UNIT 6

Pricing under different market structures

Perfect Competition
Market Structure

- Perfect Competition
- Monopolistic Competition
- Oligopoly
- Duopoly
- Monopoly

The further right on the scale, the greater the degree of monopoly power exercised by the firm.
Perfect Competition

- Firms are price-takers
  - Each produces only a very small portion of total market or industry output
- All firms produce a homogeneous product
- Entry into & exit from the market is unrestricted
Demand for a Competitive Price-Taker

• Demand curve is horizontal at price determined by intersection of market demand & supply
  – Perfectly elastic

• Marginal revenue equals price
  – Demand curve is also marginal revenue curve \((D = MR)\)

• Can sell all they want at the market price
  – Each additional unit of sales adds to total revenue an amount equal to price
Demand for a Competitive Price-Taking Firm

Panel A – Market

Panel B – Demand curve facing a price-taker
Short-Run Market Supply and Demand Graph

Market Supply

Market Demand

P

Q

P = D = MR

P

Q

Profits

Q_{profit max}

MC

ATC

P
Profit-Maximization in the Short Run

- In the short run, managers must make two decisions:
  1. Produce or shut down?
     - If shut down, produce no output and hire no variable inputs
     - If shut down, firm loses amount equal to TFC
  2. If produce, what is the optimal output level?
     - If firm does produce, then how much?
     - Produce amount that maximizes economic profit

\[ \text{Profit} = \pi = TR - TC \]
Determining Profits Graphically: A Firm with Profit

Find output where 
\[ MC = MR, \] 
this is the profit maximizing \( Q \).

Find profit per unit where the profit max \( Q \) intersects ATC.

Since \( P > ATC \) at the profit maximizing quantity, this firm is earning profits.
Determining Profits Graphically: A Firm with Losses

- Find output where \( MC = MR \), this is the profit maximizing \( Q \).
- Find profit per unit where the profit max \( Q \) intersects ATC.
- Since \( P < ATC \) at the profit maximizing quantity, this firm is earning losses.
Determining Profits Graphically: A Firm with Zero Profit or Losses

Find output where $MC = MR$, this is the profit maximizing $Q$.

Find profit per unit where the profit max $Q$ intersects $ATC$.

Since $P = ATC$ at the profit maximizing quantity, this firm is earning zero profit or loss.
Determining Profits Graphically: The Shutdown Decision

- The shutdown point is the point below which the firm will be better off if it shuts down than it will if it stays in business.
- If \( P > \text{min of AVC} \), then the firm will still produce, but earn a loss.
- If \( P < \text{min of AVC} \), the firm will shut down.
- If a firm shuts down, it still has to pay its fixed costs.
Short-Run Output Decision

- Firm’s manager will produce output where \( P = MC \) as long as:
  - \( TR \geq TVC \)
  - or, equivalently, \( P \geq AVC \)

- If price is less than average variable cost (\( P < AVC \)), manager will shut down
  - Produce zero output
  - Lose only total fixed costs
  - Shutdown price is minimum \( AVC \)
Irrelevance of Fixed Costs

- Fixed costs are irrelevant in the production decision
  - Level of fixed cost has no effect on marginal cost or minimum average variable cost
  - Thus no effect on optimal level of output
The Competitive Firm’s Short run Supply

- Portion of MC curve above $AVC_{\text{min}}$
- MC curve gives the relationship between $P$ and $Q_s$

$P = D = MR$

$P_{\text{Shut down}}$

$Q_{\text{profit max}}$
Determinants of Market Supply

- The number of firms in the industry
- The average size of firms in the industry measured by quantity of fixed inputs employed
- The price of variable inputs used by firms in the industry
- The technology employed in the industry.
Summary of Short-Run Output Decision

- \(AVC\) tells whether to produce
  - Shut down if price falls below minimum \(AVC\)
- \(SMC\) tells how much to produce
  - If \(P \geq\) minimum \(AVC\), produce output at which \(P = SMC\)
- \(ATC\) tells how much profit/loss if produce

\[\pi = (P - ATC)Q\]
Profit & Loss at Beau Apparel

Panel A: $P = $20
Profit & Loss at Beau Apparel

Panel B: \( P = \$15 \)
Long-Run Competitive Equilibrium

• All firms are in profit-maximizing equilibrium \((P = LMC)\)

• Occurs because of entry/exit of firms in/out of industry
  – Market adjusts so \(P = LMC = LAC\)
Market adjusts so \( P = LMC = LAC \)

Since \( P = LAC \) at the profit maximizing quantity, this firm is earning zero profit.
LAC and LMC

• Long-run Average Cost (LAC) curve
  – is U-shaped.
  – the envelope of all the short-run average cost curves;
  – driven by economies and diseconomies of scale.

• Long-run Marginal Cost (LMC) curve
  – Also U-shaped;
  – intersects LAC at LAC’s minimum point.
Economies and Diseconomies of Scale

• Economies of Scale - long run average cost decreases as output increases.
  – Technological factors
  – Specialization

• Diseconomies of Scale: - long run average cost increases as output increases.
  – Problems with management – becomes costly, unwieldy
LONG-RUN AVERAGE COST CURVE

Economies of Scale

Diseconomies of Scale
LONG-RUN AVERAGE and MARGINAL COST CURVES

LAC

LMC

COST

Q

0

Q₁

Q
Class Exercise

1. In a given market, demand is described by the equation $Q_D = 1,800 - 10P$ and supply is described by $Q_S = 200 + 10P$.

Determine the equilibrium price and quantity.

2. The marginal cost of a firm under perfect competition is given by the equation $MC = 20 + 2Q_F$. The market price is $50 per unit.

Determine the firm’s profit-maximizing level of output.

3. For a perfectly competitive firm, long-run average cost is: $LAC = 300 - 20Q_F + 0.5Q_F^2$, where $Q_F$ denotes the firm’s output.

Determine the firm’s long-run profit-maximizing output and price.
1. Setting \( Q_D = Q_S \) implies \( P = $80 \) and \( Q = 1,000 \) units.

2. The firm maximizes its profit by setting: \( P = MC \). Therefore, we have \( 50 = 20 + 2Q_F \), or \( Q_F = 15 \).

3. In the long run, under perfect competition, firms will produce at the minimum point on their LAC curve. To find the minimum of LAC, we set \( dLAC/dQ \) equal to 0. Therefore, \( -20 + Q_F = 0 \), so that \( Q_F = 20 \). The firm’s demand curve is horizontal and tangent to LAC. Therefore, price is equal to the minimum value of LAC. We find minimum LAC to be:

\[
300 - (20)(20) + 0.5(20)^2 = 100.
\]

Thus, \( P_C = 100 \).