Chapter 6

Wage Determination and the Allocation of Labor
1. Theory of a Perfectly Competitive Labor Market
Perfectly Competitive Labor Market

- Perfectly competitive labor markets have the following characteristics:
  - Large number of firms trying to hire an identical type of labor.
  - Numerous qualified people independently offering their services.
  - Neither firms nor workers have no control over the market wage.
  - Perfect, costless information and labor mobility
Market Labor Supply

- Though individuals have backward-bending labor supply curves, market supply curves are usually positively sloped over normal wage ranges.
- High relative wages attract workers away from household production, leisure, or their previous jobs.
- The height of the market supply curve measures the opportunity cost of using the marginal labor hour in this employment.
- The shorter the time period, the less elastic is the labor supply curve.
Wage and Employment Determination

- The equilibrium wage rate $W_0$ and level of employment $Q_0$ occur at the intersection of labor supply and demand.
- An excess demand of $Q_2 - Q_1$ would occur at a wage rate of $W_{ed}$.
- An excess supply of $Q_2 - Q_1$ would occur at a wage rate of $W_{es}$. 
Labor Supply Determinants

- Other wage rates
  - If wages in other occupations rise (fall), then labor supply will fall (rise).

- Nonwage income
  - If nonwage income rises (falls), then labor supply will fall (rise)

- Preferences for work versus leisure
  - If preferences for work increase (decrease), then labor supply will increase (decrease).
Labor Supply Determinants

- Nonwage aspects of job
  - If the nonwage aspects of a job improve (worsen), then labor supply will increase (decrease)

- Number of qualified suppliers
  - An increase (decrease) in the number of qualified workers will increase (decrease) labor supply.
Labor Demand Determinants

- Product demand
  - Changes in product demand that increase (decrease) the product price, will increase (decrease) labor demand.

- Productivity
  - An increase (decrease) in productivity will increase (decrease) labor demand, assuming that it does not cause an offset in the product price.
Labor Demand Determinants

- Prices of other resources
  - For *gross substitutes*, an increase (decrease) in the price of a substitute input will increase (decrease) labor demand.
  - For *gross complements*, an increase (decrease) in the price of a complement input will decrease (increase) labor demand.
Labor Demand Determinants

- Prices of other resources
  - For pure complements, an increase (decrease) in the price of a complement input will decrease (increase) labor demand.

- Number of employers
  - An increase (decrease) in the number of employers will increase (decrease) labor demand.
Changes in Labor Demand

- Assume that the productivity of workers rises due to computer innovations.
- This will raise the marginal product and thus shift the labor demand curve to the right ($D_0$ to $D_1$).
- The equilibrium wage rate will rise to $W_1$ and equilibrium quantity will rise to $Q_1$. 

![Graph showing wage rate and quantity of labor hours]
Assume that the number of working-age immigrants increases substantially.

This will shift the labor supply curve to the right (S₀ to S₁).

The equilibrium wage rate will fall to W₁ and equilibrium quantity will rise to Q₁.
Wage and Employment for a Perfectly Competitive Firm

- A firm hiring in a perfectly competitive labor market is a “wage taker.” Its labor supply curve, $S_L = MWC = P_L$, is perfectly elastic at $W_0$.
- A firm will hire another worker if the additional revenue the worker generates, marginal revenue product (MRP), is greater than the cost of hiring an additional worker, marginal wage cost (MWC).
- The firm maximizes its profits by hiring $Q_0$ units of labor (MRP=MWC).
Allocative Efficiency

- An efficient allocation of labor is obtained when society gets the largest possible amount of output from a given amount of labor.
- Efficient allocation requires the VMP of labor for each product be equal to the price of labor.
- Perfect competition in the product and labor markets creates allocative efficiency.
Questions for Thought

1. What effect will each of the following have on the market demand for a specific type of labor:

   (a) An increase in product demand that increases the product price.

   (b) A decline in the productivity of this type of labor.

   (c) An increase in the price of a gross substitute of labor.

   (d) An increase in the price of a gross complement of labor.

   (e) The demise of several firms that hire this type of labor.

   (f) A decline in the market wage for this type of labor.
2. Wage and Employment Determination: Monopoly in the Product Market
Wage and Employment for a Monopolist

- Because a monopolist faces a downward sloping demand curve, increased hiring of labor and the resulting larger output force the firm to lower its price.
- Because it must lower its price on all units, its marginal revenue (MR) is less than the price.
- The firm’s MRP curve (MP * MR) lies below the VMP curve (MP * P), and thus firm hires $Q_M$ rather than $Q_C$.
- An efficiency loss of abc results.

![Diagram showing Wage rate vs Quantity of Labor Hours with MRP and VMP curves intersecting at Q_M and Q_C.]

$W_0$ = MWC = $P_L$

$D_M$ = MRP (MP*MR)

$D_C$ = VMP (MP*P)

$S_L$ = MWC = $P_L$
1. Complete the following table for a firm operating in labor market A and product market AA.

<table>
<thead>
<tr>
<th>Labor</th>
<th>Wage</th>
<th>TWC</th>
<th>MWC</th>
<th>MRP</th>
<th>VMP</th>
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</table>

(a) What can we conclude about the degree of competition in the labor market and product market?

(b) What is the profit maximizing level of employment?
3. Monopsony
Monopsony

- A *monopsony* is a labor market where a single firm is the sole hirer of a particular type of labor.
- A monopsonist has control over the wage rate workers are paid by hiring more or less labor.
Monopsony

- A monopsonist faces an upward sloping labor curve. It has to pay a higher wage to get more workers.
- The total wage cost (\(TWC\)) to the firm is calculated as the number of units of labor times the wage rate.
- The marginal wage cost (\(MWC\)) is the additional cost of hiring the last worker.
- The firm maximizes profits by hiring \(MRP = MWC\) at 3 units.

<table>
<thead>
<tr>
<th>Units of Labor (L)</th>
<th>Wage (2)</th>
<th>(TWC) (3)</th>
<th>(MWC) (4)</th>
<th>(VMP) (5)</th>
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Wage and Employment for a Monopsonist

- The firm’s MWC lies above the $S_L$.
- The monopsonist equates its MRP with its MWC at point $a$ and hires $Q_M$ units of labor.
- To attract these workers, it need only pay $W_M$.
- The firm thus pays a lower wage ($W_M$ rather than $W_C$) and hires fewer units of labor ($Q_M$ instead of $Q_C$) than firms in a competitive labor market.
- An efficiency loss of $abc$ results.
4. Unions and Wage Determination
Unions and Wages

- Unions can increase the wages of their members by:
  - Increasing the demand for union labor.
  - Restricting the supply of labor.
  - Bargaining for an above equilibrium wage.
To the extent that unions can increase the demand for union labor from \( D_0 \) to \( D_1 \), they can gain both higher wages and employment.
Methods to Increase Union Labor Demand

- Increasing product demand
  - Lobbying for tariffs on foreign goods.
- Enhancing productivity
  - Participation in labor-management committees on productivity
- Influencing the prices of related inputs
  - Lobbying for minimum wage hikes as they raise the price of substitutable less-skilled, nonunion labor.
Methods to Increase Union Labor Demand

- *Davis-Bacon Act*, which requires federal contractors pay the “prevailing” union wage scale.

- Increasing the number of employers
  - Attempts to pass requirements for domestic content for autos sold in the U.S.
If a union decreases the supply of available labor from $S_0$ to $S_1$, the equilibrium wage rate will rise to $W_1$ but the equilibrium quantity will fall to $Q_1$. 
Methods to Decrease Labor Supply

- Reducing the number of qualified suppliers of labor
  - Lobby for laws that reduce immigration, child labor, and length of the workweek.
  - Limit entry into occupation through long apprenticeships.
  - *Occupational licensing* which are laws that require practitioners to meet certain requirements.
Methods to Decrease Labor Supply

- Raising nonwage income
  - Lobby to increase nonwage income sources such as Social Security in order to decrease labor supply.
Bargaining for an Above-Equilibrium Wage

- By organizing all workers and having a union shop (requiring all new hires to join the union), the union may achieve a wage $W_U$ that is above the competitive wage $W_C$.
- The effect is to make the labor supply curve perfectly elastic at $W_U$ until point $d$.
- The employment level will fall from $Q_C$ to $Q_U$.
- An efficiency loss of $abc$ will also result.
- The more elastic is $D_L$, the larger is the employment loss. As result unions try to reduce the elasticity of $D_L$. 

\[ \text{Wage rate} \]

\[ S_L \quad \text{MWC} \]

\[ W_U \quad W_C \]

\[ D_L \]

\[ Q_U \quad Q_C \]

\[ \text{Quantity of Labor Hours} \]
Questions for Thought

1. Explain how each one of the following contract provisions might affect the *elasticity* of labor demand during the period of the labor contract:
   (a) Layoff and severance pay
   (b) Prevention of subcontracting
   (c) The limiting of plant shutdown or relocation

2. Under what elasticity of labor demand conditions could a union restrict the supply of labor—that is, shift the supply curve leftward—and thereby increase the collective wage income (wage bill) of those workers still employed?
5. Bilateral Monopoly
Bilateral Monopoly in the Labor Market

- When a monopsonist faces a “monopolistic” union, both the wage rate and employment are indeterminate.
- The firm would like $W_M$, while the union might want $W_U$. The outcome depends on the relative bargaining strength of each party.
- The presence of a union makes the MWC facing the firm is a horizontal line. Thus, the firm maximizes profits (setting MWC=MRP) at points on $D_L$.
- Assume the union bargains for a wage above $W_M$ but below $W_U$, such as $W_C$.
- Then employment and allocative efficiency will increase relative to monopsony alone ($W_M$ & $Q_M$).
6. Wage Determination: Delayed Supply Responses
Cobweb Model

- The market for highly trained professionals such as nurses has delayed supply responses to changes in demand and wage rates.
- Because the quantity of labor supplied is temporarily fixed at $Q_0$, the wage rate rises to $W_1$ when demand changes from $D_0$ to $D_1$.
- At wage rate $W_1$, $Q_1$ nurses are attracted to the profession.
- With supply fixed at $Q_1$, the wage rate falls to $W_2$.
- With this wage rate, the quantity of nurses falls over time to $Q_2$.
- The cycle repeats until equilibrium is achieved at the intersection of $S$ and $D$. 

![Cobweb Model Diagram](image)
Evidence

- Some evidence exists for cobweb adjustments in markets such as lawyers and engineers.

- Critics argue that:
  - Students make choices on the basis of the *lifetime earnings stream* rather than *starting salaries*.
  - Students make a forecast of the long run outcome of a change in demand or supply and make the right choice.
End
Chapter 6