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

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)

Categorizing the Structure of Product Markets

• Industry (market) Structures
  – Perfect Competition
  – Monopolistic Competition
  – Oligopoly
  – Monopoly

Categorizing the Structure of Labour Markets

• Industry Structures
  – Perfect Competition
  – Monopsonistic Competition
  – Oligopsony
  – Monopsony

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.
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-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-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 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:
    \( TRP_N > TC_N \)
  – Expand employment of labour to the point at which its marginal revenue product equals marginal cost:
    \( MRP_N = MC_N = W \)
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

- 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\(_h\) 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

 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)

Isoquant Line:
- All combinations of capital and labour that can be bought for a given total cost
  \[ TC = rK + wN \]
  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.

The Impact of Wage Increases on Labour Demand

When wage rate changes from \( W_0 \) to \( W_1 \), \( E_0 \) is no longer the profit maximizing equilibrium.
Profit Maximizing Output and Derived Labour Demand

The Effect of a Cost (Wage) Increase on Output Under Perfect Competition
- \( \uparrow \) wage rotates isocost line inwards
- The firm will maximize profit by reducing the labour and substituting capital for labour
- \( \uparrow \) 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

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
Substitution and Scale Effects

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

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

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

- 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

- 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