Production in Perfectly Competitive Markets

How prices act as signals for production decisions in markets with many suppliers
Assumed that there were many buyers and sellers
- no single agent had control over market outcomes
- each agent was a price-taker: their own decisions had no influence on market price

In contrast, a monopolist has some power over price --- given by the elasticity of the demand curve they
Prices as Signals

- In perfectly competitive markets, prices act as signals for decision-making.
- When prices are relatively high, this sends producers a signal that they can earn more by expanding output or entering a market.
- When prices are relatively low, producers must contract output or exit the market.
Conditions for Perfect Competition

- Large number of buyers and sellers
- Goods offered are functionally identical
  - Demand curves facing individual firms are perfectly elastic
- Freedom of entry and exit
  - Profits act as a signal regarding whether to enter or exit an industry
Efficiency Properties

- Perfect competition ensures that prices in the long-run equal marginal cost
  - maximise value created
  - Allocative efficiency

- Perfect competition ensures that production is carried out at the minimum cost
  - Productive efficiency
**Perfectly Elastic Firm**

**Demand**

- The market demand curve for pens is downward sloping (that is, not perfectly elastic).
  - Why? Because individual consumers have different willingnesses to pay for different quantities of pens.

- Individual firm demand is flat.
  - Why? Because the pens sold by the newsagent and supermarket are close substitutes.
Demand and Revenue

Perfectly Elastic Demand or Average Revenue
What is Marginal Revenue?

Price

P

AR = MR
Flat Marginal Revenue

- As a firm produces more, the price per unit of output sold does not fall.
  - Why? The firm is a price taker.
  - In a perfectly competitive market, a firm cannot influence price. Therefore, the firm is unconstrained and can sell as much as it wants at the prevailing price.
  - Unless they get really big and start to hit market demand. But their costs prevent this.
Optimal Output: A Review

- Firms attempt to maximise profit
- The profit maximising output level occurs where marginal revenue (MR) equals marginal cost (MC)
Profit Maximising Output

Price

MC

ATC

P=MR=AR

AVC

Quantity
Profit Maximising Output

Price

MC

ATC

P=MR=AR

AVC

Quantity
**Profit Maximising Output**

- **Price**
- **Quantity**

- **MC**
- **ATC**
- **P=MR=AR**
- **AVC**

At point **Q_{Max}**, the graph shows where the Marginal Cost (MC) intersects with the Average Variable Cost (AVC) and the Price (P), indicating the profit-maximising output.
Profit Maximising Output

Price

Quantity

MC
ATC
P=MR=AR
AVC

$Q_{\text{Max}}$
Profit Maximising Output

Price

MC

ATC

Q_{\text{Max}}

P=MR=AR

AVC

Maximum Profits!
The Competitive Firm’s Shut-Down Decision

- When should a firm choose to exit a perfectly competitive market?
  - Compare the economic profit from staying versus closing down.
- Alternative levels of output produced because the firm is a price taker.
- If the selling price is below the minimum average variable cost, the
Shut Down! Costs are greater than market price.

Price

Quantity

Don’t Produce!

P = MR = AR

MC

ATC

AVC
Shut Down! Costs are greater than market price

P = MR = AR

Loss!

Don’t Produce!
The Competitive Firm’s Shut Down Decision

- Alternative levels of output produced because the firm is a price taker.
- If the selling price is above the minimum average variable cost but below average total cost, the firm should produce in the short-run a quantity that corresponds with MR = MC.
  
  Incurs economic losses, but minimized.
Short-Run Production

Minimize Losses when MR = MC

Price

MC

ATC

AVC

P=MR=AR

Q_{short-run}

Quantity
The Competitive Firm's Output Decision

- Alternative levels of output produced because the firm is a price taker.

- If the selling price is above the minimum average total cost the firm should *produce* a quantity that corresponds with \( MR = MC \). Incurs economic profits.
The Competitive Firm's Output Decision

Price

MC

ATC

P=MR=AR

AVC

Q_{Max}

Quantity
When Should A Firm Enter?

- A firm should enter into an industry if it believes price will exceed average total costs in the long-run.
- Enter if P > AC.
Output, Price, and Profit in the Long Run

- In short-run equilibrium, a firm might make an economic profit, incur an economic loss, or break even (make a normal profit). Only one of these situations is a long-run equilibrium.

- In the long run:
  - The number of firms in an industry changes.
  - Firms change the scale of their plants.
Economic Profit and Economic Loss as Signals

- If an industry is earning above normal profits (positive economic profits), firms will enter the industry and begin producing output.
- This will shift the industry supply curve out, lowering price and profit.
Economic Loss as a Signal

- If an industry is earning below normal profits (negative economic profits), some of the weaker firms will leave the industry.
- This shifts the industry supply curve in, raising price and profit.
Entry, Exit and Supply Shifts
Long-Run Equilibrium

- In long-run equilibrium, firms will be earning only a normal profit. Economic profits will be zero.
- Firms will neither enter nor exit the industry.
Case: Entry in Response to a Demand Shift

- Zinfandel grape: used in the U.S. to produce Zinfandel wine.
- From 1985 to 1991, the price of these grapes rose and then fell.
- What accounted for the price rise?
  - New product in mid-1980s: “white Zinfandel” which was more popular than the previous red wine.
Grape Price Movements
New Entry by Vineyards

New Vineyards

Year

Number of Acres

Identifying Competitors

- Is another firm’s product a close substitute to your own?
- What are the close substitutes to ...
  - Mazda 323
  - Compaq Presario
  - Diet Coke
  - Yahoo
  - Melways
  - Gans et.al. textbook
Product Differentiation

- Two views:
  - competitive markets are characterised by relatively similar products
  - there are substitutes to monopoly products
- Monopoly power is a matter of degree
  - what ability does an individual firm have to change price
  - look to cross price elasticities
Cross Price Elasticity of Demand

Cross price elasticity of demand is a measure of the sensitivity of demand to changes in the price of another product.

Consider two products, X and Y:

\[
E_{XY} = \frac{\% \Delta Q_X}{\% \Delta P_Y} = \frac{\Delta Q_X / Q_X}{\Delta P_Y / P_Y} = \frac{P_Y}{Q_X} \cdot \frac{fQ_X}{fP_Y}
\]

Measure of how much a demand curve shifts
Sources of Product Differentiation

- Differences in characteristics of products offered by different firms
  - breakfast cereals, magazines
- Differences in the location of different firms
  - restaurant location
  - supermarkets
  - search engines?
- Perceived differences
  - advertising, packaging, brand image
Market Definition

Why is market definition important?

- Strategic: What firms constrain your pricing decision?
  - Who limits your added value.

- Antitrust: Does a firm have monopoly power?
  - E.g., Staples and OfficeMax merger
Product Differentiation

Softening Price

Competition
Differentiate Product

Develop content in difficult to replicate ways:

- Britannica: quality and size

  versus

- Bigbook and maps

- West Publishing and page number system (need legal protection as well)
Optimal Differentiation

1’s AV

Firm 1  Firm 2
Optimal Differentiation

1’s Loses

But gains ...

Firm 1  Firm 2
Product Differentiation

- If have different product than rival,
  - then by cutting price will not capture entire market
  - therefore, lower price will not provoke as tough a response from rival.
- A similar effect occurs if there are customer-specific switching costs
Lock-In & Switching Costs

- ‘Loyalty’ programs
- Learning by using
- Connection and Disconnection Costs
- Search costs
Loyalty Programs

- Constructed by firm
  - Frequent flyer programs
  - Frequent coffee programs

- Personalised Pricing
  - Gold status
  - Example: Amazon and Barnes and Noble
    - Amazon Associates Program v. B&N's Affiliates program

- Add nonlinearity?
  - Power E-trade
Small Switching Costs Matter

- Phone number portability
- Bank account numbers
- Stock broker account
- Email addresses
  - Hotmail (advertising, portability)

Learning and Training
- Word processor/file conversion
- E-mail program
- Browser bookmarks
Connection Costs

- Customer switches from A to “same position” w/ B
  - Total switching costs = customer costs + B's costs

- Example
  - Switching ISPs costs customer $50 new ISP $25
  - New ISP make $100 on customer, switch
  - New ISP makes $70 on customer, no switch

- Disruption costs
Differentiation Strategy

- Can soften price competition
- But if too successful, may change game to dominant firm outcome
  - Compete for the market
  - Standards wars
  - Grab installed base for lock-in