180.101 Elements of Macro - TA Section - Week 5

Qingyuan Fang

qfang6@jh.edu

Slides on https://github.com/QingyuanFang/TA_ElementsOfMacro

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Q5 - Labor Force Statistics

- The Current Population Survey (CPS) is administered **every month**
- Who is NOT in the labor force?
  - Jobless people not actively seeking employment (no efforts made in past four weeks)
  - Retirees and stay-at-home parents
  - Many full-time students
  - Children (below age 16)
  - Institutionalized (Military personnel, prison workers, etc.)

Q5 - Labor Force Statistics

$$\text{Unemployment rate} = \frac{U}{LF} = \frac{U}{U+E} = \frac{1}{1+\frac{E}{U}}$$

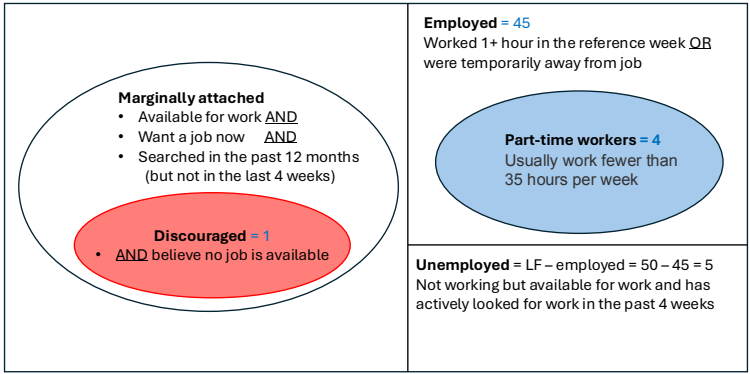
- If U increases and E remains constant, the unemployment rate will increase
- If U decreases and E remains constant, the unemployment rate will decrease

Q5 - Labor Force Statistics

- **Discouraged worker**: people who are not in the labor force (which means they are jobless and are not looking for work) + are available for work + want a job now + searched in last 12 months (but not in last 4 weeks) + believe no job is available.
- 1 Discouraged worker $\subseteq$ Neither-working-nor-looking-for-job 50 adults
- 4 Part-time workers $\subseteq$ Employed 45 adults (Professor mentioned this in class)

Q5 - Labor Froce Statistics

Working-age population (Civilian noninstitutional population age 16 and older) = 100

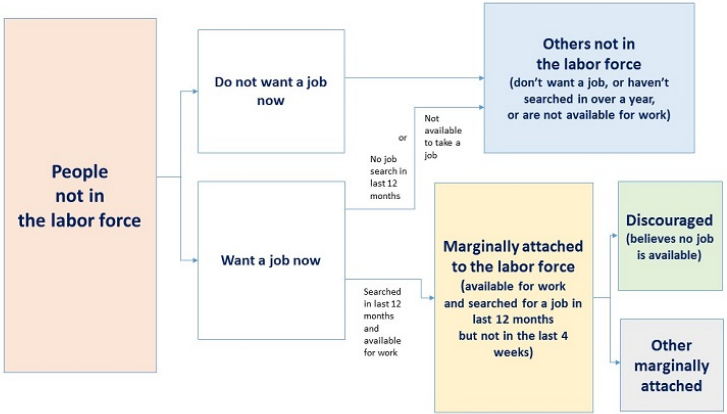


Not in the labor force = 50
- Not working AND
- Not actively looking for work in the past 4 weeks

Labor force = working-age population
– not in the labor force
= 100 – 50 = 50

BLS

- Official documents and definitions: https://www.bls.gov/cps/definitions.htm



Q5 - Unemployment rate

- U3: the headline/standard official unemployment rate

$$\text{U3 unemployment rate} = \frac{\text{Unemployed}}{\text{Labor Force}}$$

- U6: known as the "real" unemployment rate, broader than U3

$$\text{U6 unemployment rate} = \frac{\text{Unemployed} + \text{Marginally attached} + \text{Involuntary p.t. workers}}{\text{Labor Force} + \text{Marginally attached}}$$

- At work part time for economic reasons, also referred to as *involuntary part-time workers*
  - Economic reasons include: slack work, unfavorable business conditions, inability to find full-time work, and seasonal declines in demand.
  - To be classified as "part time for economic reasons", the worker must also indicate that they want and are available for full-time work.

Q2 (a)(b)(c)

- **Absolute advantage**: the ability of an individual, a firm, or a country to produce more of a good or service than competitors, **using the same amount of resources**
  $\rightarrow$ A.A. is about **productivity**, not total quantity produced
- **Comparative advantage**: The ability of an individual, a firm, or a country to produce a good or service at a **lower opportunity cost** than competitors
  $\rightarrow$ C.A. is more important for trade
  $\rightarrow$ Terms of trade should fall **between the opportunity costs** of the two countries to be mutually beneficial

Q2 (d) - Opportunity Cost

- **Method 1**: 1 worker can produce either 4 cars or 60 bushels of wheat.
  Therefore, O.C. of producing a car = 60 bushels of wheat / 4 = 15 bushels of wheat
- **Method 2:** in order to produce 1 more car, 1/4 worker has to give up producing wheat, which means 15 bushels of wheat ($60 \times 1/4$) will no longer be produced.
  Therefore, O.C. of producing a car = 15 bushels of wheat
- Similarly, O.C. of producing a bushel of wheat = 4 cars / 60 = 1/15 cars

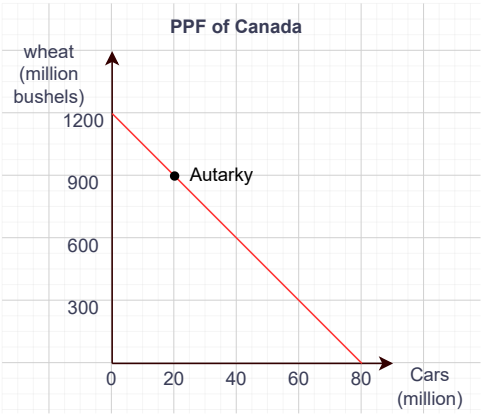
Q2 (e) - PPF

- **Method 1**: Assume L million workers produce cars, the remaining $(20 - L)$ million workers produce wheat $(0 \leqslant L \leqslant 20)$
  $\rightarrow$ Amount of cars produced: $C = 4L$ (unit: million)
  $\rightarrow$ Amount of wheat produced: $W = 60 \times (20 - L)$ (unit: million bushels)
  $\rightarrow$ $W = 60 \times (20 - C/4) \Rightarrow W = 1200 - 15C$, where $0 \leqslant C \leqslant 80$
- **Method 2**
  $\rightarrow$ Intercepts: 80 million cars (20×4) can be produced if all workers produce cars. 1200 million bushels of wheat (20×60) can be produced if all workers produce wheat
  $\rightarrow$ Slope: the opportunity cost of producing cars is constant, which implies a constant slope of PPF $\Rightarrow$ the PPF is a line segment on the graph

Q2 (e) - PPF

Canada consumes 20 million cars

- **Method 1**
  $W = 1200 - 15C$, $C = 20 \Rightarrow W = 900$
- **Method 2**
  5 million workers will produce 20 million cars (20/4), the remaining 15 million workers (20 - 5) can produce
  $15 \times 60 = 900$ million bushels of wheat
- **Method 3 (not recommended)**
  Draw a very accurate graph and read from the coordinates

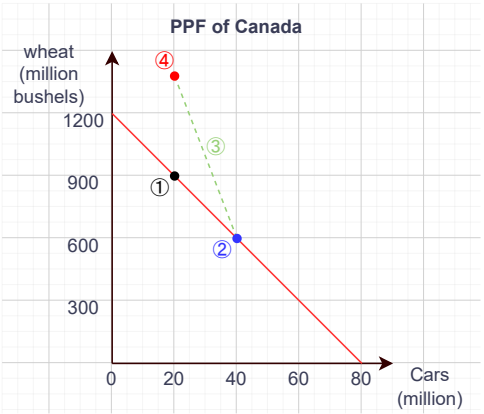


Q2 (f) - Trade

1. **Autarky**: (20 m. cars, 900 m. wheat)
2. **Specialization (partial)**: (40 m. cars, 600 m. wheat):
3. **Trade deal**: exchange 20 m. cars for 800 m. bushels of wheat (20×40)
4. **After trade)** (20 m. cars, 1400 m. wheat)

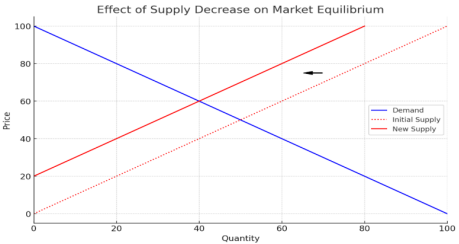
Canada should accept the deal because

- ④ is outside of PPF, or
- The terms of trade (40 wheat for 1 car) is higher than the O.C. of producing cars



Q3 - Demand and Supply

- Change of (P,Q) in the equilibrium is the **outcome** of the shifts in demand/supply curve, not the **cause**
- Price for apples is determined **endogenously** in the market for apples (but it can be an **exogenous** force that affects the market for bananas)
- Start from the initial equilibrium (P,Q) $\rightarrow$ under exogenous forces, supply decreases (the supply curve shifts leftward) and demand doesn't change $\rightarrow$ the market will reach a new equilibrium (P', Q'), where $P' > P$ and $Q' < Q$. $\Rightarrow$ END of the story!



Q4 - Growth Accounting

- Assuming GDP in 2024Q1 was X_1 trillion and in 2024Q2 was X_2 trillion, what was the growth rate of GDP from Q1 to Q2?

$$\text{Growth rate} = \frac{X_2 - X_1}{X_1} \times 100\%$$

- Assuming the growth rate of GDP from 2024Q1 to 2024Q2 was g%, GDP in 2024Q1 was Y_1 trillion, what was the GDP in 2024Q2?
  $\rightarrow$ Let's assume the GDP in 2024Q2 was Y_2 trillion, then by definition, we have

$$g\% = \frac{Y_2 - Y_1}{Y_1} \Rightarrow g\% \cdot Y_1 = Y_2 - Y_1 \Rightarrow Y_2 = Y_1(1 + g\%)$$

  $\rightarrow$ Therefore, the GDP in 2024Q2 was $Y_1(1 + g\%)$ trillion

Q4 - Growth Accounting

- Assuming GDP in 2024Q1 was T_1 trillion and in 2024Q3 was T_2 trillion, what was the **annualized** growth rate of GDP from Q1 to Q3?
- Assume the annualized growth rate is x%
  Step 1: calculate the growth rate $= \frac{T_2 - T_1}{T_1} \times 100\%$
  Step 2: list the equation

$$1 + x\% = (1 + \text{growth rate})^{\frac{4}{2}}$$

  $4 =$ number of quarters in the year (q)
  $2 =$ number of quarters between 2024Q1 and 2024Q3 (n)
  Step3: solve for x

$$x\% = (1 + \text{growth rate})^2 - 1 = (\frac{T_2}{T_1})^2 - 1$$

- You can also apply the formula on lecture slides directly

Midterm 1 Statistics

Count	134 test takers
Mean	65.52
Std. dev.	12.82
Median	68

Tips for making progress at this course

- Manage expectations
- Understand concepts and models using **real-life examples, intuition, math, and graphs**
- Take every probelm set seriously. Attend/schedule office hours.
- For exams: read the prompt carefully + memorize a few formulae if necessary