Principles of Economics

Chapter 6: Macroeconomic Indicators

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Agenda

6. Macroeconomic Indicators
   - Economic Activity
   - Cost of Living
   - Employment

Reading:

- Mankiw/Taylor (2023), Chapters 20, 22
- Mankiw (2025), Chapter 2

Gross Domestic Product

Gross Domestic Product (GDP): Measure of domestic economic activity in a given period of time that equivalently captures output, income, and expenditures

- Output Method: GDP is the market value of domestic production.
- Income Method: GDP is the sum of incomes from domestic production.
- Expenditure Method: GDP is the sum of expenditures on domestic production.

Gross Domestic Product

Components of GDP: Let Y denote output, income, and expenditures, respectively.

- Output can be represented as a function of labor L and capital K.

$$Y = F(L, K)$$

- Income can be decomposed into labor income wL and capital income rK.

$$Y = wL + rK$$

- Expenditures can be decomposed into private consumption C, investment I, government consumption G, and net exports NX (exports EX minus imports IM).

$$Y = C + I + G + \underbrace{NX}_{EX-IM}$$

Gross Domestic Product

Nominal GDP: GDP at current market prices

- Changes in nominal GDP reflect changes in output and prices.

Real GDP: GDP at constant market prices of a particular base period

- Changes in real GDP reflect changes in output only.

Example: Two-goods economy

Base Period: 2024

	Output of Apples	Price per Apple	Output of Oranges	Price per Orange	Nominal GDP	Real GDP
2024	1,000	1	1,000	1	2,000	2,000
2025	900	1.05	1,200	0.98	2,121	2,100

Price Level

Price Index: Weighted average of the market prices of a set of goods normalized to a base period ($t = 0$)

- Paasche Index: Price index that uses current period weights

$$P_t^P = \frac{\sum_{i=1}^{n} (p_{i,t} \cdot Q_{i,t})}{\sum_{i=1}^{n} (p_{i,0} \cdot Q_{i,t})}$$

- Laspeyres Index: Price index that uses base period weights

$$P_t^L = \frac{\sum_{i=1}^{n} (p_{i,t} \cdot Q_{i,0})}{\sum_{i=1}^{n} (p_{i,0} \cdot Q_{i,0})}$$

Inflation Rate: Relative change in the price index between two periods

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

Price Level

GDP-Deflator: A Paasche Index that measures price changes of domestic output

$$\text{GDP-Deflator} = \frac{\text{Nominal GDP}}{\text{Real GDP}}$$

Consumer Price Index (CPI): A Laspeyres Index that measures price changes of a particular consumer basket

$$\text{CPI} = \frac{\text{cost of base-period consumer basket at current prices}}{\text{cost of base-period consumer basket at base-period prices}}$$

Example: Two-goods economy

Base Period: 2024

	Output of Apples	Price per Apple	Output of Oranges	Price per Orange	GDP-Deflator	CPI
2024	1,000	1	1,000	1	1	1
2025	900	1.05	1,200	0.98	1.01	1.015

Labor Force Ratios

Labor Force: Total number of people who are able and willing to supply labor

- The labor force L, which is a subset of the adult population N, comprises the employed E and the involuntarily unemployed U.

Labor Force Participation Rate: Ratio of the labor force to the adult population

$$e = \frac{L}{N} = \frac{E+U}{N}$$

Unemployment Rate: Ratio of the unemployed to the labor force

$$u = \frac{U}{L} = \frac{U}{E+U}$$