

# Chapter 12

## The Demand For Resources

# Chapter Objectives

- Resource pricing
- Marginal revenue productivity and firm resource demand
- Factors that affect resource demand
- Elasticity of resource demand
- Optimal combination of resources for the competitive firm

# Resource Pricing

- Firms demand resources
  - Focus on labor
- Resource prices are important
  - Money-income determination
  - Cost minimization
  - Resource allocation
  - Policy issues

# Resource Demand

- All markets are competitive (good and resource)
- Derived demand depends on:
  - Productivity of resource (MP)
  - Price of good it helps produce (P)
- Marginal revenue product (MRP)
  - Change in TR resulting from unit change in resource (labor)

# Resource Demand

Rule for employing resources:

- $MRP = MRC$
- Marginal Revenue Product (MRP)

$$\text{Marginal Revenue Product} = \frac{\text{Change in Total Revenue}}{\text{Unit Change in Resource Quantity}}$$

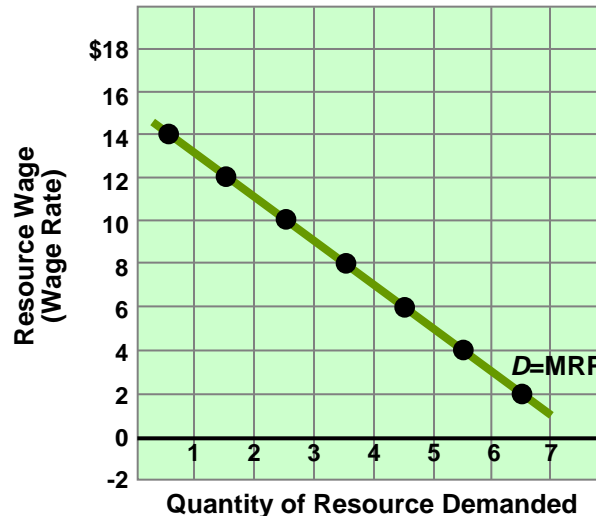
- Marginal Resource Cost (MRC)

$$\text{Marginal Resource Cost} = \frac{\text{Change in Total (Resource) Cost}}{\text{Unit Change in Resource Quantity}}$$

# MRP as Resource Demand

(1) Units of Resource	(2) Total Product (Output)	(3) Marginal Product (MP)	(4) Product Price	(5) Total Revenue, (2) X (4)	(6) Marginal Revenue Product (MRP)
0	0	7	\$2	\$ 0	\$14
1	7	6	2	14	12
2	13	5	2	26	10
3	18	4	2	36	8
4	22	3	2	44	6
5	25	2	2	50	4
6	27	1	2	54	2
7	28		2	56	

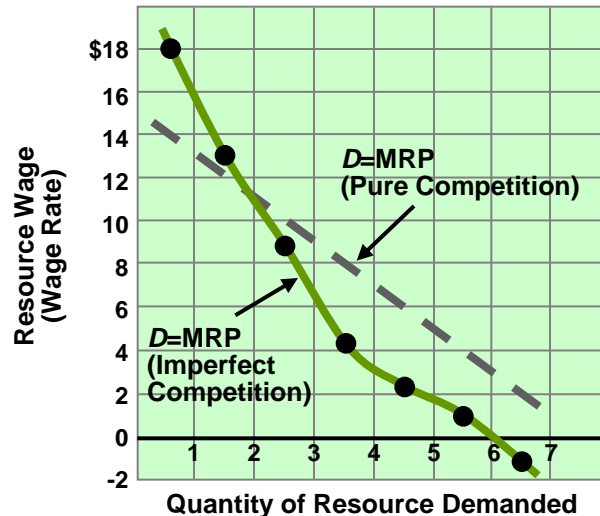
**Purely  
Competitive  
Firm's  
Demand for  
A Resource**



# MRP as Resource Demand

(1) Units of Resource	(2) Total Product (Output)	(3) Marginal Product (MP)	(4) Product Price	(5) Total Revenue, (2) X (4)	(6) Marginal Revenue Product (MRP)
0	0	7	\$2.80	\$ 0.00	\$18.20
1	7	6	2.60	18.20	13.00
2	13	5	2.40	31.20	8.40
3	18	4	2.20	39.60	4.40
4	22	3	2.00	44.00	2.25
5	25	2	1.87	46.25	1.00
6	27	1	1.75	47.25	-1.05
7	28		1.65	46.20	

***Imperfectly  
Competitive  
Firm's  
Demand for  
A Resource***



# Resource Demand

- Amount purchased at different resource prices, all else the same
  - For the firm, equal to MRP
  - Market demand equals sum of firm demand
- Downsloping because of DMR
  - Changes in price for imperfect competition

# Determinants of Resource Demand

- Changes in product demand
- Changes in productivity
  - Quantities of other resources
  - Technological advance
  - Quality of variable resource

# Determinants of Resource Demand

- Changes in the price of substitute resources
  - Substitution effect
  - Output effect
  - Net effect
- Changes in the price of complementary resources

# Employment Trends

- Rising employment
  - Services
  - Health care
  - Computers
- Declining employment
  - Labor saving technological change
  - Textiles

# Elasticity of Resource Demand

$$E_{rd} = \frac{\text{Percentage Change in Resource Quantity}}{\text{Percentage Change in Resource Price}}$$

- Ease of resource substitutability
- Elasticity of product demand
- Ratio of resource cost to total cost

# Optimal Combination of Resources

- All resource inputs are variable
- Choose optimal combination
- Minimize cost of producing a given output
- Maximize profit

# The Least Cost Rule

- Minimize cost of producing a given output
- Last dollar spent on each resource yields the same marginal product

$$\frac{\text{Marginal Product Of Labor (MP}_L\text{)}}{\text{Price of Labor (P}_L\text{)}} = \frac{\text{Marginal Product Of Capital (MP}_C\text{)}}{\text{Price of Capital (P}_C\text{)}}$$

# Profit Maximizing Rule

- MRP of each resource equals its price

$$P_L = MRP_L \quad \text{and} \quad P_C = MRP_C$$

$$\frac{MRP_L}{P_L} = \frac{MRP_C}{P_C} = 1$$

# Income Distribution

- Paid according to value of service
  - Workers
  - Resource owners
- Inequality
  - Productive resources unequally distributed
- Market Imperfections

# Case of ATM's

- Input substitution
- Banks use ATMs instead of people
- Least-cost combination of resources
- ATMs debut about 35 years ago
- 11 billion U.S. transactions per year
- 80,000 tellers eliminated 1990-2000
- Former tellers find new jobs
- Customer convenience

# Key Terms

- derived demand
- marginal product (MP)
- marginal revenue product (MRP)
- marginal resource cost (MRC)
- $MRP=MRC$  rule
- substitution effect
- output effect
- elasticity of resource demand
- least-cost combination of resources
- profit-maximizing combination of resources
- marginal productivity theory of income distribution

# Next Chapter Preview...

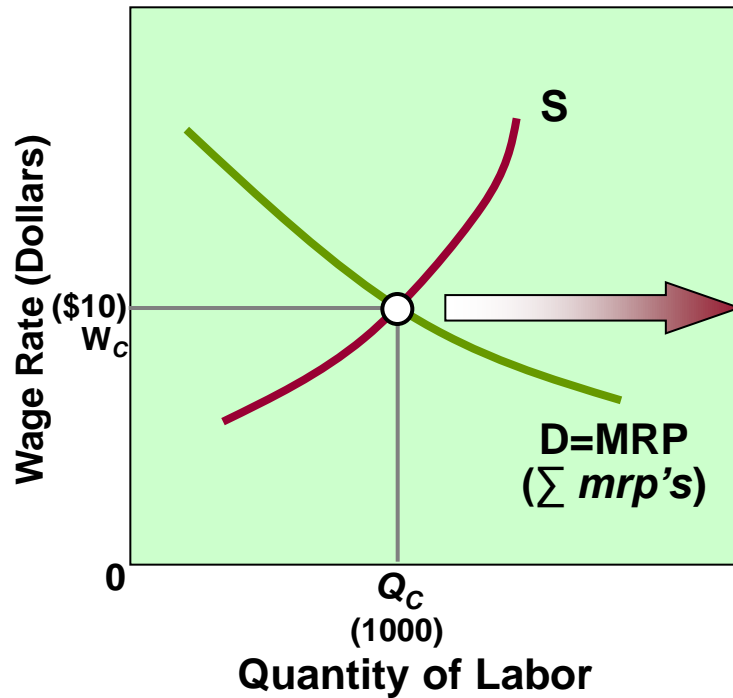
## **Wage Determination**

# Competitive Labor Market

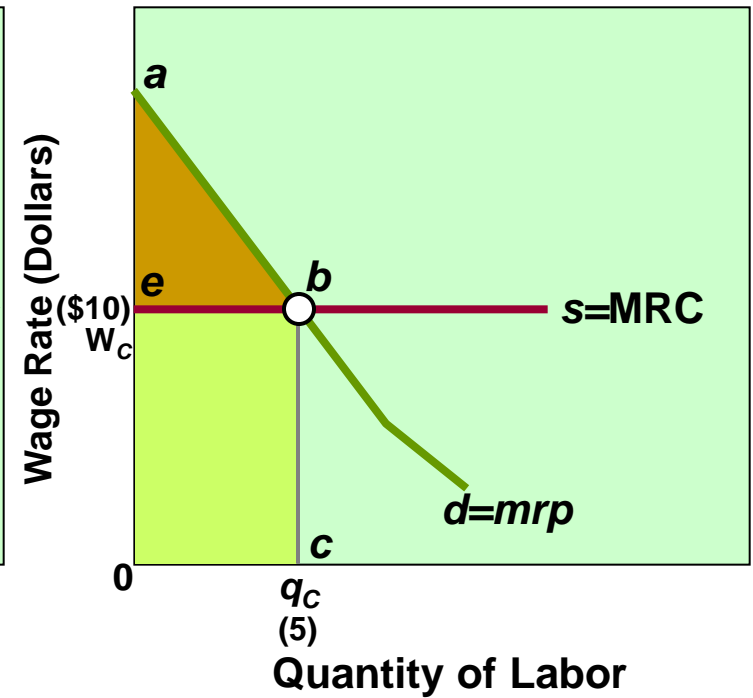
- Market demand for labor
  - Sum of firm demand
  - Example: carpenters
- Market supply for labor
  - Upward sloping
  - Competition among industries
- Labor market equilibrium
  - $MRP = MRC$  rule

# Competitive Labor Market

## Labor Market



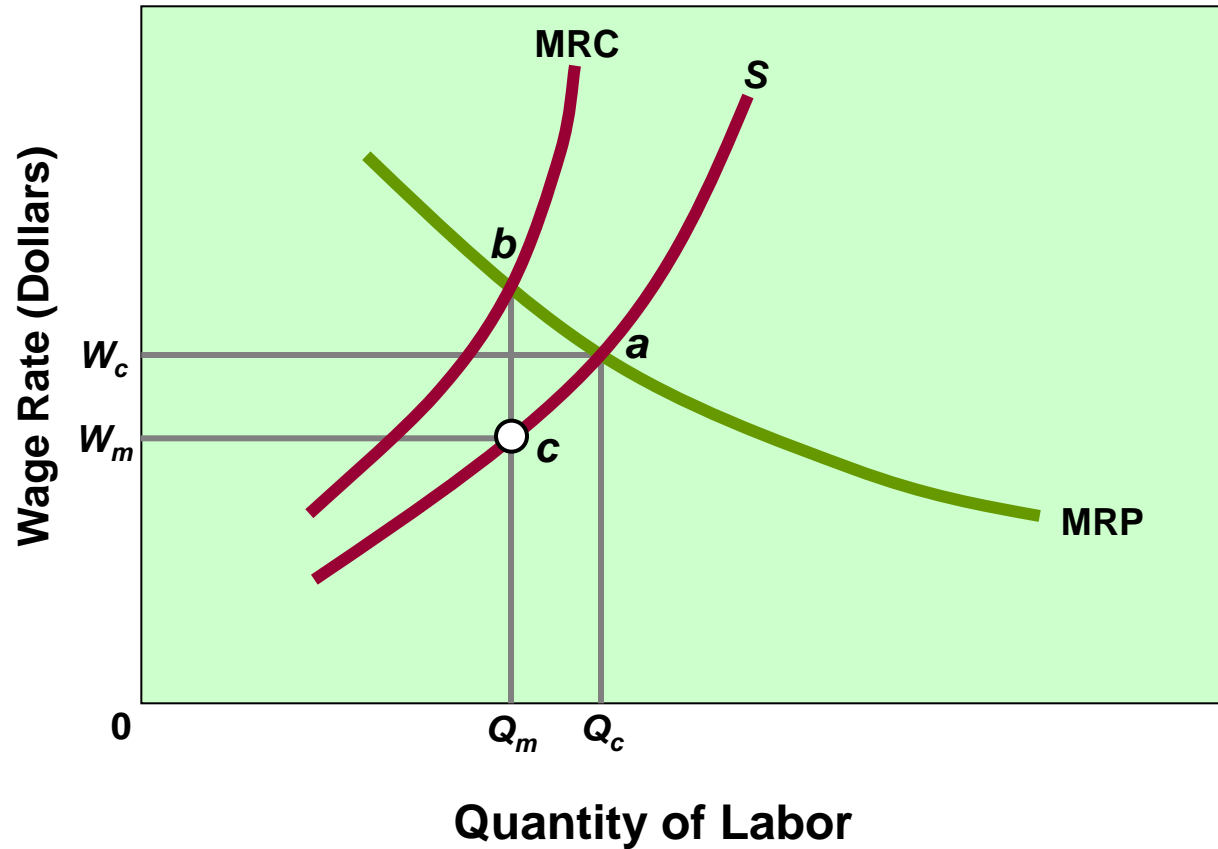
## Individual Firm



# Monopsony Model

- Employer has buying power
- Characteristics
  - Single buyer
  - Labor immobile
  - Firm “wage maker”
- Firm labor supply upward sloping
- MRC higher than wage rate
- Equilibrium

# Monopsony Model



- Examples of monopsony power