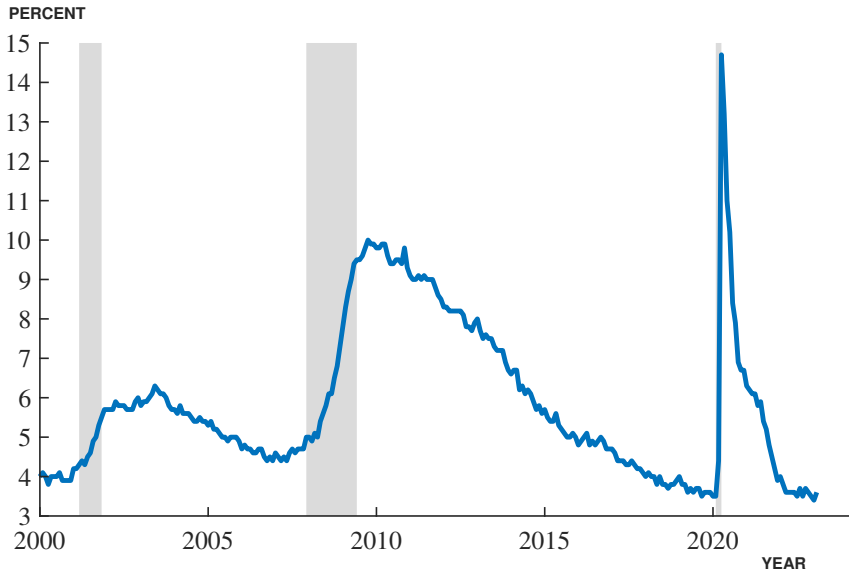
TRILLIONS OF 2012 DOLLARS



## What is this Graph?



## The U.S. Unemployment Rate

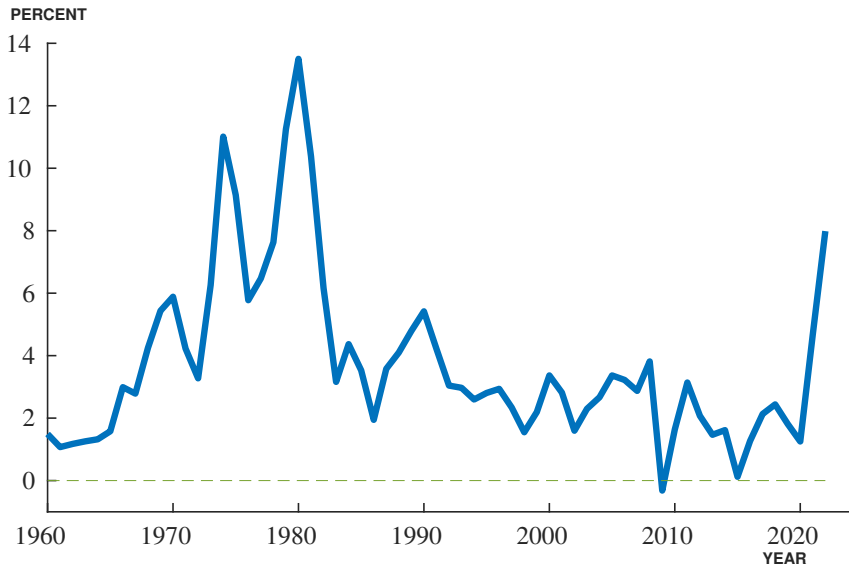




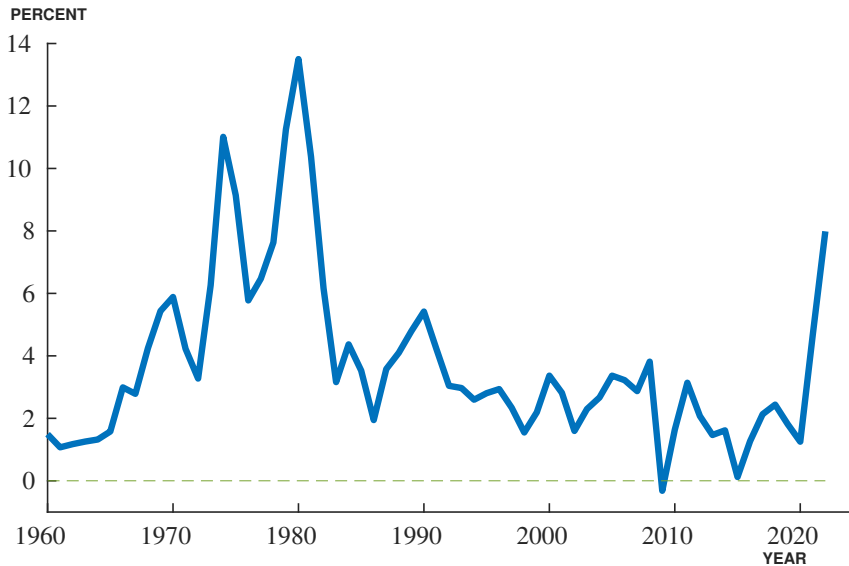
## Unemployment Rate in Spain



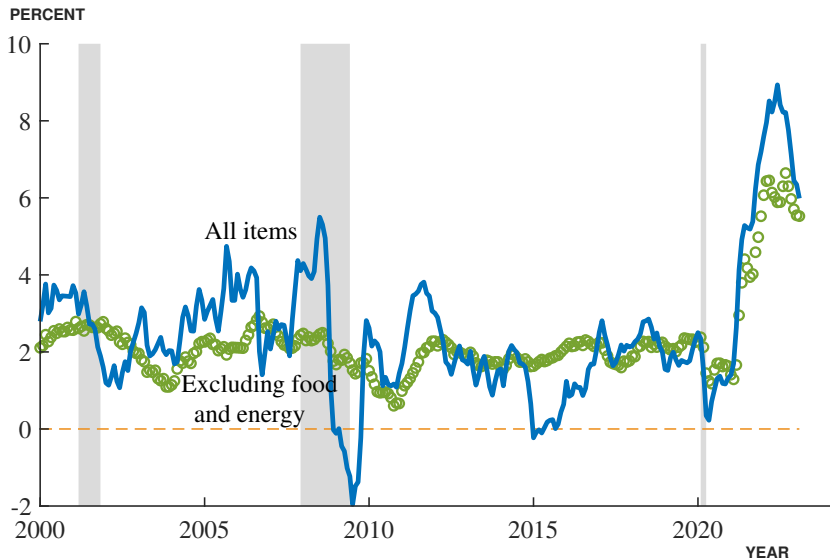
## What is this graph?



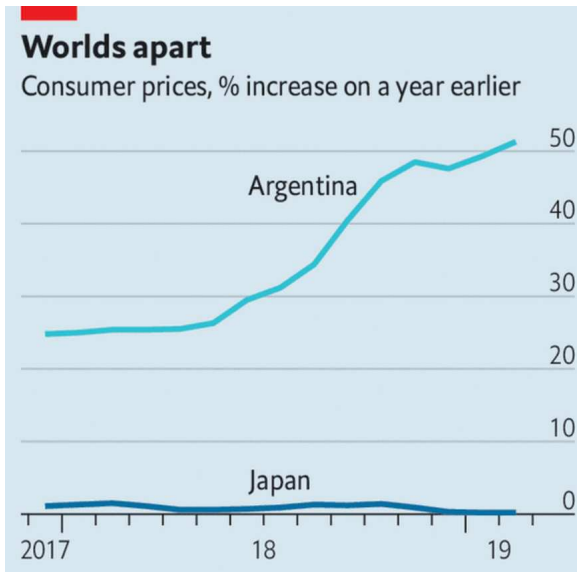
## Inflation in the U.S.



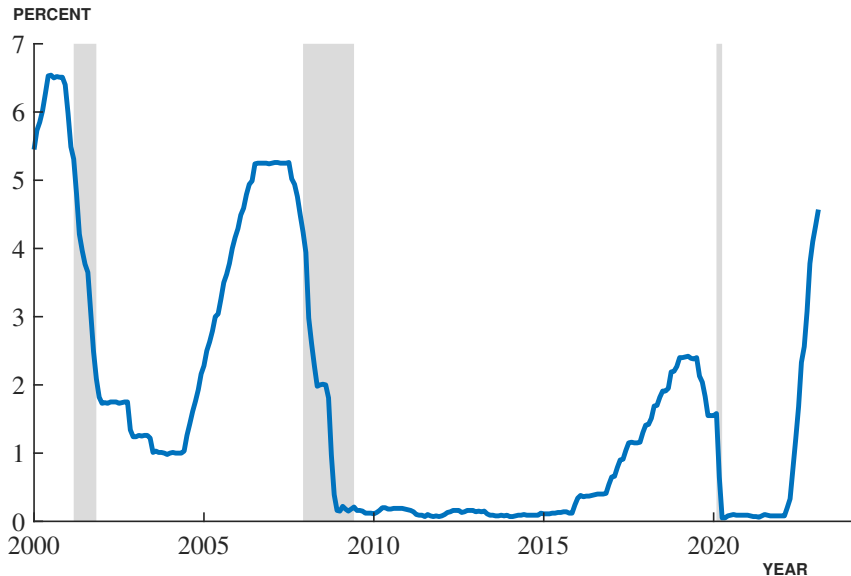
## Zooming in on recent inflation...



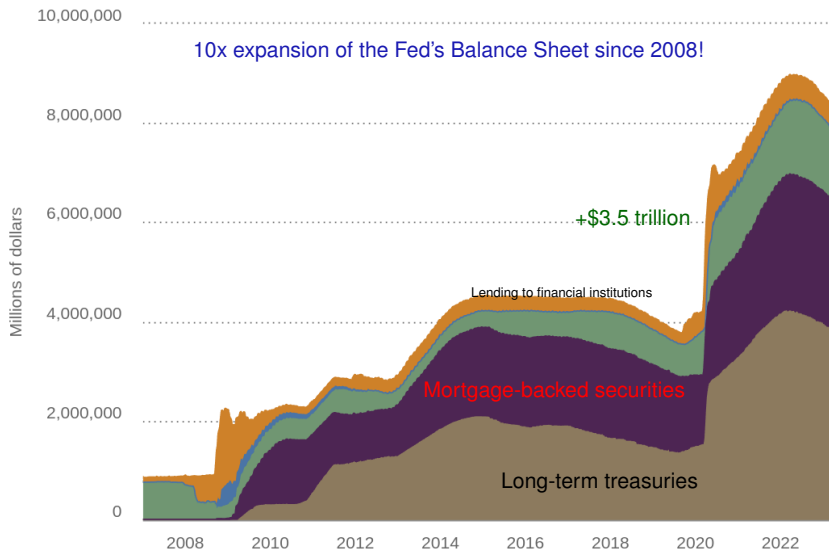
## Inflation in Argentina and Japan



## Monetary Policy in the U.S.: the Fed Funds Rate



## Unconventional Monetary Policy: Quantitative Easing





## Key Tool: National Income Accounting



## National Income Accounting

- What is **Gross Domestic Product** (or GDP)?

Gross Domestic Product (GDP) is the market value of the final goods and services produced in an economy during the year.

- In 2022, U.S. GDP = \$25 trillion, or \$76,000 per person (current \$).

## GDP: Production = Expenditure = Income

Suppose the entire economy consists of a single firm, **Grape.com**, which hires Stanford MBAs to make wine.

- **Production approach:**
  - GDP is total amount of wine produced in a year
  - Count the bottles as they are made
- **Expenditure approach:**
  - GDP is total amount of wine sold in a year
  - Count the bottles as they are sold to consumers
- **Income approach:**
  - GDP is the total income earned by the Stanford MBAs plus the “profits” made by **Grape.com**.
  - Distinguish economic profits versus accounting profits.

*These are three equivalent ways to measure GDP.*

## The National Income Identity

$$Y = C + I + G + NX$$

$Y$  = GDP (in dollars)

$C$  = Consumption

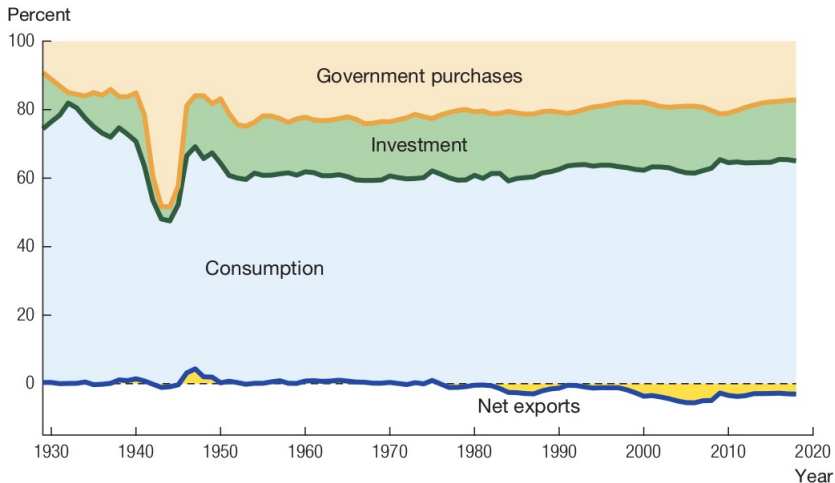
$I$  = Investment

$G$  = Government purchases

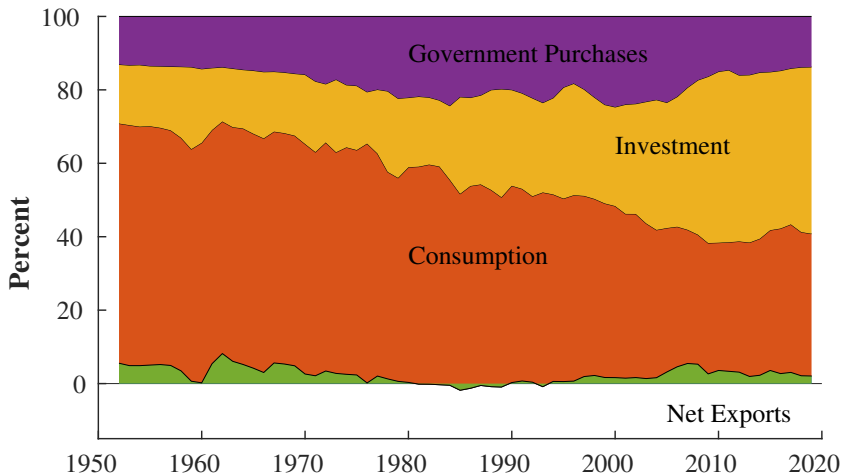
$NX$  = Net exports = exports (EX) - imports (IM)

$$Y + IM = C + I + G + EX$$

## The Composition of U.S. GDP



## The Composition of China's GDP



## Real versus Nominal GDP

- GDP in 2022 was \$25 trillion, in 1995 was \$7.4 trillion.
- How much is more goods and services, and how much is higher prices?

$$\text{Nominal GDP} = \text{Price Level} \times \text{Real GDP}$$

Nominal GDP = Value in current dollars

Price Level = Price index

Real GDP = Quantity of goods and services

– e.g. “in 2012 dollars” or “in constant prices”

Nominal GDP conflates both changes in the price level and changes in the amount of goods and services. Real GDP strips out changes in prices.

- Applying our growth rules to this equation:

$$\mathcal{G}_{\text{nominal}} = \mathcal{G}_{\text{prices}} + \mathcal{G}_{\text{real}} \\ \text{inflation}$$



## Tools to Review on Your Own

## Rule of 70

- Growing at a constant rate of  $g\%$  per year, GDP (or anything else) will double approximately every  $70/g$  years.

$$\text{Rule of 70: Years to Double} = \frac{70}{g}$$

- Examples
  - Growing at 2%: Double every  $70/2=35$  years.
  - Growing at 5%: Double every  $70/5=14$  years.
  - Growing at 7%: Double every  $70/7=10$  years.
- Can reverse to estimate a growth rate when observing a “time to double”

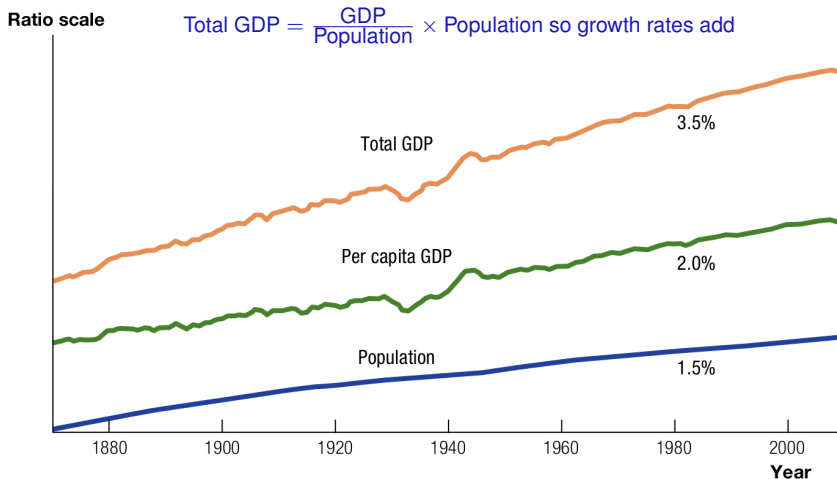


## Growth Rates of Products, Ratios, and Powers

- Key: Compute growth rates using math operations that are “one step lower”
  - Product  $\rightarrow$  Sum, Division  $\rightarrow$  Subtraction, Power  $\rightarrow$  Multiplication
- Consider two variables  $x$  and  $y$  with growth rates  $g_x$  and  $g_y$ 
  - Product:  $z = x \times y \Rightarrow g_z = g_x + g_y$
  - Ratio:  $z = x/y \Rightarrow g_z = g_x - g_y$
  - Power:  $z = x^a \Rightarrow g_z = a \times g_x$

*(see Section 3.5 of the textbook, pages 58–60)*

## U.S. GDP, Per Capita GDP, and Population



## Questions for Review

- What is the current state of the U.S. economy?
- What is economic growth and why does it matter?
- What is a growth rate? Give some examples of growth rates for various countries during various periods of time: U.S.? China? Others?
- What is the Rule of 70? How can it be used to compute growth rates over long periods of time?
- What is a ratio scale and how is it useful?
- In what ways are China and India important to world growth? (Keep this question in mind in coming weeks.)
- How do you calculate growth rates for products, ratios, and powers?