Supply and Demand for Labor

ECO 120: Global Macroeconomics

Goals

Unit Goals

- Define labor demand and identify what influences labor demand
- Define labor supply and identify what influences labor supply
- Predict how wages and level of employment are determined by labor supply and demand.
- Use these skills to make predictions about changes in wages and employment.

Reading and Exercises

- External reading on Canvas: Greenlaw and Shapiro, *Principles of Economics 2e*, Chapter 4
- **Canvas Quiz due Wednesday 11:59 PM**.
  Multiple-choice, 15 questions, unlimited attempts allowed, only best score counts
- **Homework/In-class Exercise due Thursday 11:59 PM**. We will work together in class on Thursday.

Demand

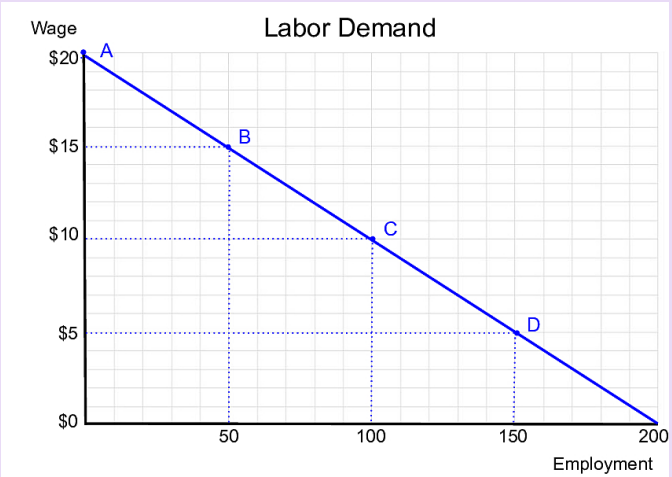
- In the market for labor, the price of labor is the **wage**, and the quantity of labor is **total hours of employment**
- The **quantity of labor demanded** is the amount of worker time that **employers** are willing and able to hire in a given time period at a particular wage.
- Labor demand follows the **law of demand**: All other things remaining equal, the higher is the wage, the lower is the quantity of labor demanded.

Demand

Labor Demand Schedule

Point	Wage	L_D
A	\$20	0
B	\$15	50
C	\$10	100
D	\$5	150

Labor Demand Curve



- Law of demand makes the labor demand curve **downward sloping**.
- **Change in quantity labor demanded**: when there is a **change in wage** causing a **movement** from one point on the labor demand curve to another point.

Supply

- The **quantity of labor supplied** is the number of total hours **people** are willing and able to work in a given time period at a given wage.
- Labor supply follows the **law of supply**: All other things remaining the same, the higher is the wage, the higher is the quantity of labor supplied

Supply

Labor Supply Schedule

Point	Wage	L_S
A	\$20	160
B	\$15	130
C	\$10	100
D	\$5	70

Labor Supply Curve



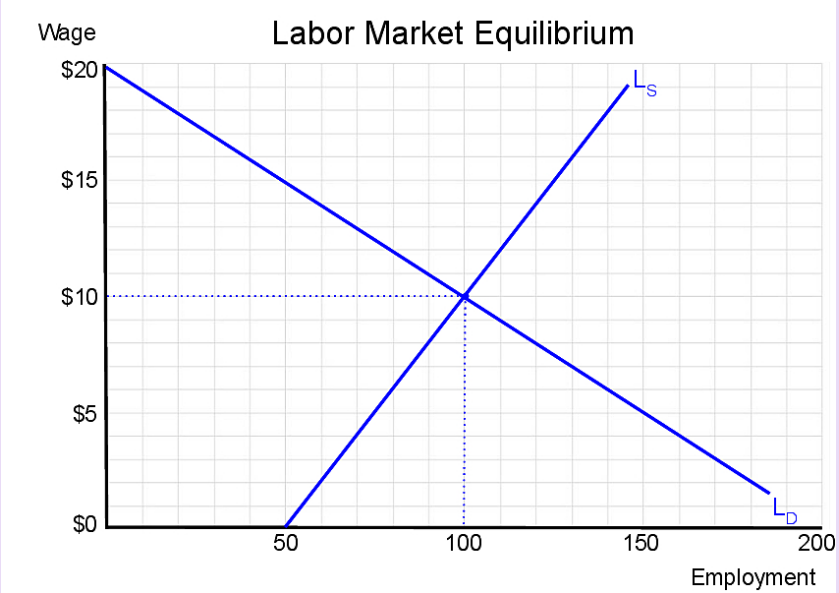
- Law of supply makes the labor supply curve **upward sloping**.
- **Change in quantity of labor supplied**: when there is a **change in wage** causing a **movement** from one point on the labor supply curve to another point.

Equilibrium

Equilibrium Definition

- The **equilibrium wage** is the wage where the quantity of labor supplied is equal to the quantity labor demanded.
- The **equilibrium employment** is the corresponding quantity of labor.
- This is the wage and level of employment that should prevail in the long-run in the labor market

Graphical Equilibrium

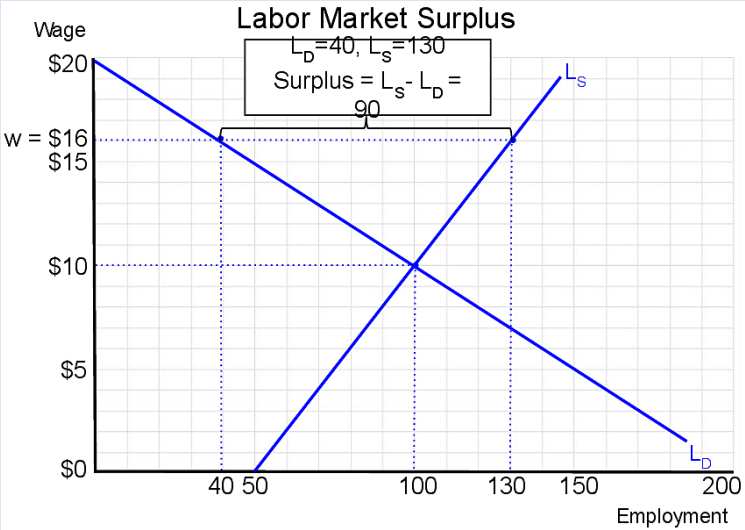


Labor Surplus is Unemployment

Labor Surplus Definition

- When the prevailing wage is **above** equilibrium wage, L_S exceeds L_D
- Quantity of labor supplied $\equiv$ people who want work
- Quantity of labor demanded $\equiv$ how much labor employers want to hire
- Difference = surplus = unemployment
- In an unregulated market, market forces will push wage lower toward equilibrium

Graphical Surplus

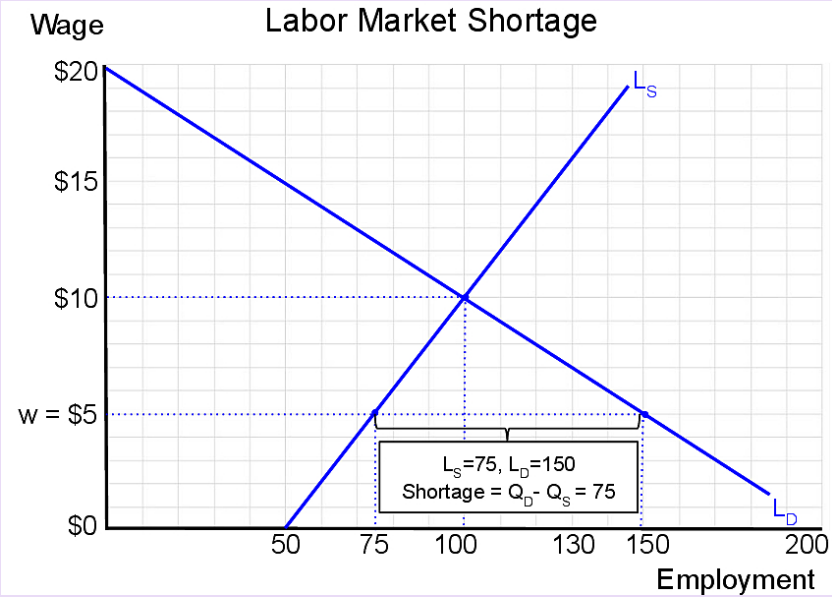


Shortage

Labor Shortage Definition

- When the prevailing price is **below** equilibrium price, quantity demanded exceeds quantity supplied
- Difference is the shortage
- In an unregulated market, market forces will push equilibrium price higher

Graphical Shortage

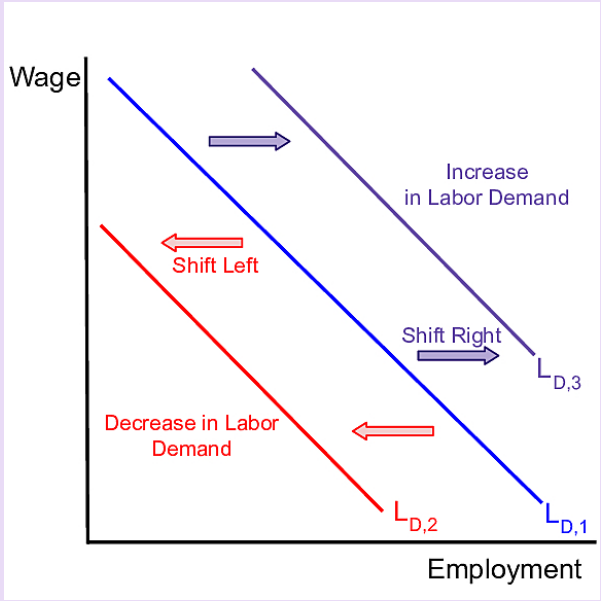


Labor Demand Curve Shifts

Shifts in Whole Demand Curve

- When something *besides the wage* effects labor demand, we say there is a *change or shift in labor demand*.
- Something that **increases** labor demand shifts the labor demand curve to the **right**
- Something that **decreases** labor demand shifts the labor demand curve to the **left**

Shifts in Labor Demand

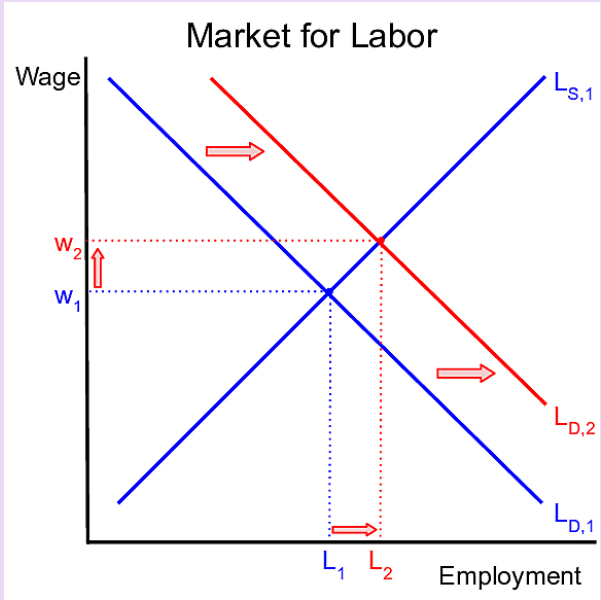


Improvement In Labor Productivity

Mechanism

- If labor productivity improves, workers can produce more goods and services per hour of work
- This generates more revenue for firms per hour of work hired
- This will **shift labor demand right**
- Equilibrium wage increases, employment increases
- Improvements in technology can improve labor productivity **at an aggregate level**

Graphical Equilibrium



Spotlight: Daron Acemoglu & Pascual Respreto

Automation and New Tasks: How Technology Displaces and Reinstates Labor, *Journal of Economic Perspectives*, Spring 2019.

Displacement + New Tasks

- *Displacement effect:* Automation decreases in demand for labor, increases demand for capital
- *Productivity effect:* Automation leads to creation of new tasks, increase labor demand
- Stagnation in labor demand in last decade due to the displacement effect
- No one effect always dominates the other

About the Scholars





Dr. Daron Acemoglu (left)
Professor of Economics
Massachusetts Institute of Technology

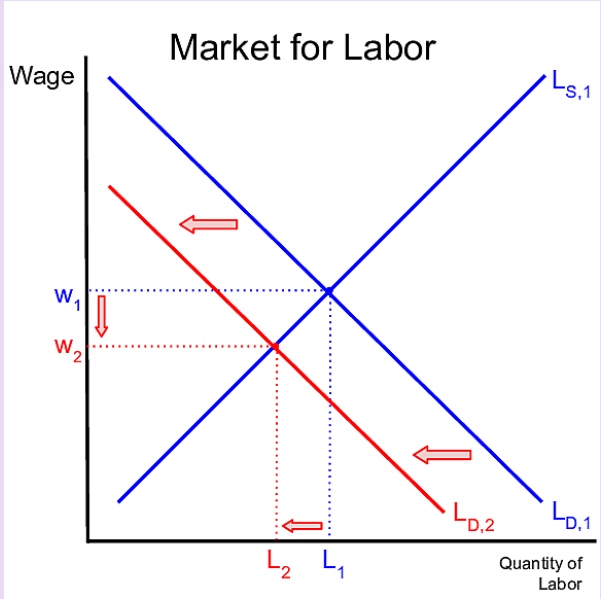
Dr. Pascual Restrepo (right)
Asst Professor of Economics
Boston University

Destruction of Capital Stock

Mechanism

- Capital complements labor and makes labor more productive
- Suppose a natural disaster leads to a destruction of capital stock
- Less capital stock leads to lower labor productivity and lower labor demand
- This will **shift labor demand left**
- Equilibrium wage decreases, employment decreases

Graphical Equilibrium

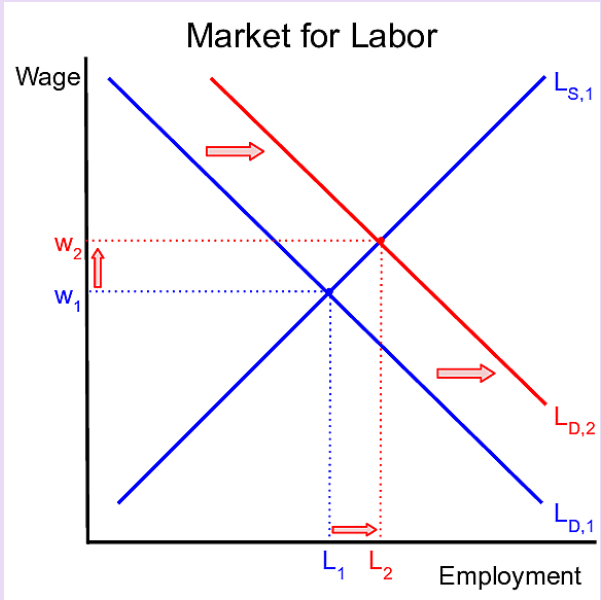


Increase in Demand for Goods and Services

Mechanism

- Labor is a **derived demand**, demand depends positively on the demand for the goods and services the workers produce
- Suppose consumer demand for goods and services increases
- This will **shift labor demand right**
- Equilibrium wage increases, employment increases

Graphical Equilibrium



Scholar Spotlight: Kerwin Kofi Charles

Housing Booms, Manufacturing Decline, and Labor Market Outcomes
Economic Journal, 2018,(with E. Hurst and M. Notowidigdo)

Offsetting Effects

Manufacturing 2000-2006:

- Automation and international trade decreased demand for manufacturing employment

Housing Boom 2000-2006:

- Increased demand for housing
- Temporary increased demand construction labor

Without housing boom: employment declines would've been larger and earlier

About the Scholar



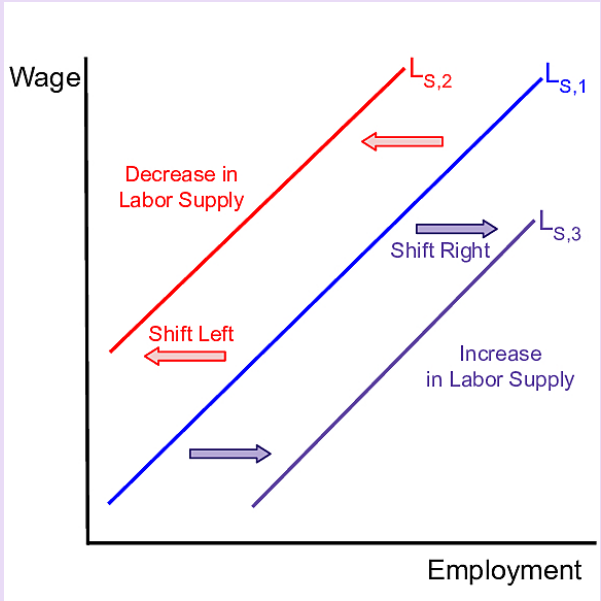
Dr. Kerwin Kofi Charles
Dean and Professor of Economics
Yale School of Management

Supply Curve Shifts

Shifts in Whole Supply Curve

- When something *besides the wage* affects how much people are willing and able to work, we say there is a *change or shift in labor supply*.
- Something that **increases** labor supply shifts the labor supply curve to the **right**
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Shifts in Labor Supply

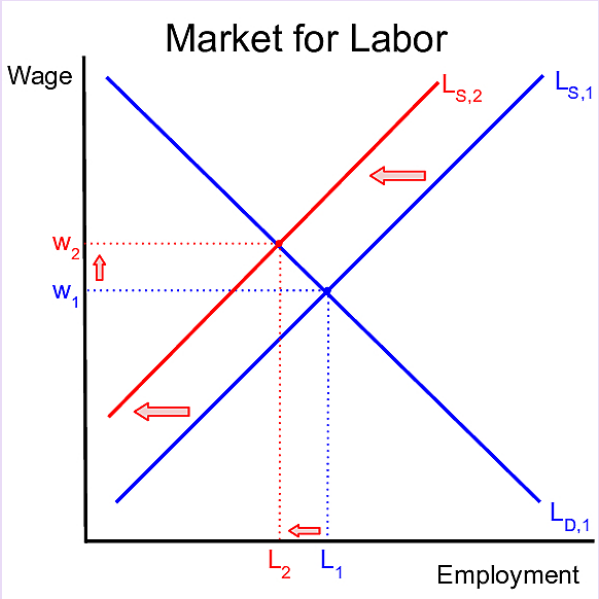


Increase in Retirements

Mechanism

- Suppose a healthy stock market causes more people to decide to retire
- This will **shift labor supply left**
- Equilibrium wage increases, employment decreases

Graphical Equilibrium

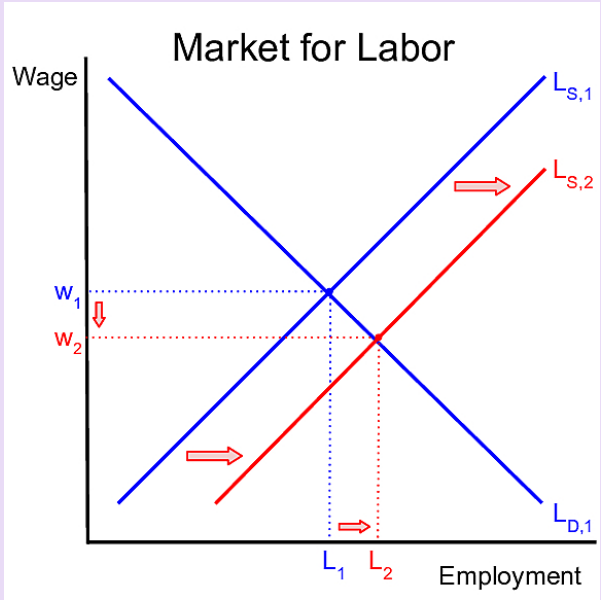


Increase in Labor Force Participation

Mechanism

- U.S. labor force participation rate is about 62.5% (2024)
- Suppose more people decide to be part of the labor force
- This will **shift labor supply right**
- Equilibrium wage decreases, employment increases

Graphical Equilibrium



Sticky Wages

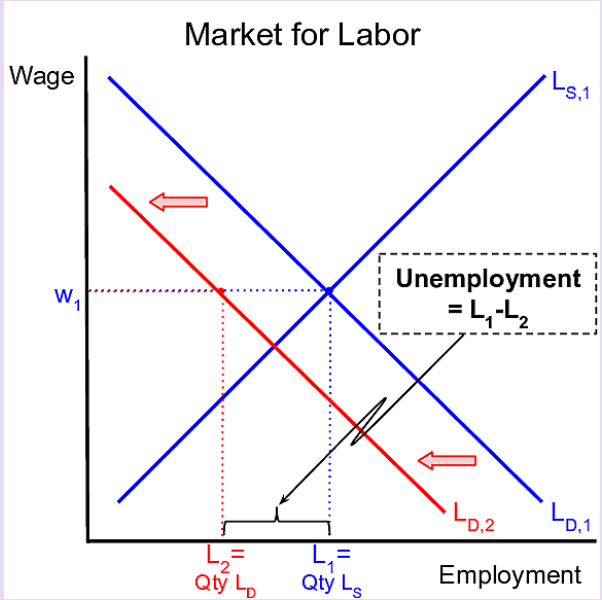
- Usually, wages do not quickly adjust to new equilibrium levels
- Employers are hesitant to change wages until they recognize market wages have permanently changed
- Labor contracts, policies, salaries often negotiated and changed annually
- Across the board paycuts can hurt employee morale more than layoffs
- Wages can take 3 months - 12 months to adjust to new equilibrium levels

Unemployment with Sticky Wages

Drop in Consumer Spending

- Suppose drop in consumer confidence leads to a drop in consumer spending
- Labor is a derived demand, so **labor demand shifts to the left**
- When wage does not move to new equilibrium level, labor market surplus is created
- Labor market surplus → unemployment

Graphical Illustration

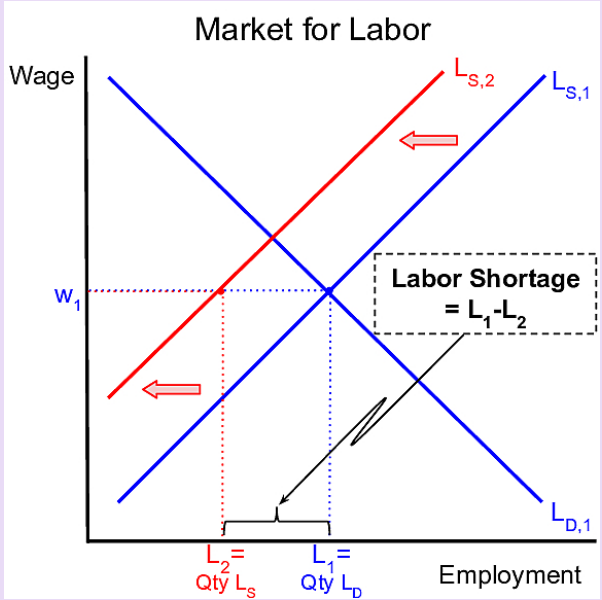


Labor Market Shortage with Sticky Wages

Drop in Labor Force Participation

- Following the COVID recession in 2020, labor force participation dropped from 63% to 61.5%
- NPR Story: Record number of job resignations in 2021
- **Labor supply shifts to the left**
- When wage does not move to new equilibrium level, labor market shortage is created

Graphical Illustration



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