Chapter Five

Demand for Labour in Competitive Labour Markets

Prepared by Dr. A. Noordeh
York University
Assisted by I. Bershad

Learning Objectives

- Labour Demand Function
- Labour Demand Decision in the Short and Long Run
- Elasticity of Demand for Labour
- Competitiveness of Canadian Labour
- Labour Demand and Globalization

Demand for Labour

- The theory of labour demand examines the quantity of labour services the firm desires to employ given:
  - the market-determined wage rate, or
  - the labour supply function the firm faces
- The demand for labour is derived from the output produced by the firm

Employment Decisions

Two time horizons for decision making:

- **Short-run**
  One or more factors of production cannot be varied
- **Long-run**
  Firm can adjust all of its inputs—all factors of production are variable factors

Demand for Labour

Demand for labour depends on the firms objectives and constraints:

- Objective: Profit Maximization
- Constraints:
  - **Market structure**
  - **Demand for the product (output)**
  - **Factor prices**
  - **Production function (the maximum output given the various combinations of inputs)**
  - **The decision making time frame (short run vs. long run)**

Market Structures

The structures of both the output and labour markets influence the demand and supply of labour and, hence, the employment and the wage outcomes.

Categorizing the Structure of Product Markets

- Industry (market) Structures
  - Perfect Competition
  - Monopolistic Competition
  - Oligopoly
  - Monopoly

decreasing degree of competition

Categorizing the Structure of Labour Markets

- Industry Structures
  - Perfect Competition
  - Monopsonistic Competition
  - Oligopsony
  - Monopsony

decreasing degree of competition

Characteristics of Industry/Market Structures

- Categories are independent of each other
- 16 possible combinations that affect wage and employment outcomes

Market Structures

The essence of the wage and employment decision by the firm can be captured by examination of two extreme cases:

For Labour Demand:

- Perfect Competition/Monopoly

For Labour Supply:

- Perfect Competition/Monopsony

Demand for Labour in the Short Run

Perfect Competition Case

Production Function

Assumptions:

- Firms use two factors of production
  - Labour (N) and
  - Capital (K) to produce Q (output)
  - Thus, $Q = F(K, N)$
- K is fixed in short run

Profit-Maximization

- Costs fall into two categories:
  - Fixed (*sunk cost)*
  - Variable

Decision Rule #1

- Operate as long as variable costs are covered *(i.e. total revenue exceeds or is equal to total variable costs)*

Profit-Maximization

Decision Rule #2

- Increase output until the additional cost associated with the last unit produced (MC) equals the additional revenue associated with that unit (MR), that is:

  Marginal Cost equals Marginal Revenue

  MC = MR

Profit-Maximizing in Terms of Labour Demand

- Terminology is modified:
  - **Total Revenue Product (TRP):** the total revenue associated with the amount of an input employed
  - **Marginal Revenue Product (MRP):** the change in total revenue associated with a change in the amount of input employed

Profit-Maximizing Decisions in Terms of Labour

- **Firm should:**
  - **Produce as long as the total revenue product generated by the variable input (e.g. labour) exceeds the total costs associated with employing that input, or:**

    $\mathbf{TRP_N > TC_N}$
  - **Expand employment of labour to the point at which its marginal revenue product equals marginal cost:**

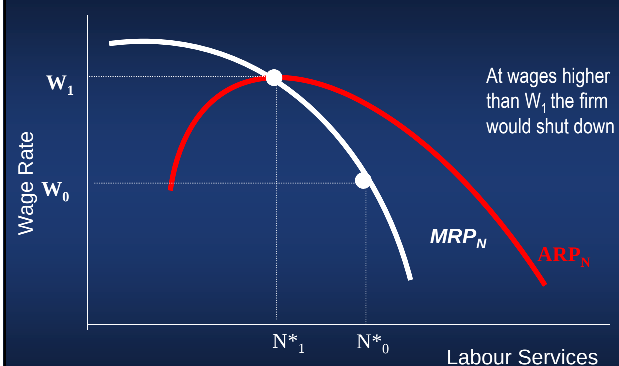
    $$\mathbf{MRP_N = MC_N = W}$$

A Firm's Short-Run Demand for Labour in a Competitive Market

Characteristics of a firm in a competitive market:

- price taker
- can hire labour without affecting market wage
- marginal (and average) cost is the market wage
- hire labour until the MRP equals the W
- short-run labour demand curve is its marginal revenue product curve

Short-Run Demand for Labour



Short-Run Demand for Labour

- Firm will shut down:
  - If average cost of labour (wage rate) exceeds the average revenue product of labour
- Short-run labour demand curve:
  - The same as MRP_N curve, below the point at which the average and marginal product curves intersect

Short-Run Labour Demand Curve

- Downward sloping because of diminishing marginal returns to labour
- ↓ in wage rate will cause ↑ in demand for labour
- ↑ in wage rate will cause ↓ in demand for labour

Labour Demand in the Long-Run

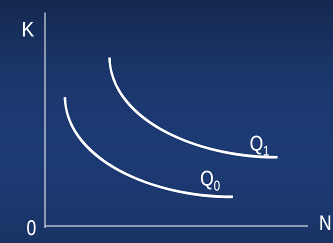
All inputs are variable—no fixed costs

Labour Demand in the Long-Run

Isoquants:

- “Equal quantity”
- Combinations of labour and capital used to produce a given amount of a product (output)
- Slope exhibits a diminishing marginal rate of technical substitution **(MRTS)**

Isoquants



Labour Demand in the Long-Run

Isocost Line:

- All combinations of capital and labour that can be bought for a given total cost

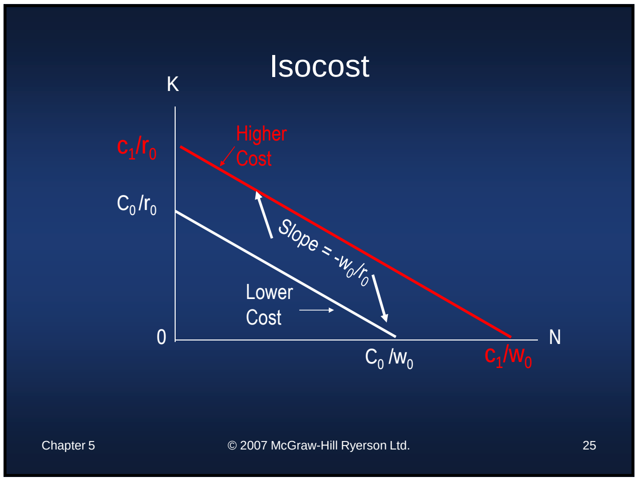
$$\mathbf{TC = rK + wN}$$

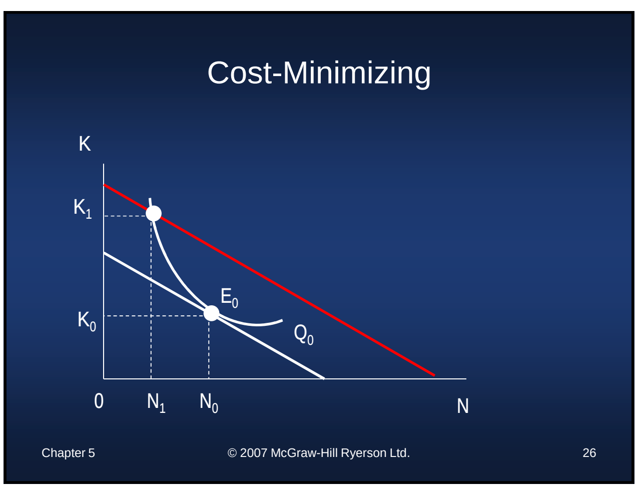
Where,

K = capital and N = labour

r = price of capital

w = wage

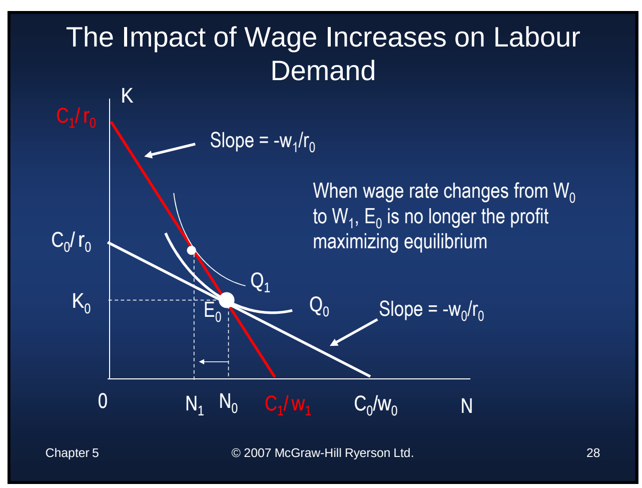




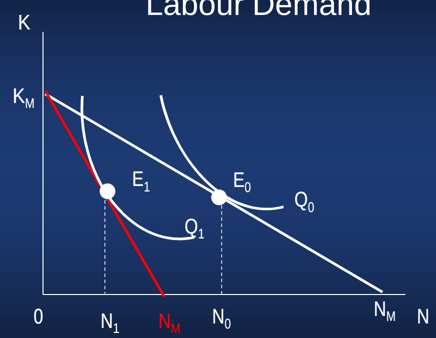
A Firm's Labour Demand

The long run labour demand is determined by the long run profit maximizing (cost minimizing) labour requirements such as point N_0 in the previous diagram.

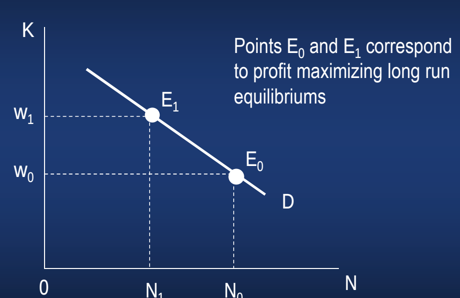
Chapter 5 © 2007 McGraw-Hill Ryerson Ltd. 27



Profit Maximizing Output and Derived Labour Demand



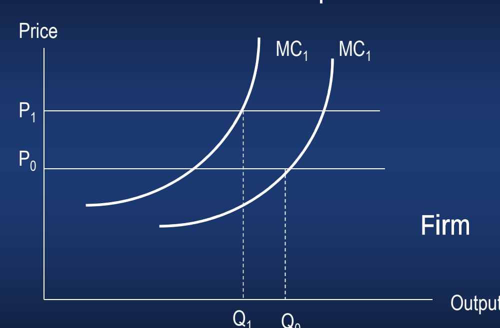
Derived Labour Demand Schedule



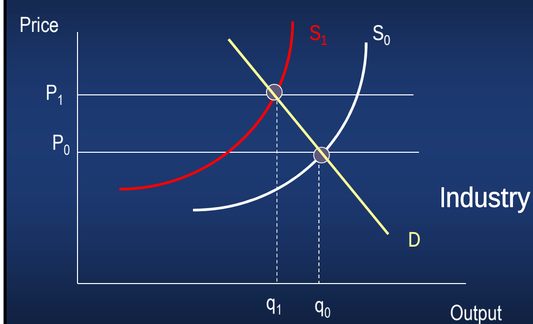
The Effect of a Cost (Wage) Increase on Output Under Perfect Competition

- ↑ wage rotates isocost line inwards
- The firm will maximize profit by reducing the labour and substituting capital for labour
- ↑ wage also shifts up the firm's marginal and average cost curves
- In a perfect competitive industry each firm reduces output and raises the price of the product

The Effect of a Cost Increase on Output Under Perfect Competition



The Effect of a Cost Increase on Output Under Perfect Competition

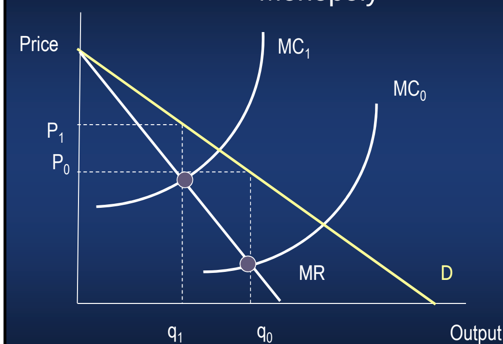


The Effect of a Cost Increase on Output Under Monopoly

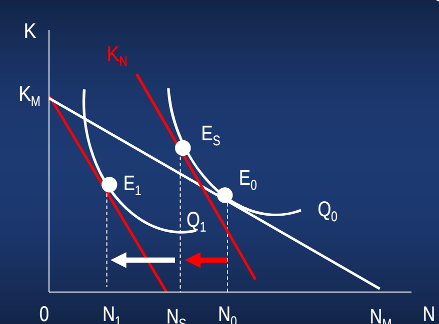
Properties:

- Single supplier
- No close substitute for the product
- Price setter
- Profit maximization conditions: MR = MC
- P > MC
- Firm and industry demands are the same
- When the monopolist hires more labour to produce more output, both the marginal physical product of labour and the marginal revenue falls

The Effect of a Cost Increase on Output Under Monopoly



Substitution and Scale Effects of a Wage Change



Substitution and Scale Effects

- Firm would substitute cheaper inputs for the more expensive labour:
  - SUBSITUTION EFFECT
- Firm would reduce its scale of operations because of the cost increase associated with the increase in wage:
  - SCALE EFFECT

Short and Long Run

- Short-Run
  - amount of capital is fixed
  - no substitution effect
- Long-Run
  - firm has flexibility by varying its capital stock
  - response to a wage change will be larger in the long run

Elasticity of Demand for Labour

- Demand for labour decreases as wages increase (negative function)
- Wage increases have an adverse effect on employment
- The magnitude of the effect can be seen by the elasticity of the derived demand for labour

Elasticity of Demand

- Measures the responsiveness of the quantity of labour demanded to the wage rate
- Equals the % change in the quantity of labour demanded divided by the % change in the wage rate

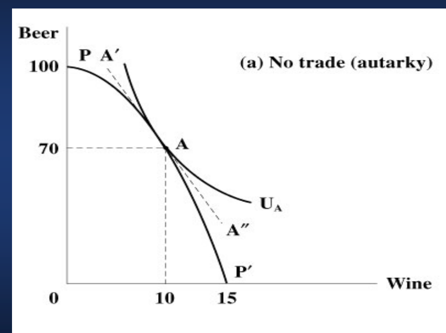
Elasticity of Demand for Labour

- The elasticity of demand for labour will be higher if:
  - – the availability of substitute inputs is high
  - – Elasticity of supply of substitute inputs is high
  - – demand for output is elastic
  - – ratio of labour cost to total cost is large

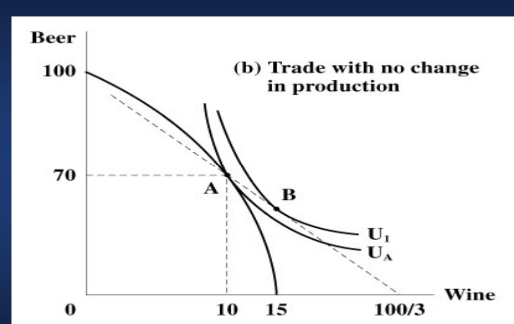
Labour Demand and Globalization

- Changing demand conditions
- Globalization
  - – Role of multinational corporations
- Outsourcing
- Impact of Information and Communication Technologies (ITCs)

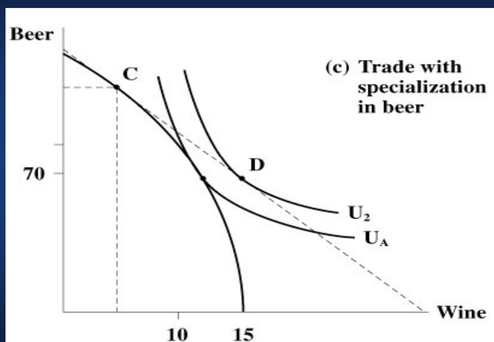
Labour Demand and Globalization



Labour Demand and Globalization



Labour Demand and Globalization



Labour Demand and Globalization

- Increase in the overall welfare of the country
- Distributional effects of globalization and trade:
    - **What happens to the shrinking industry employees?**

Summary

- Derived Labour Demand
- Firm's Profit Maximization and Labour Demand:
    - Short Run: W = MRP
    - Long Run: Factor Substitution
- Labour Demand Curve
- The Impact of Globalization and Outsourcing

End of Chapter Five