# Factor Markets

AP Economics | June 19, 2014 | Grant Black





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# Introduction

- Factors of production and factor markets
- Factor income
- Derived demand for factors of production
- Productivity theory and factor markets
  - Marginal revenue product
  - Marginal resource cost
  - Profit maximization

# Introduction

- Productivity theory and factor markets
  - Effect of imperfect competition in product markets
  - Effect of imperfect competition in labor markets
  - Monopsony
- Problems with productivity theory in factor markets
- Government intervention in factor markets: minimum wage

# Factors of Production

- Any resource used to produce goods and services
  - Labor
  - Land and other natural resources
  - Capital (physical and human)
- Factors of production earn income from the ongoing selling of their services
- **Factor markets** = markets where factors of production are traded
  - Households are suppliers
  - Firms are demanders

# Importance of Factor Markets

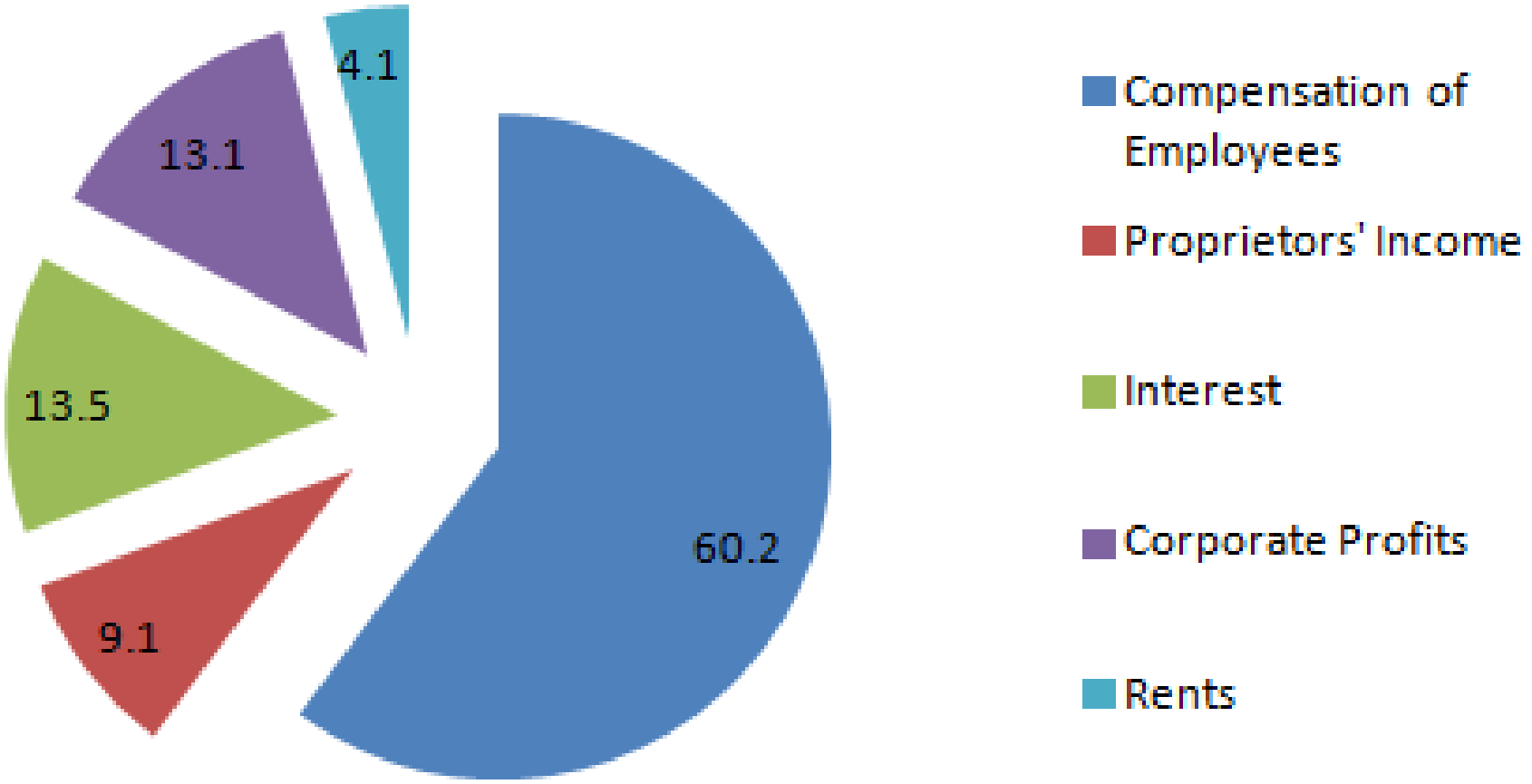
- Determine prices of resources
- Allocate productive resources to producers
- Help ensure resources are used efficiently

# Factor Income

- Sale of factors of production usually generates largest share of most people's incomes

- **Factor distribution of income** = how total income in the economy is divided among labor, land, and capital

# Factor Distribution of Income, 2014




Source: Bureau of Economic Analysis

# Derived Demand for Factors of Production

- Demand for a factor of production is derived from demand for the good/service produced from that resource

- Distinguishes factor markets from goods markets

# Productivity Theory and Factor Markets

- Initially assume product market and resource market are both perfectly competitive
- Use labor market as example
- **Marginal revenue product** (MRP) = change in total revenue resulting from a change in the quantity of labor
  - Also called value of marginal product (VMP)

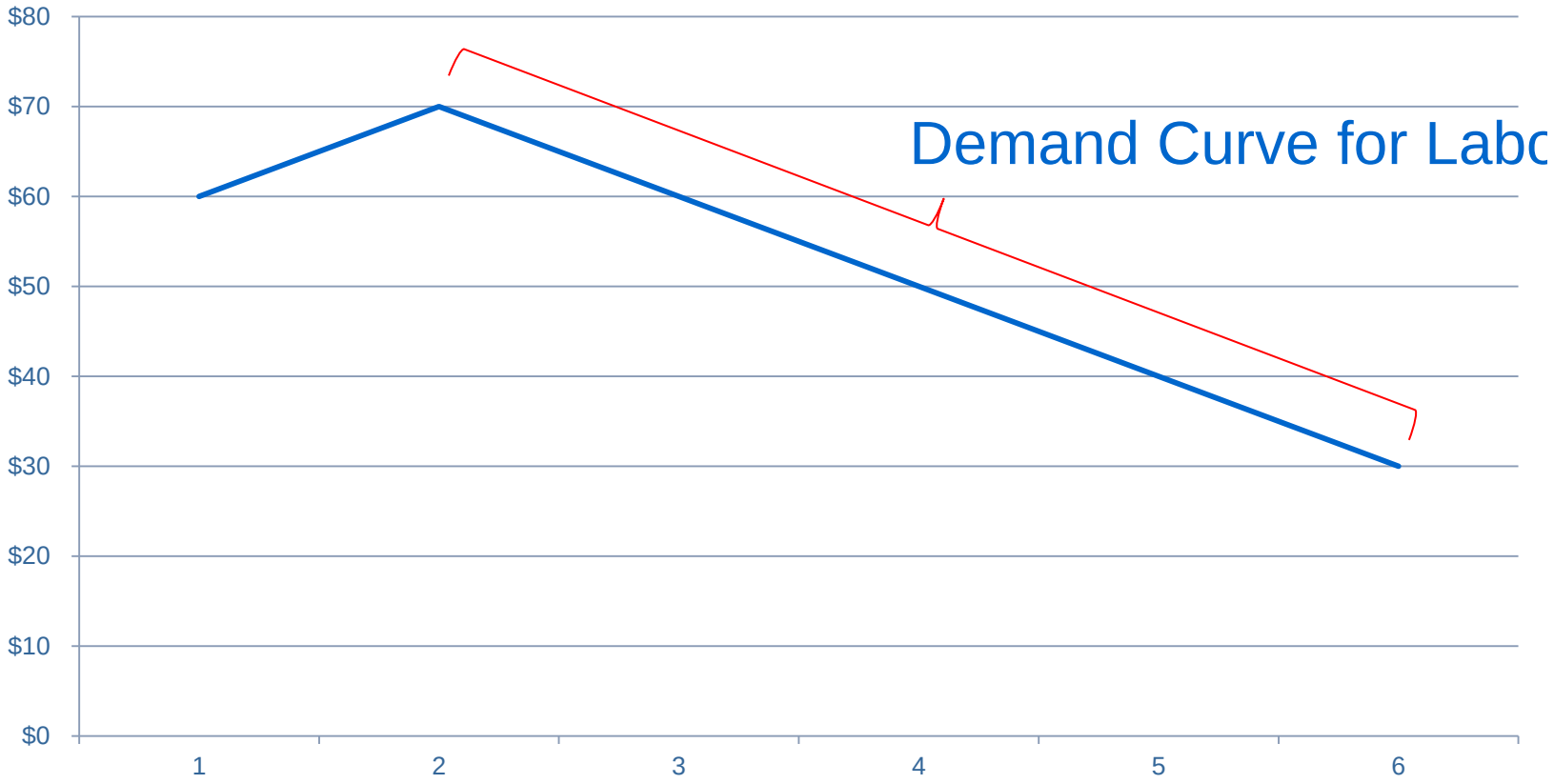
# Marginal Revenue Product

- MRP = $\Delta TR / \Delta Q_L = (TR_{new} - TR_{old}) / (Q_{L_{new}} - Q_{L_{old}})$
- If factor market is competitive, MRP = MPL x P (product price)
- MRP curve represents a firm's demand for labor
  - Downward sloping due to diminishing returns to labor

# MRP Example

| $Q_L$ | TP (output) | MPL | P | TR | MRP |
|---|---|---|---|---|---|
| 1 | 12 | 12 | $5 | $60 | $60 |
| 2 | 26 | 14 | $5 | $130 | $70 |
| 3 | 38 | 12 | $5 | $190 | $60 |
| 4 | 48 | 10 | $5 | $240 | $50 |
| 5 | 56 | 8 | $5 | $280 | $40 |
| 6 | 62 | 6 | $5 | $310 | $30 |

# MRP Curve




- MRP affected by diminishing returns to labor

# Marginal Resource Cost

- **Marginal resource cost** (MRC) = change in total cost resulting from a change in the quantity of labor

- $MRC = \Delta TC / \Delta Q_L = (TC_{new} - TC_{old}) / (Q_{L_{new}} - Q_{L_{old}})$

- If factor market is competitive, MRC = wage (w)

# Profit-maximizing Quantity of Labor

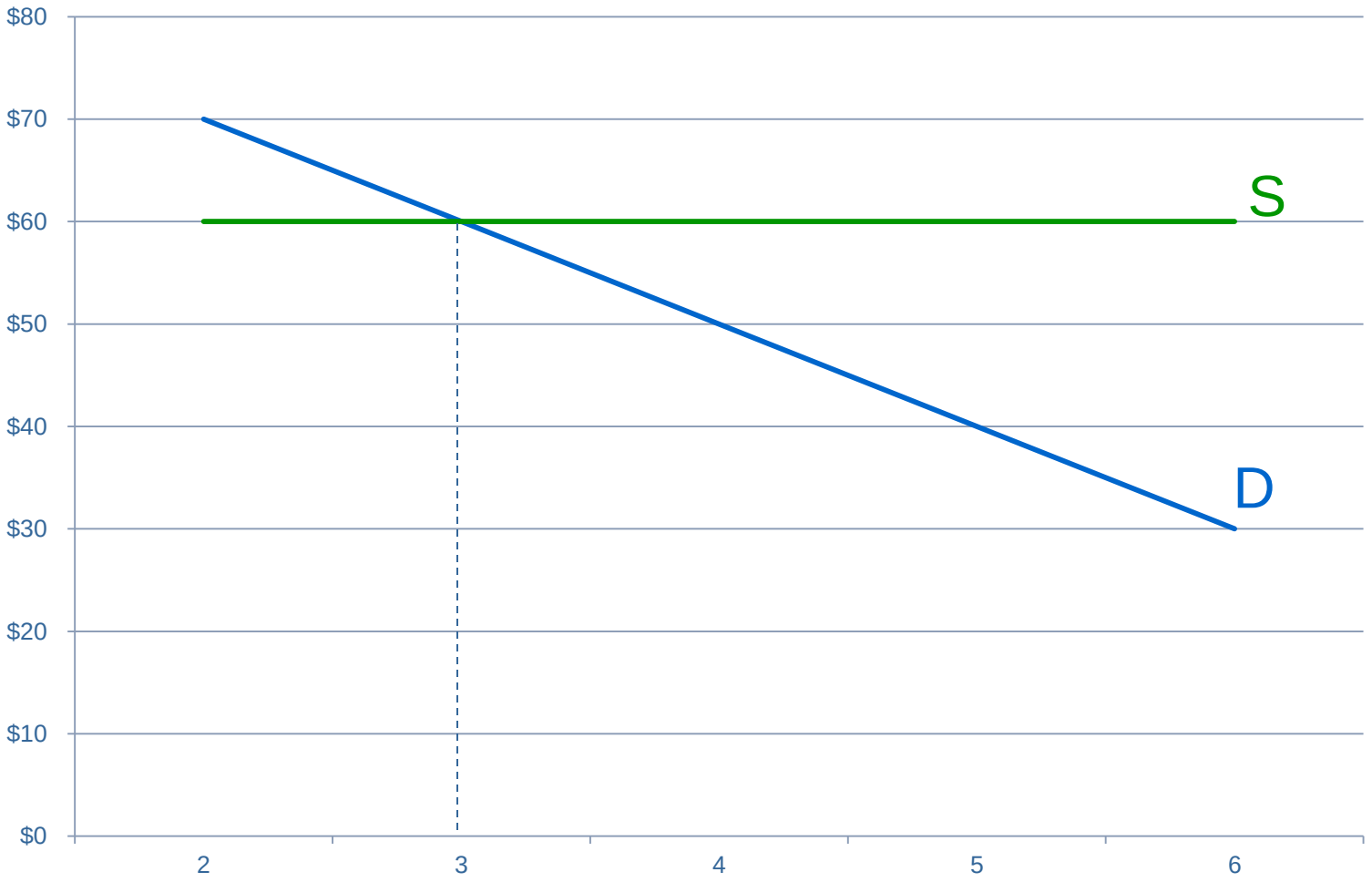
- Similar to determining profit-maximizing quantity of output
  - MR = MC
- Maximizing rule: MRP = MRC
- If factor market is competitive, MRP = w

# Profit-maximizing Example

| $Q_L$ | TP (output) | MPL | P | TR | MRP |
|---|---|---|---|---|---|
| 1 | 12 | 12 | $5 | $60 | $60 |
| 2 | 26 | 14 | $5 | $130 | $70 |
| **3** | 38 | 12 | $5 | $190 | $60 |
| 4 | 48 | 10 | $5 | $240 | $50 |
| **5** | 56 | 8 | $5 | $280 | $40 |
| 6 | 62 | 6 | $5 | $310 | $30 |

- If wage = $60, profit-maximizing quantity of labor is 3 workers
- If wage = $40, profit-maximizing quantity of labor is 5 workers

# Demand and Supply Model



# Demand and Supply Model

# Effect of Imperfectly Competitive Product Markets

| $Q_L$ | TP (output) | MPL | P | TR | MRP |
|---|---|---|---|---|---|
| 1 | 12 | 12 | $5.80 | $67.20 | $67.20 |
| 2 | 26 | 14 | $5.60 | $140.40 | $73.20 |
| 3 | 38 | 12 | $5.40 | $197.60 | $57.20 |
| 4 | 48 | 10 | $5.20 | $240.00 | $42.40 |
| 5 | 56 | 8 | $5.00 | $268.80 | $28.80 |
| 6 | 62 | 6 | $4.80 | $285.20 | $16.40 |

- If wage = $60, profit-maximizing quantity of labor is 2 workers
- If wage = $40, profit-maximizing quantity of labor is 4 workers

# Effect of Imperfectly Competitive Labor Markets

- Case of monopsony
  - **Monopsony** = single demander of labor
  - Classic example: one-company town
  - Other examples:
    - local fire department (one employer demands workers with certain skills)
    - Major league baseball (reserve clause limited player mobility)

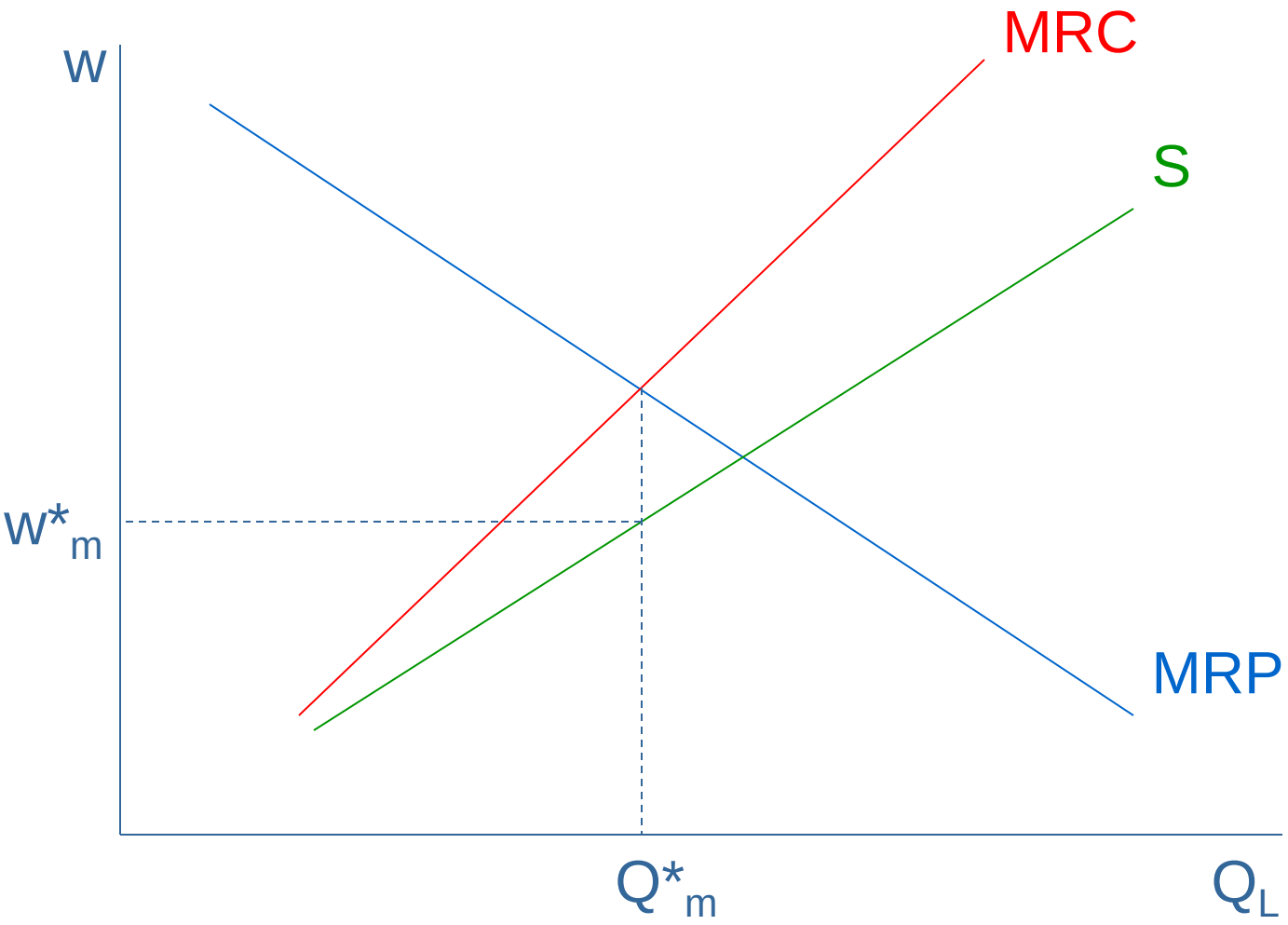
- To hire more workers, business must offer higher wage
  - MRC curve is upward sloping

# Profit Maximization in Monopsony

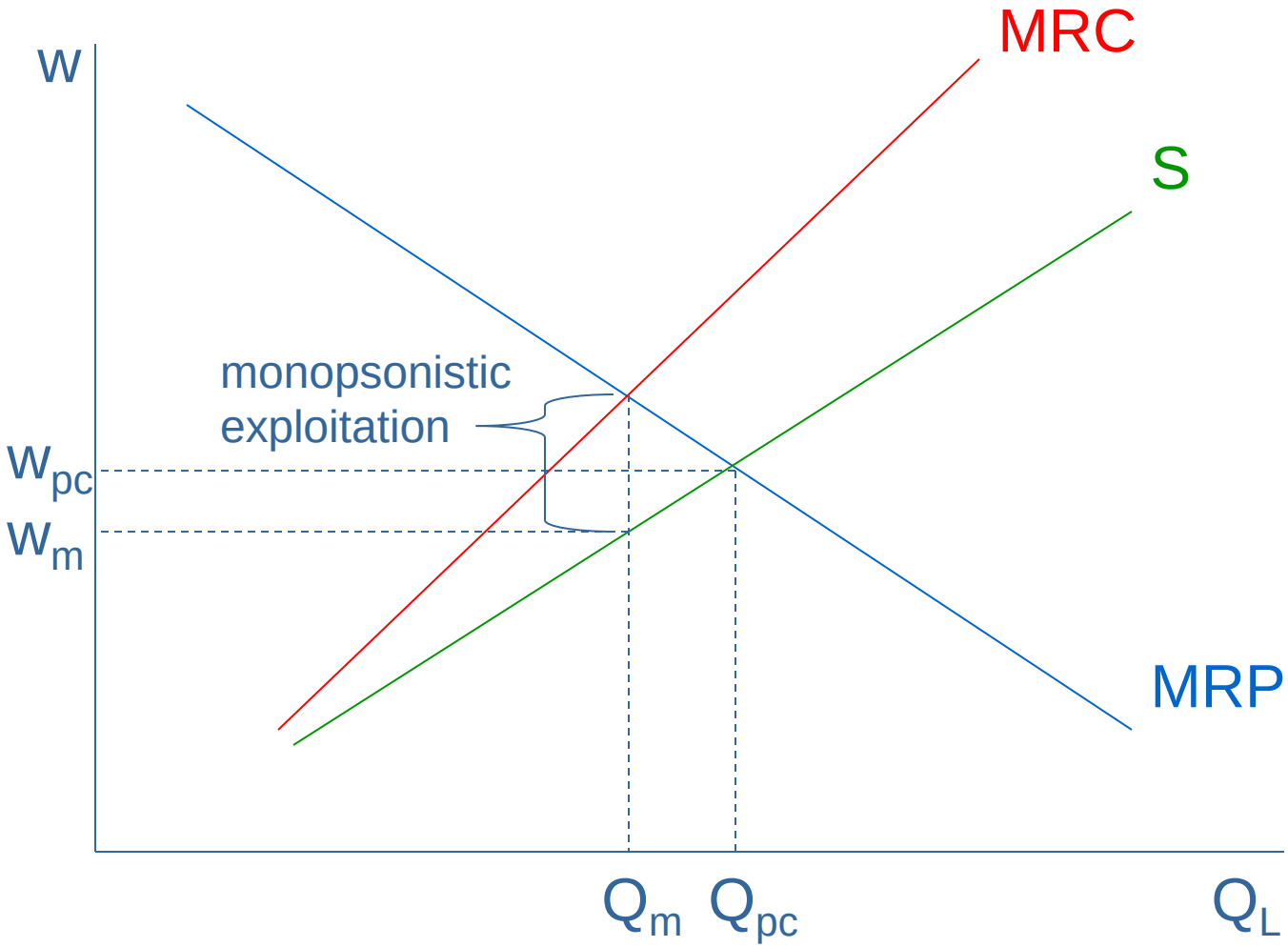
- Monopsony still maximizes profits when hiring at MRP = MRC

- For monopsony, MRC > w
  - MRP=w does not apply for monopsony as in perfect competition

# Monopsony Model



# Monopsony vs. Perfect Competition



# Problems with Productivity Theory in Factor Markets

- In real world, substantial differences exist between prices of factors that likely have similar MRP
  - Wage gaps by gender and race
- In real world, some resources are not fully employed and may receive prices higher than their MRP or market-clearing levels

# Median Weekly Earnings by Gender and Race, 2014

| White Men | Women (all races/ethnicities) | African American (men and women) | Hispanic (men and women) |
|---|---|---|---|
| $948 | $754 | $682 | $651 |

*For those aged 25 and over
Source: Bureau of Labor Statistics

# Causes of Wage Differentials and High Wages

- Wage differences may result from compensating for “unattractive” jobs, differences in innate talents, and differences in human capital
  - Productivity theory can account for these issues
- Market power
  - Unionization can push wages above market-clearing levels and above wages in non-unionized sectors

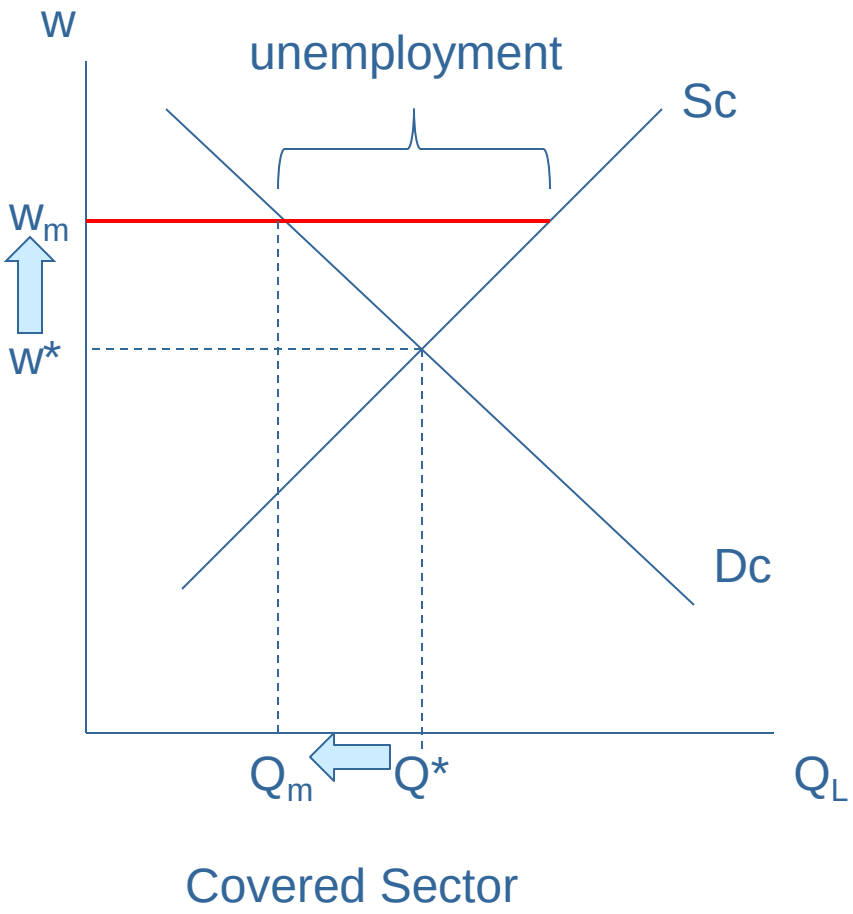
# Causes of Wage Differentials and High Wages

- Efficiency wages
  - In jobs where workers cannot be supervised easily, wages are above equilibrium to promote higher productivity of workers, which can create wage dispersion and unemployment
- Discrimination
  - Some workers may be discriminated against, which lowers their wages relative to other workers and their employment opportunities

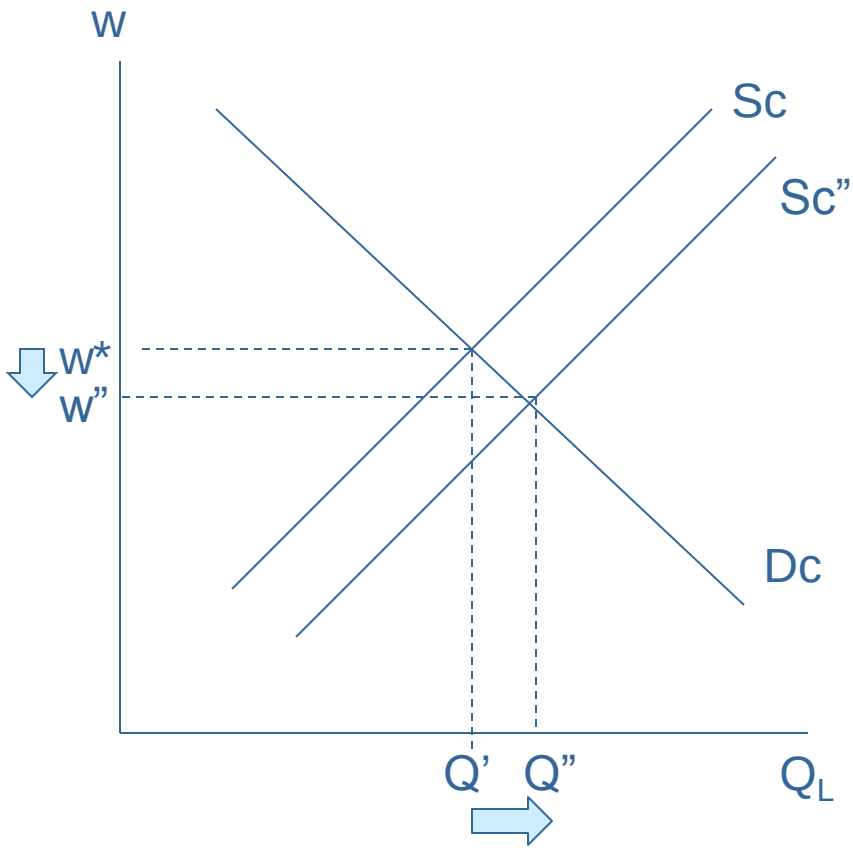
# Government Intervention: Minimum Wage

- Purpose: increase earnings of low-income workers
- Predicted simple outcome: increase in wage above equilibrium causes unemployment for some and higher wages for those still employed
- Negative effect depends in part on elasticity of demand for labor and structure of labor market
  - More inelastic, less unemployment
  - Perfectly competitive vs. monopsonistic

# Minimum Wage in Perfect Competition

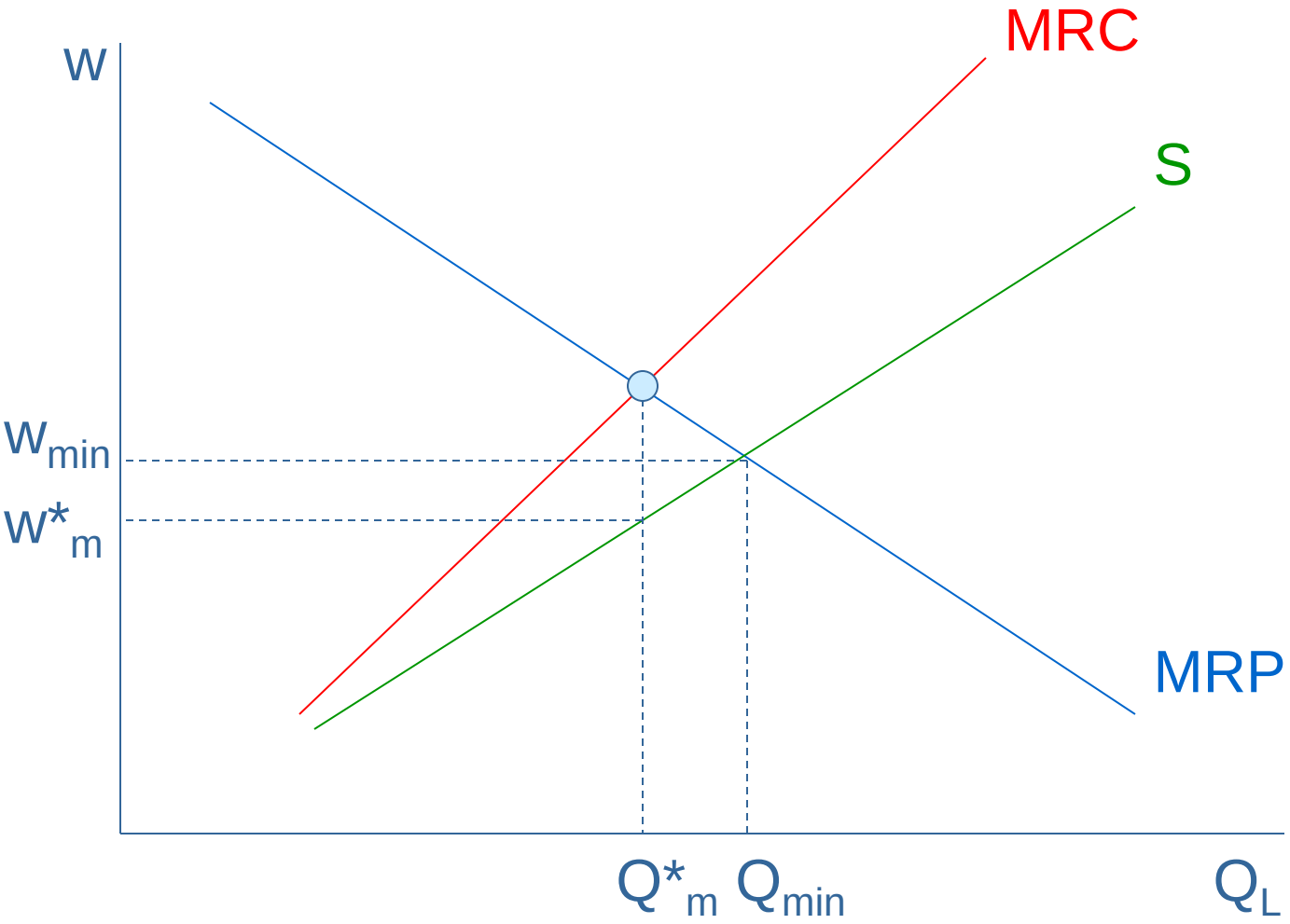



Covered Sector




Uncovered Sector

# Minimum Wage in Monopsony



# Wrap Up

Questions?

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