ECO5002 Introduction to Economics

Lecture 6: The Data of Macroeconomics

Long Ma

School of Management and Economics
Chinese University of Hong Kong, Shenzhen

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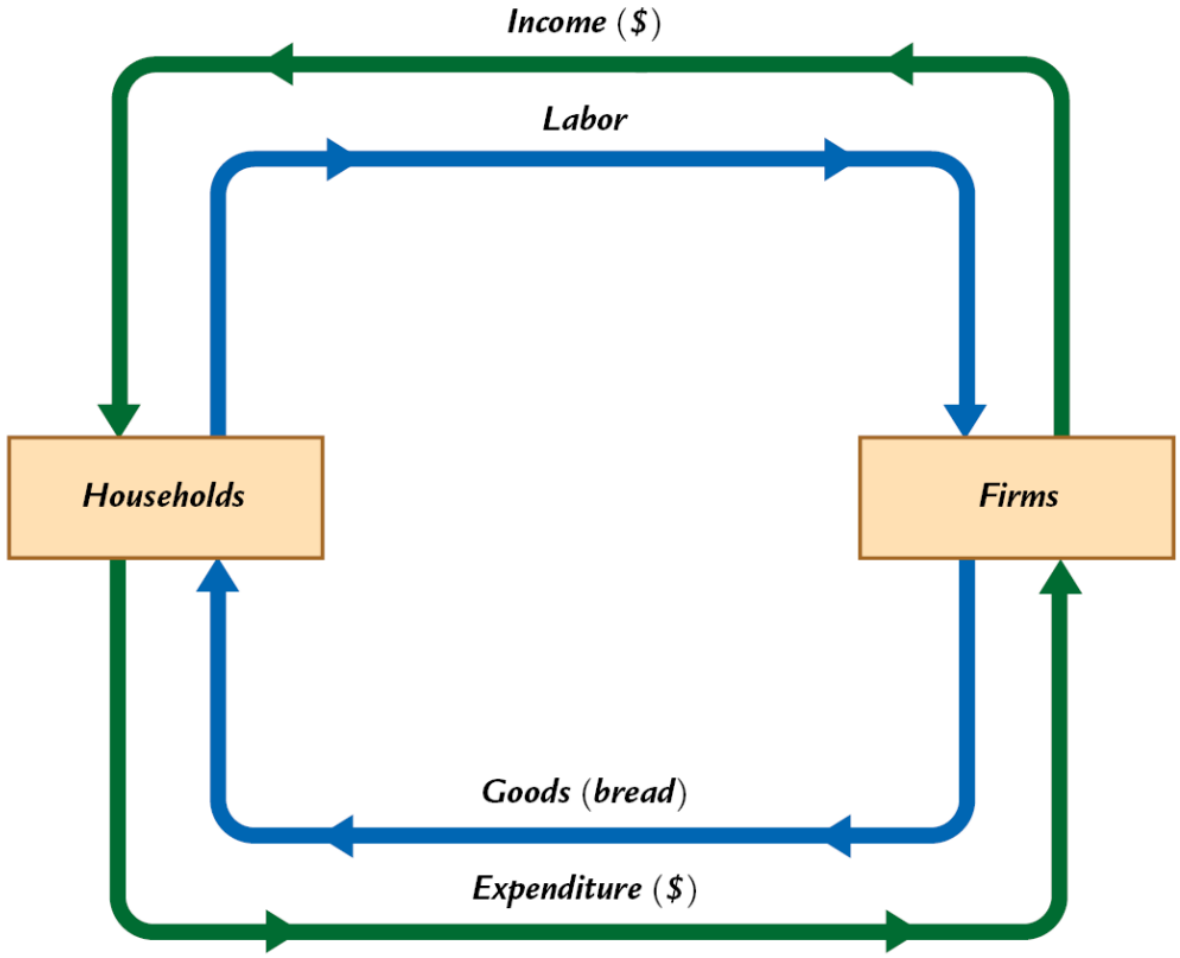
Before Start

- We have finished the Microeconomics part.
- **Macroeconomics** is the study of the economy as a whole. The goal of macroeconomics is to explain the *economic changes* that affect many households, firms, and markets simultaneously.
  - growth (long-run) & fluctuation (short-run)
  - subtopics: labor, development, financial, political, distributional...
- Macroeconomic story + Models with micro-foundation + Macro (or Micro) level data.
- Policy interventions.
  - monetary policy
  - fiscal policy
  - industrial policy
  - .....

I. Measuring a Nation's Income

- **Gross domestic product (GDP):** the market value of all final goods and services produced within a country in a given period of time.
  - market value = market price (to aggregate different goods).
  - only final goods/services are considered.
  - given period of time = flow data (but not stock data)
- Other measures of income:
  - **Gross national product (GNP)**: the total income earned by a nation's permanent residents (called nationals). It differs from GDP in that it includes income that our citizens earn abroad and excludes income that foreigners earn here.
  - **Net national product (NNP)**: the total income of a nation's residents (GNP) minus losses from depreciation.
  - National income (NI), Personal income (PI)...

I. Measuring a Nation's Income



- GDP is both the total expenditure on bread and the total income from the production of bread.

I. Measuring a Nation's Income

- The Components of GDP (**Identity**):

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

where Y is GDP, C is consumption, I is investment, G is government purchases, and NX is net exports.

- **C**: spending by households on goods and services, with the exception of purchases of new housing.
- **I**: the purchase of goods (called capital goods) that will be used in the future to produce more goods and services.
- **G**: spending on goods and services by local, state, and federal governments = gov. consumption + gov. investment.
- **NX**: the foreign purchases of domestically produced goods (exports) minus the domestic purchases of foreign goods (imports).

	Total (in billions of dollars)	Per Person (in dollars)	Percent of Total
Gross domestic product, Y	$17,938	$55,882	100%
Consumption, C	12,268	38,218	68
Investment, I	3,018	9,402	17
Government purchases, G	3,184	9,919	18
Net exports, NX	−532	−1,657	−3

Source: U.S. Department of Commerce. Parts may not sum to totals due to rounding.

I. Measuring a Nation's Income

- If total spending rises from one year to the next, at least one of two things must be true:
  1. the economy is producing a larger output of goods and services;
  2. goods and services are being sold at higher prices.
- **Real GDP** v.s. **Nominal GDP**
  - nGDP: the production of goods and services valued at current prices;
  - rGDP: the production of goods and services valued at constant prices.
- Mathematically,

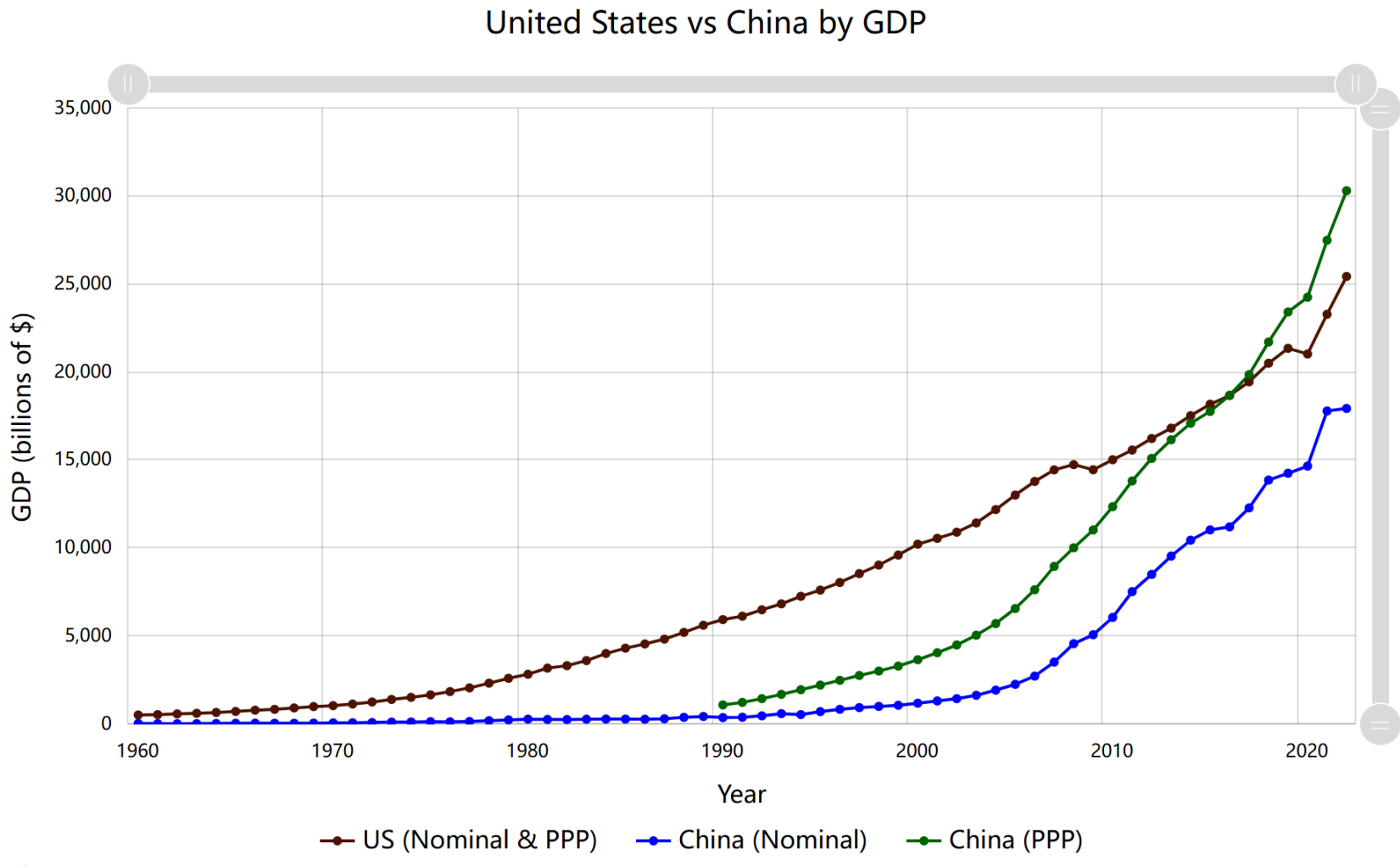
$$\text{nGDP} = \sum_i P_{i,t} \cdot Q_{i,t}$$

$$\text{rGDP} = \sum_i \overline{P}_i \cdot Q_{i,t}$$

where $\overline{P}_i$ is the price of good i in the base year.

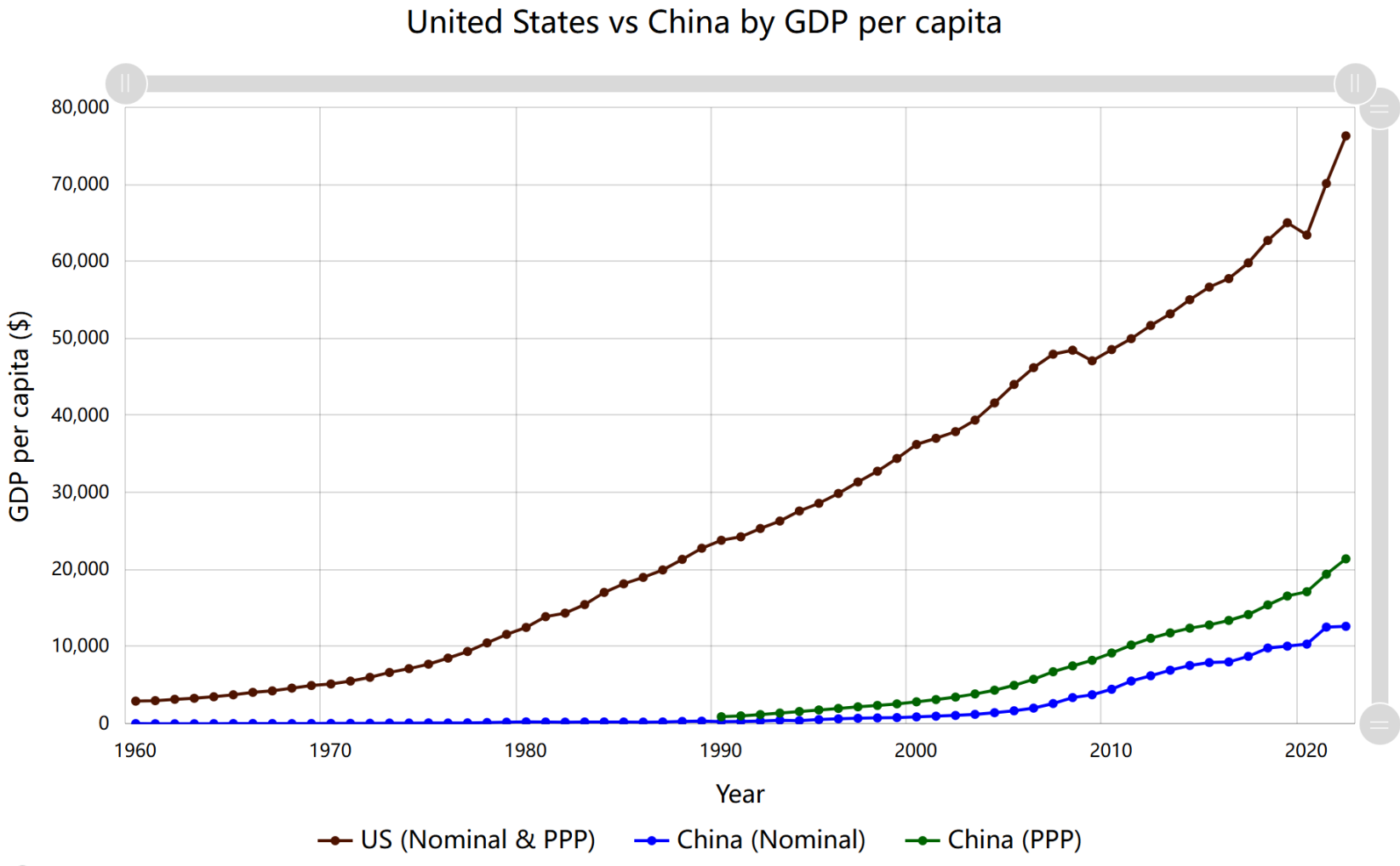
I. Measuring a Nation's Income

- China v.s. US



I. Measuring a Nation's Income

- China v.s. US



II. Measuring the Cost of Living

- **The GDP Deflator**: a measure of the price level calculated as the ratio of nominal GDP to real GDP times 100.

$$\text{GDP deflator} = \frac{\text{nGDP}}{\text{rGDP}} \times 100$$

  - for the base year,it always equals 100.
  - for subsequent years, it measures the change in nominal GDP from the base year that cannot be attributable to a change in real GDP.

- Economists use the term **inflation** to describe a situation in which the economy's overall price level is rising.

$$\text{Inflation Rate}_{t+1} = \frac{\text{GDP deflator}_{t+1} - \text{GDP deflator}_t}{\text{GDP deflator}_t} \times 100$$

II. Measuring the Cost of Living

- **The consumer price index (CPI)**: a measure of the overall cost of the goods and services bought by a typical consumer.

Step 1: Survey Consumers to Determine a Fixed Basket of Goods

Basket = 4 hot dogs, 2 hamburgers

Step 2: Find the Price of Each Good in Each Year

Year	Price of Hot Dogs	Price of Hamburgers
2016	$1	$2
2017	2	3
2018	3	4

Step 3: Compute the Cost of the Basket of Goods in Each Year

2016	($1 per hot dog × 4 hot dogs) + ($2 per hamburger × 2 hamburgers) = $8 per basket
2017	($2 per hot dog × 4 hot dogs) + ($3 per hamburger × 2 hamburgers) = $14 per basket
2018	($3 per hot dog × 4 hot dogs) + ($4 per hamburger × 2 hamburgers) = $20 per basket

Step 4: Choose One Year as a Base Year (2016) and Compute the CPI in Each Year

2016	($8/$8) × 100 = 100
2017	($14/$8) × 100 = 175
2018	($20/$8) × 100 = 250

Step 5: Use the CPI to Compute the Inflation Rate from Previous Year

2017	(175 – 100)/100 × 100 = 75%
2018	(250 – 175)/175 × 100 = 43%

II. Measuring the Cost of Living

Other measures:

- **core CPI**: a measure of the overall cost of consumer goods and services excluding food and energy.
- **The producer price index (PPI)**: a measure of the cost of a basket of goods and services bought by firms.

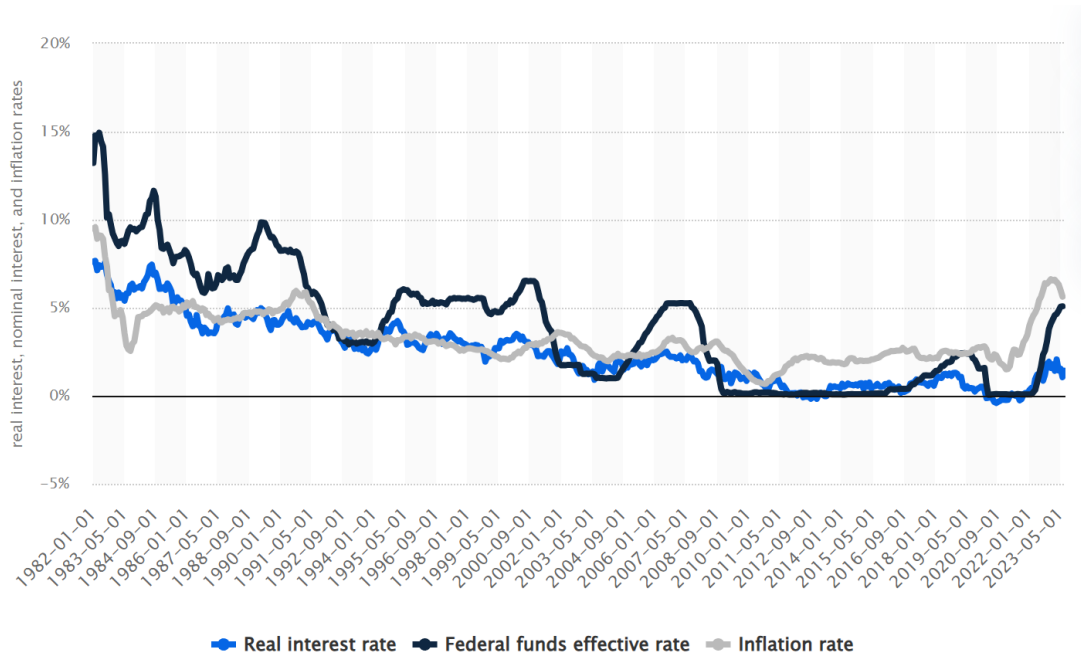
Problems in measuring the cost of living:

- **Substitution bias**: consumers substitute toward goods that have become relatively less expensive. (but the basket is fixed)
- **Introduction of new goods**: As new goods are introduced, consumers have more choices, and each dollar is worth more.
- **Unmeasured quality change**: if the quality rises from one year to the next, the value of a dollar rises.

II. Measuring the Cost of Living

- **Nominal interest rate**: the interest rate as usually reported without a correction for the effects of inflation.
  - in general, the nominal interest rate cannot be negative.
  - but the real interest rate can be smaller than zero.
- **Real interest rate**: the interest rate corrected for the effects of inflation. It can be calculated by:

  Real interest rate = Nominal interest rate − Inflation rate



III. Measuring Joblessness

- In US, the **unemployment rate** comes from a survey of about 60,000 households called the Current Population Survey. Each adult (age ≥ 16) is placed into one of three categories:
  - Employed.
  - Unemployed.
  - Not in the labor force: e.g., a full-time student, homemaker, or retiree.
- **Labor force** = No. of Employed + No. of Unemployed.
  - a person who wants a job but has given up looking - a discouraged worker - is counted as not being in the labor force.
- **Unemployment rate** $= \frac{\text{No. of Employed}}{\text{Labor force}} \times 100.$
  - **cyclical**: during an economic downturn, a shortfall of demand for goods results in a lack of jobs being available for those who want to work.
  - **structural**: there is a mismatch between the jobs that are available and the people looking for work.
  - **frictional**: this occurs when people move between jobs in the labour market, as well as when people transition into and out of the labour force.
- **Labor-force participation rate** $= \frac{\text{Labor force}}{\text{Adult Population}} \times 100.$

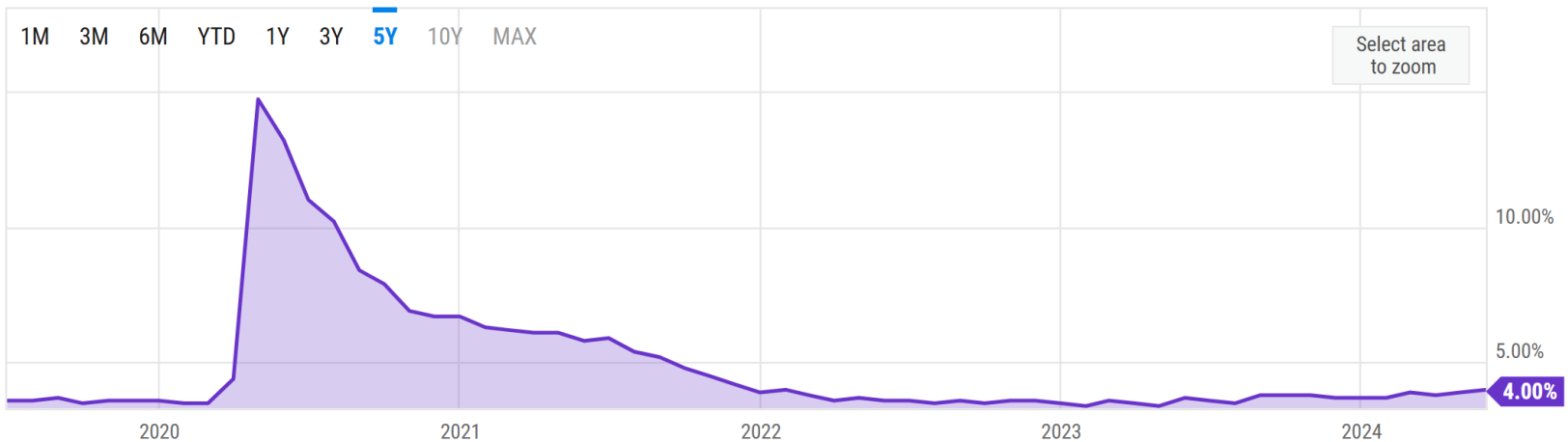
III. Measuring Joblessness

- The unemployment rate in China:

- this number dropped drastically during the initial stage of China's reform and open and keeps constant (around 4%) for a long time.

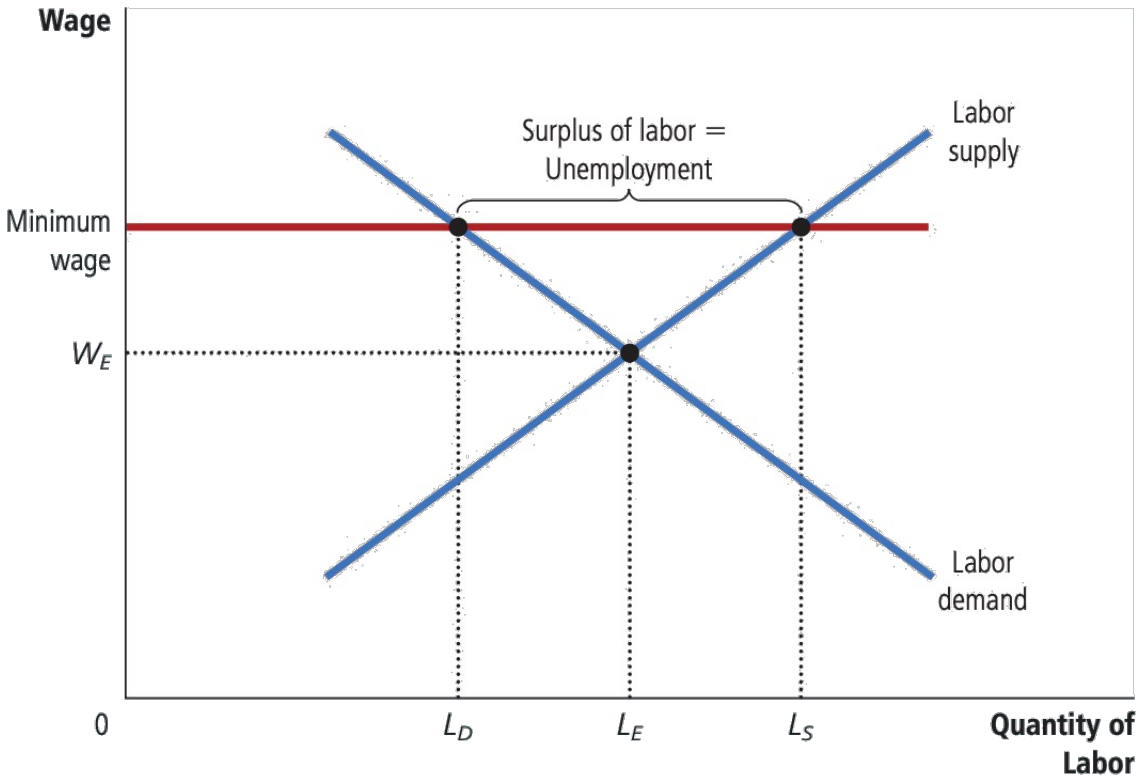
III. Measuring Joblessness

- The unemployment rate in US:
  - unemployment rate is positively associated with economic recessions.



III. Measuring Joblessness

- Unemployment and Minimum Wage:
  - if the wage is kept above the equilibrium level for any reason, the result is unemployment.



Reading

- Chapter 23 $\sim$ 24, 28, *Principles of Economics* by Mankiw.
- Chapter 2, *Macroeconomics* by Mankiw.