

Unit 9:
The Labor Market,
Wages, Profits, and Unemployment

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Introduction

Introduction

How is economy-wide wage and unemployment determined?

- Until now we are analyzing equilibrium in **goods market**.
- **Labor market** connects with firms' performance in goods market:
 - Goods market price high \Rightarrow firm earns profit \Rightarrow wage increases \Rightarrow more hiring \Rightarrow unemployment \downarrow \Rightarrow demand for good is higher, market price higher
- Since we have solved the goods market, we are going to use goods market result to solve the relationship between **wage** and **unemployment rate**:
 - wage-setting curve: relationship between firm and **employees**
 - price-setting curve: relationship between firm and **consumers**

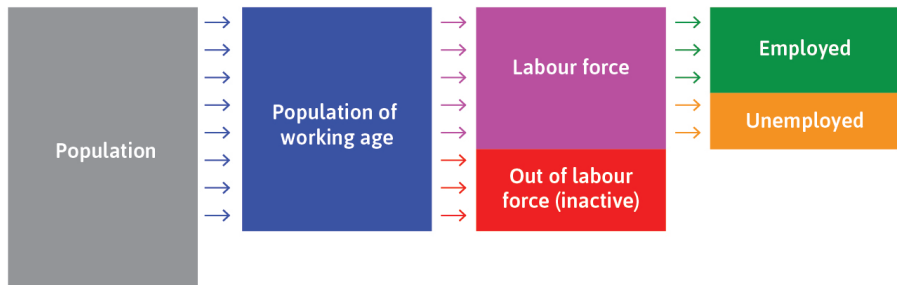
Measuring Unemployment

Unemployment Definition

The unemployed are the people who are not in **paid employment or self-employment**, **available** for work, and **actively seeking** work.

- not available for work: students, institutionalized, retired, children
- not actively seeking: not seeking for the 4 weeks (BLS)
- might subject to definition by researchers

Population Sections and Rate definition



- participation rate = $\frac{\text{labor force}}{\text{population of working age}}$
- unemployment rate = $\frac{\text{unemployed}}{\text{labor force}}$
- employment rate = $\frac{\text{employed}}{\text{population of working age}}$
- Why?! 😞

Price-Setting and Wage-Setting

Real Wage / Relative Price

The real wage is the nominal wage divided by the price level of the bundle of consumer goods purchased.

$$w = \frac{W}{P}.$$

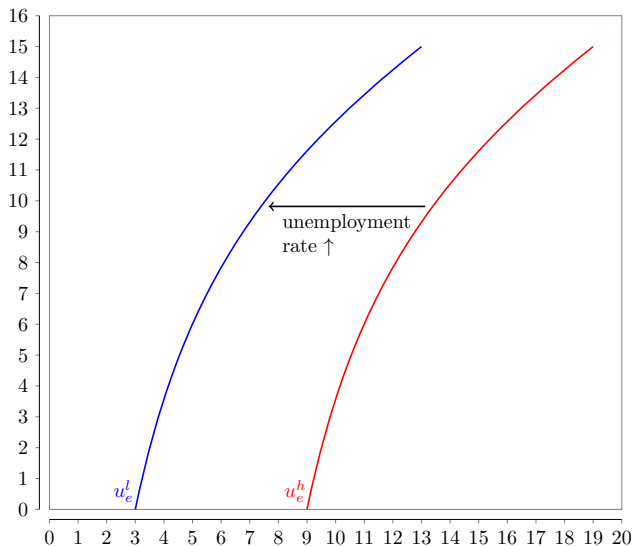
- ① each firm decides on its: price, wage, how many people to hire
- ② adding up all of these across all firms gives the total employment in the economy and the real wage

Firm's Decision

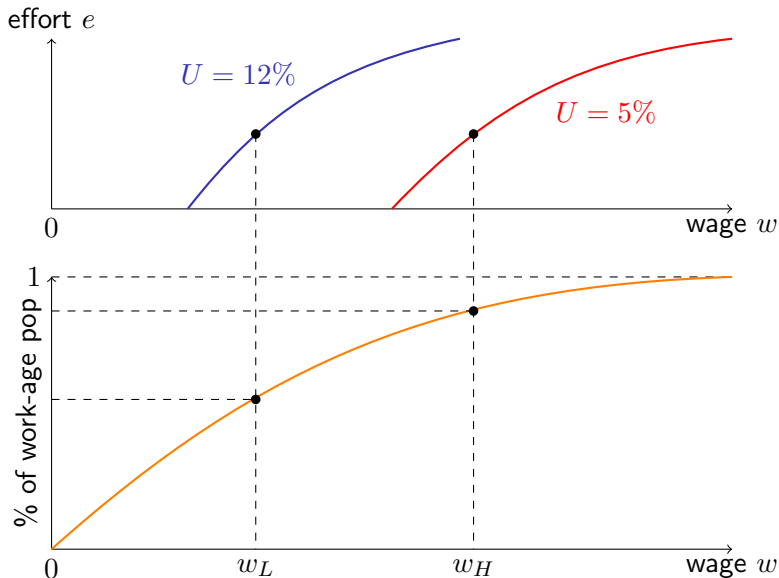
- Unemployment rate is the aggregated outcome of individual firms/workers' decisions.
- With labor discipline model, how does the reservation wage change with unemployment rate?
- **unemployment rate** $\uparrow \Rightarrow$ gov's unemployment benefit per person \downarrow , given fixed budget \Rightarrow **worker's reservation wage** \downarrow
- \Rightarrow shift worker's best response curve to the **left**

Shift in wage-setting curve

Worker's Best Response Curve with different unemployment rate



Aggregation for Wage-setting curve



Shift in wage-setting curve

more generous unemployment insurance scheme

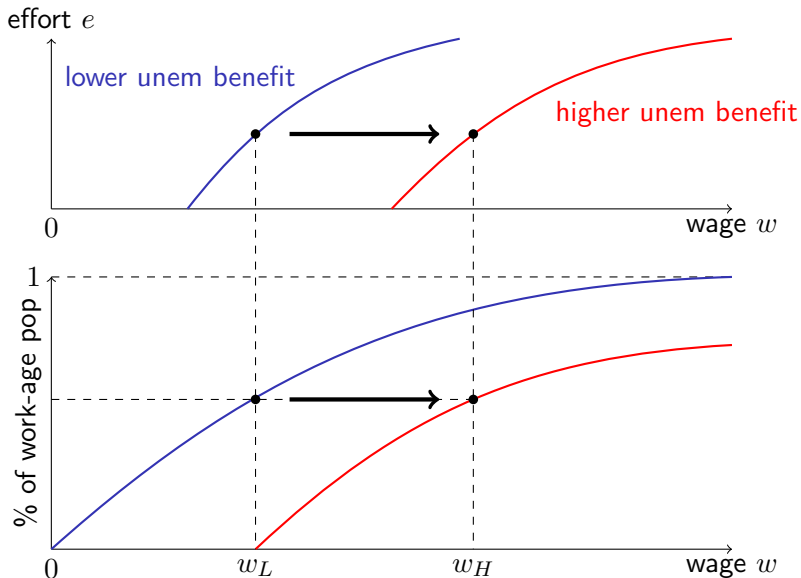
⇒ higher unemployment benefit

⇒ workers better off

⇒ best response curve shift **rightward/downward** ⇒ equilibrium wage is **higher**

⇒ wage curve shift **rightward/downward**.

Shift in wage-setting curve (Cont.)



Derivation of Price-setting curve

Algebra time 

- After assuming $MC = AC$ Func Form?, we can rewrite markup μ as

$$\mu = \frac{1}{\epsilon} = \frac{P - AC}{P}$$

- By definition unit labor cost, i.e., $AC = \frac{\text{nominal wage}}{\text{labor productivity}} = \frac{W}{\lambda}$, so

$$\begin{aligned} \mu &= \frac{P - AC}{P} = \frac{P - \frac{W}{\lambda}}{P} = 1 - \frac{\frac{W}{P}}{\lambda} \Rightarrow \frac{W}{P} = 1 - \mu \\ \frac{W}{P} &= \lambda(1 - \mu) = \lambda - \lambda\mu \end{aligned}$$

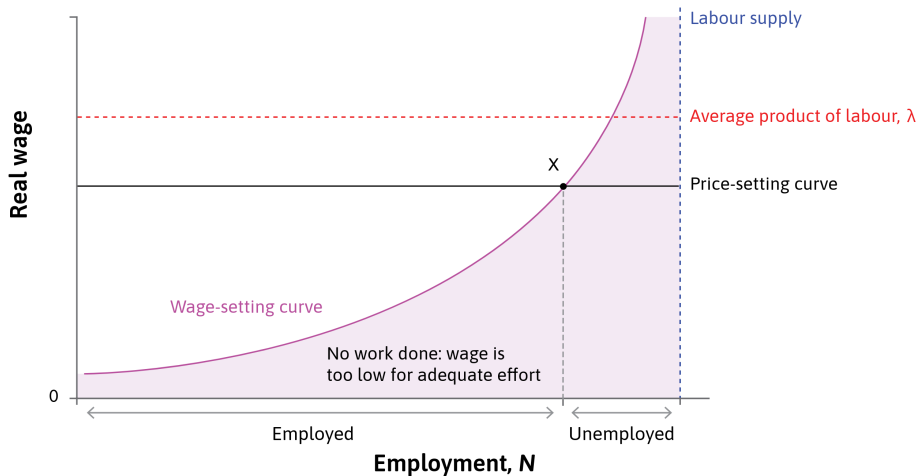
Thus, labor productivity λ is the pie shared by worker (W/P) and firm ($\lambda\mu$)

Price-setting curve

- Once **competitive** firm determined the optimal price by evaluating the cost (wage) and revenue (demand), individuals have **no impact** on economy-wise employment!
- \Rightarrow horizontal line!
- **The price-setting curve** is the real wage paid when firms choose their profit-maximizing price, depends on
 - ① competition, which determines markup
 - ② labour productivity, which determines real wage for given markup
- figures: <https://tinyurl.com/y9686h6m>

Labor Market Equilibrium

Labor Market Equilibrium



Labor Market Equilibrium: Each Agent Explained

All parties are doing the best they can, given what everyone else is doing:

- The firms are offering the least wage to ensure workers' effort
- Employment is the highest it can be, given the wage
- Those who have jobs cannot improve their situation by asking for higher pay or working less hard
- Those who do not have jobs would like to work, but cannot persuade firms to hire them by accepting lower wage (labour discipline concerns)

Involuntary unemployment

Unemployment = excess supply in the labour market

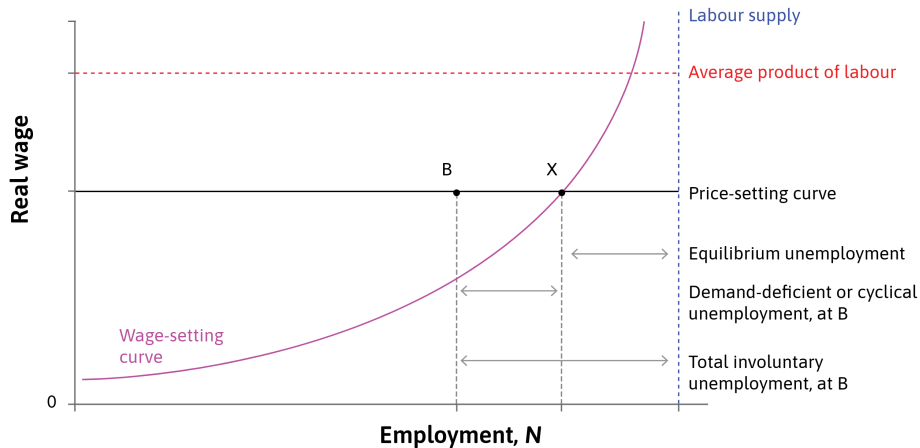
There will always be unemployment in labour market equilibrium

- No unemployment \rightarrow zero cost of job loss \rightarrow no effort
- Therefore some unemployment is necessary to motivate workers
- These are the involuntarily unemployed

Policy Implications

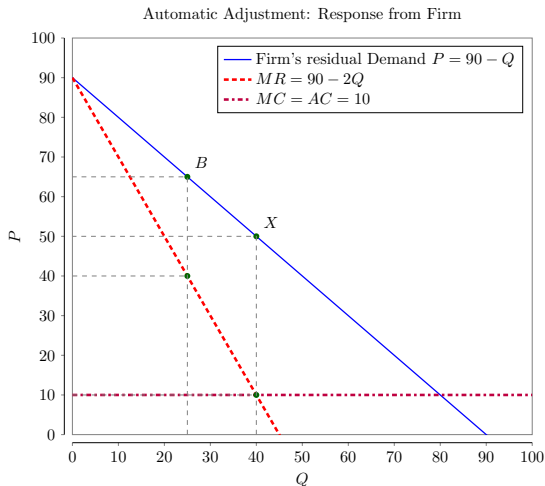
Demand-Deficient Unemployment: Model vs Real World I

The increase in unemployment caused by the **fall in aggregate demand** is called **demand-deficient unemployment**.



Demand-Deficient Unemployment: Model vs Real World II

- What should firm react?
(Remember we assume $MC = AC$)
- If we are at point B,
which means that prices
is too high



Demand-Deficient Unemployment: Model vs Real World III

- Firms could lower wages without lowering workers' effort
- Lower wages allow them to cut their prices
- Lower prices stimulate demand → output rises
- Firms hire more workers to produce more
- ... unemployment falls back to X

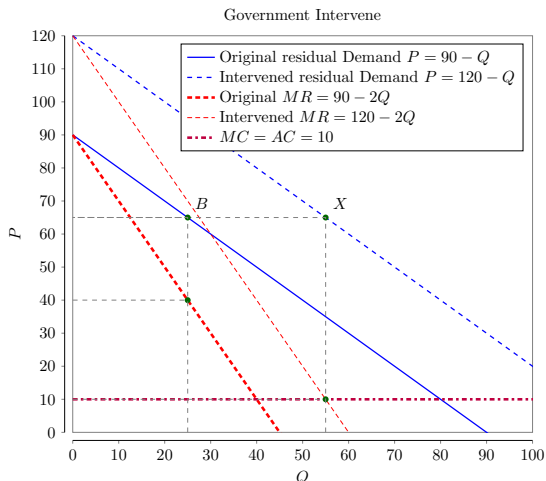
Demand-Deficient Unemployment: Model vs Real World IV

Real economies do not function so smoothly:

- Workers resist cuts to their nominal wage (lower morale, strikes)
- Lower wages means people spend less → aggregate demand falls further
- Falling prices across the economy may lead consumers to postpone their purchases in hope to get even better bargain later

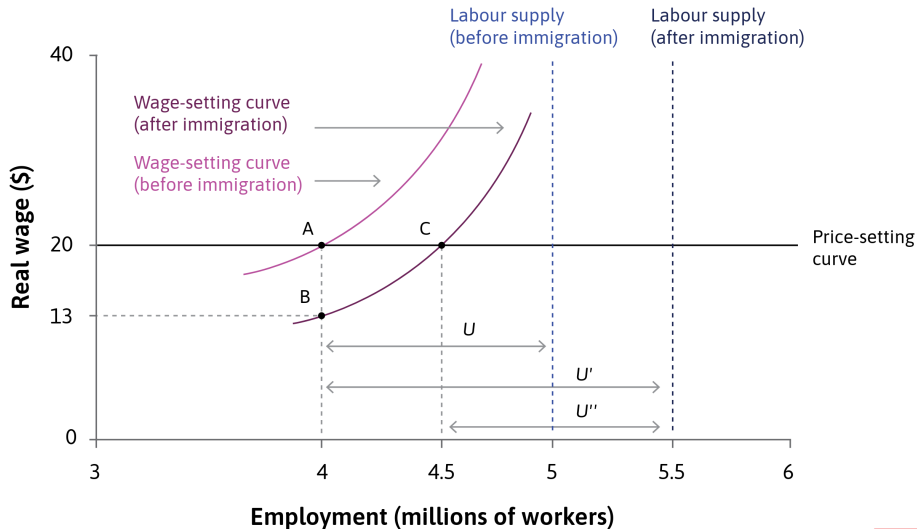
Government intervention

The government could increase its own spending (monetary & fiscal policy) to expand aggregate demand. At B, firms would find it optimal to **produce more** (and hire more workers) instead of reducing wages.



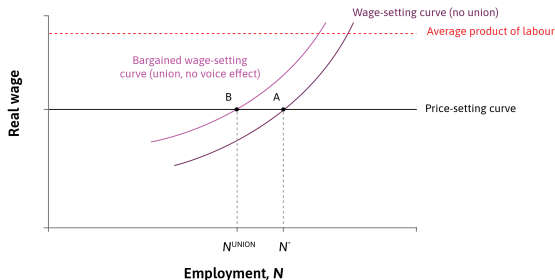
Immigration

Figures: <https://tinyurl.com/yr43j9v9>



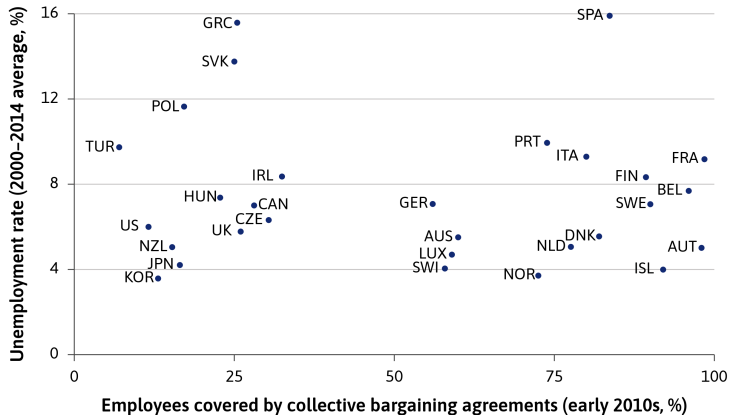
Labor Union: Model vs Real World I

- Labor union is an organization consisting predominantly of employees. Its main activities include the negotiation of rates of pay and conditions of employment for its members.
- Bargaining power of worker $\uparrow \Rightarrow$ wage-setting curve shift **left** \Rightarrow unemployment rate \uparrow



Labor Union: Model vs Real World II

- But data says the opposite:



Labor Union: Model vs Real World III

Why? Textbook says the **union voice effect**: Providing employees with a voice in how decisions are made may induce them to provide **more effort** for the same wage.

Really? \(\text{☺}\)

Summary for Policies

- Shifts in the price-setting curve:
 - ① Education & training: labour productivity \uparrow
 - ② Wage subsidy: Production costs and prices \downarrow
- Shifts in the wage-setting curve:
 - ① Lower unemployment benefit: reservation wage \downarrow
- Shifts in labour supply curve:
 - ① immigration policies: labour supply \uparrow
 - ② childcare provision: female labour participation \uparrow

Appendix

What functional form of cost function allow $MC = AC$?

Back

The general form of cost function is $C(Q) = aQ^b + c$, so to make $MC(Q) = AC(Q)$, we need

$$\begin{aligned}MC(Q) &= AC(Q) \\ \frac{\partial C(Q)}{\partial Q} &= \frac{C(Q)}{Q} \\ abQ^{b-1} &= aQ^{b-1} + \frac{c}{Q}\end{aligned}$$

So the easiest way to force $MC = AC$ is unsurprisingly, $b = 1$ and $c = 0$, i.e., a flat line.

