

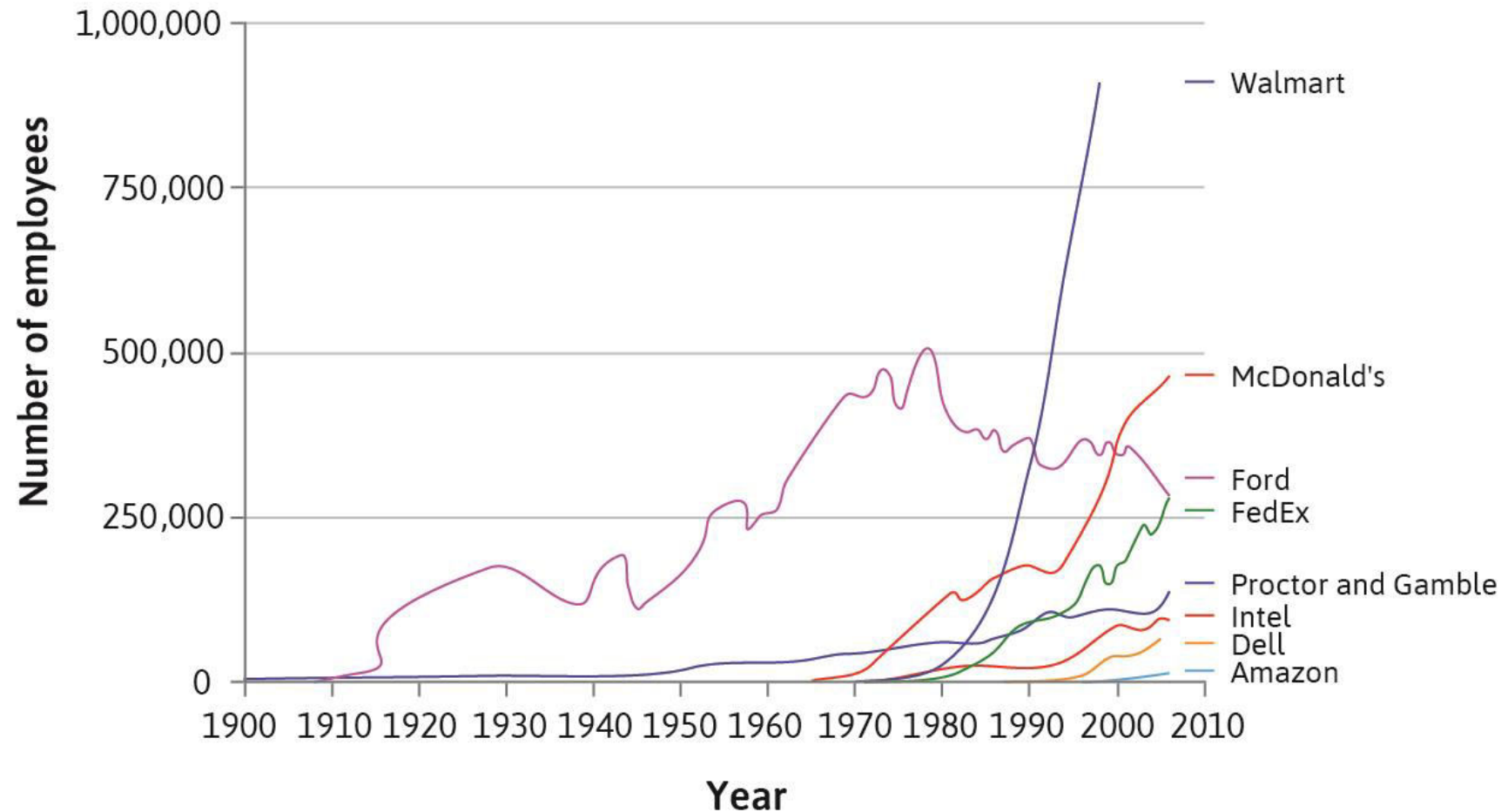
Unit 7

THE FIRM AND ITS CUSTOMERS

OUTLINE

- A. Introduction
- B. Production: Key concepts
- C. Pricing and Production Decisions: Profit maximization
- D. Gains from Trade
- E. Price Elasticity of Demand

A. Introduction



In all developed countries, most people work for large firms. A firm's success and ability to grow partly depends on its pricing and production decisions.

The Context for This Unit

Interactions between firms and workers determine wages, which are part of a firm's production costs. (Unit 6)

Other key decisions for firms include choosing product prices and quantities to produce.

- How do these decisions depend on demand and production costs?
- How can policies affect the division of surplus between firms and customers?

This Unit

- Model of interactions between **customers and profit-maximising firms** producing differentiated products
- Factors that affect the firm's choice of price and quantities produced (**costs, price elasticity, market power**)
- **Surplus**: measuring the **gains from trade**

B. Production: Key concepts

Describing production: Economies of Scale

- A firm's costs depend on its scale of production and the type of production technology it has.
- Large firms can be more profitable than small firms because of technological and/or cost advantages.

If inputs increase by a given proportion, and production...	Then the technology exhibits...
Increases more than proportionally	Increasing returns to scale in production Economies of scale
Increases proportionally	Constant returns to scale in production
Increases less than proportionally	Decreasing returns to scale in production Diseconomies of scale

Economies of Scale: Examples

Economies of scale includes:

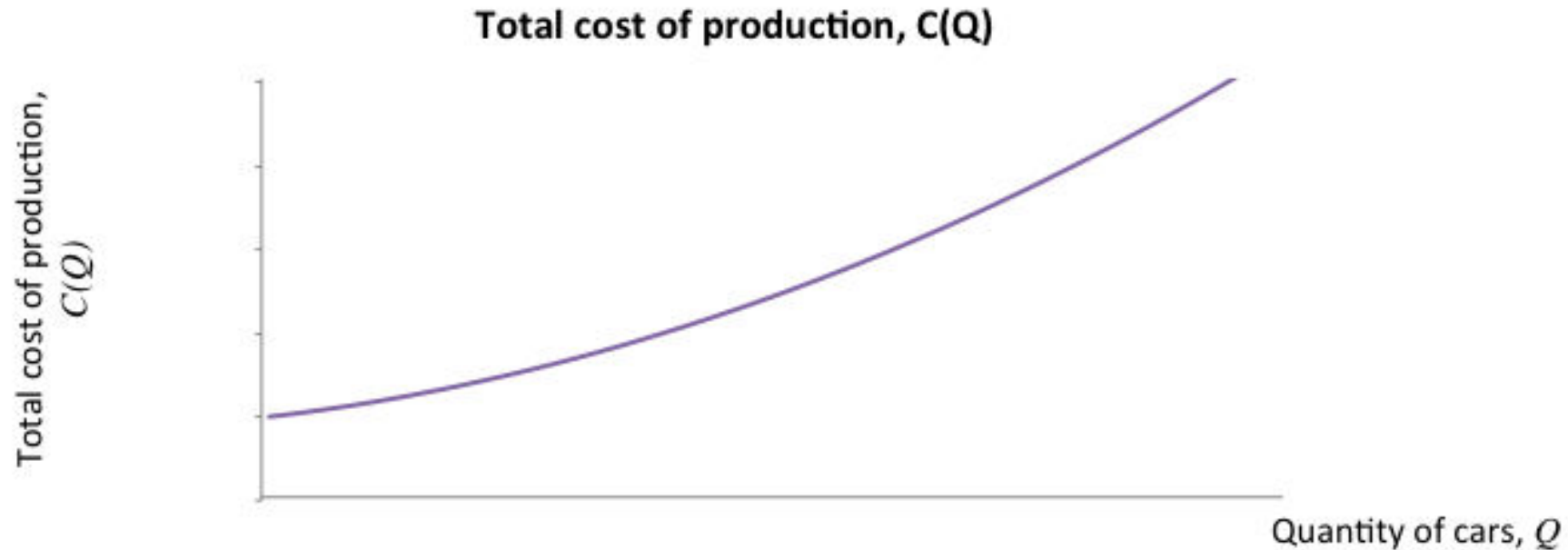
- Cost advantages – Large firms can purchase inputs on more favourable terms, because they have greater bargaining power when negotiating with suppliers.
- Demand advantages - **Network effects** (value of output rises with number of users e.g. software application)

However, large firms can also suffer from **diseconomies of scale**, e.g. additional layers of bureaucracy due to too many employees.

Cost functions

To make pricing and production decisions, managers need to know the costs of production.

Cost functions show how total production costs vary with quantity produced.



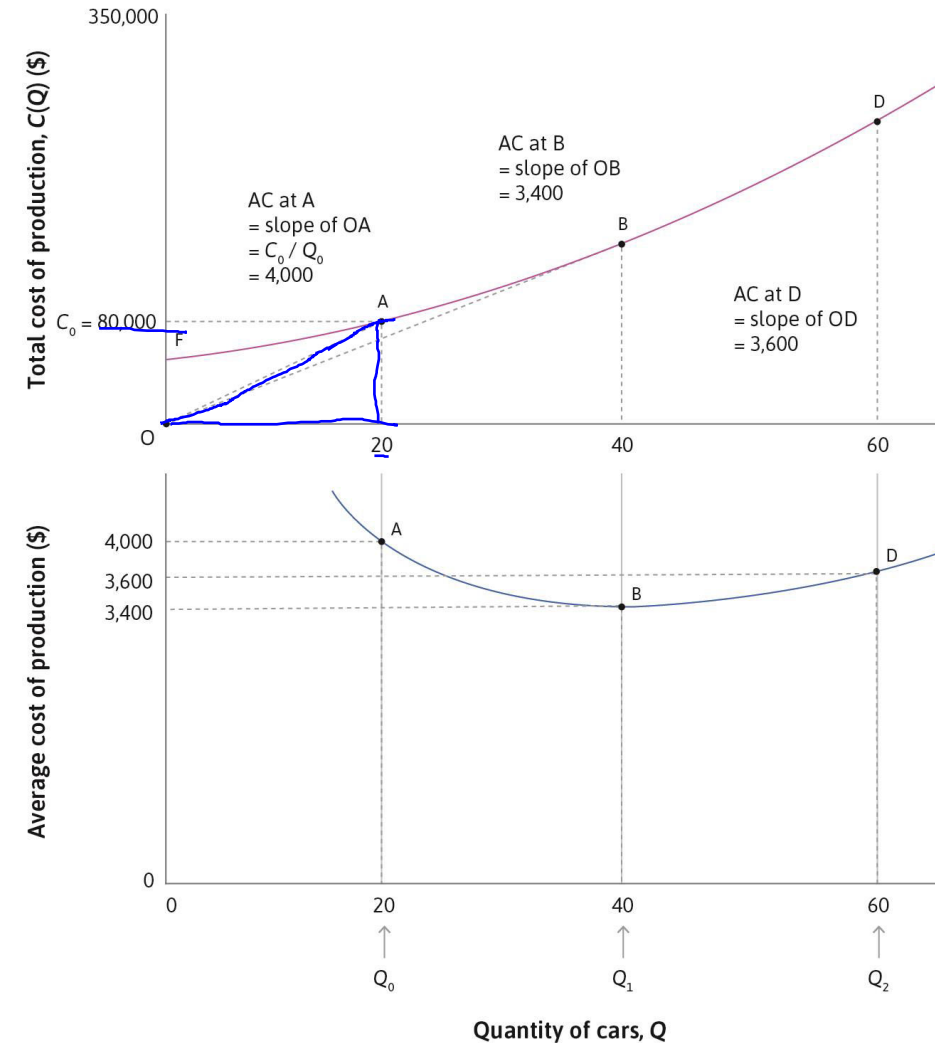


Average cost

Average cost (AC): Average cost per unit produced.

- Calculated as the slope of the ray from the origin to a given point on the cost function.

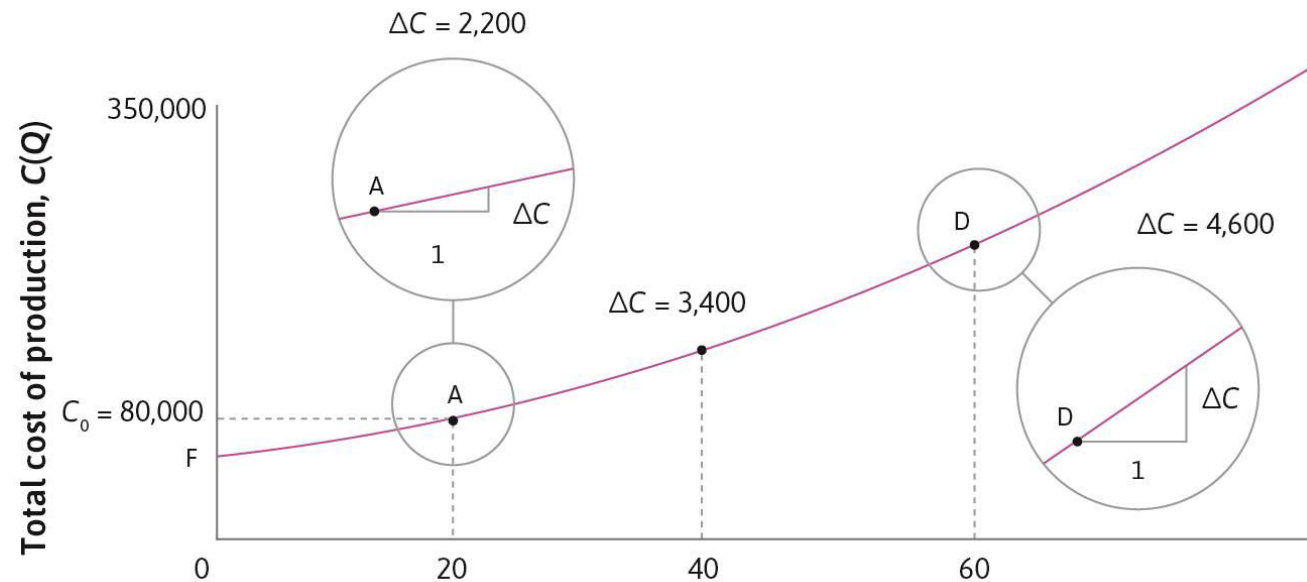
In this example, average costs decrease at first (economies of scale) but then increase (e.g. overtime, machine breakdown).



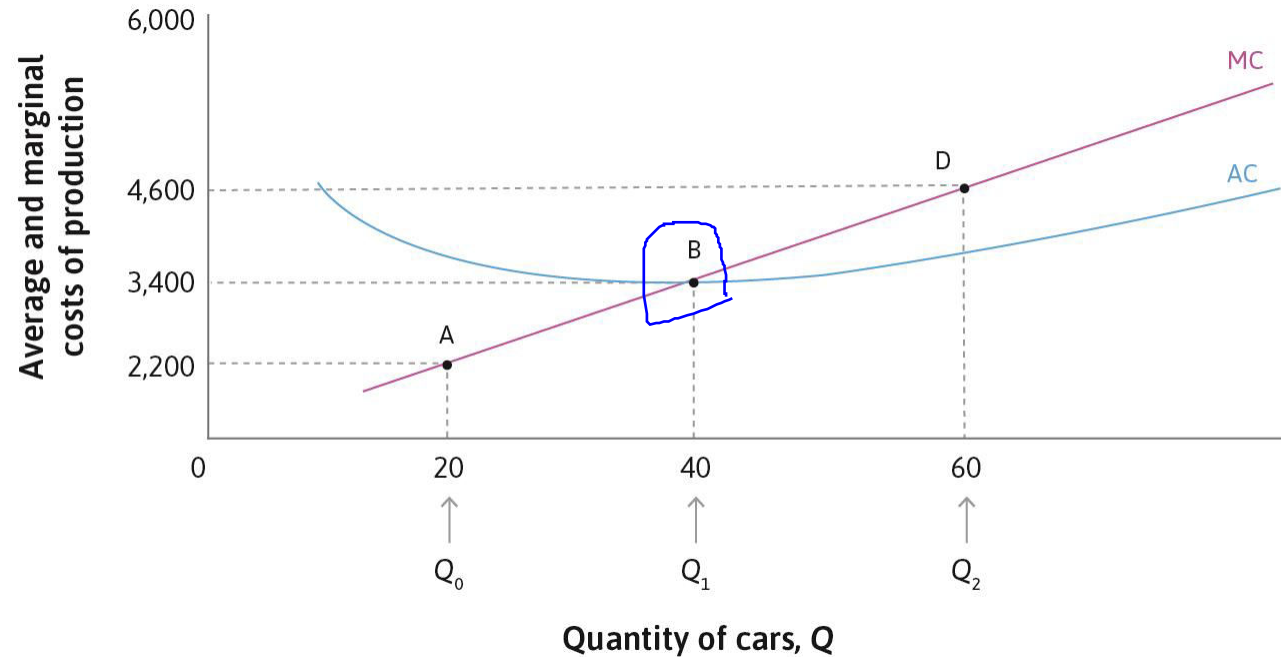
Marginal cost

Marginal cost (MC): the effect on total cost of producing one additional unit of output.

- Calculated as the slope of the cost function at a given point. In this example, marginal costs increase with production.



Relationship between MC and AC



The following statements are always true:

- If $AC > MC$: AC is decreasing. If $AC < MC$: AC is increasing.
- The MC curve always intersects the AC curve at its lowest point.

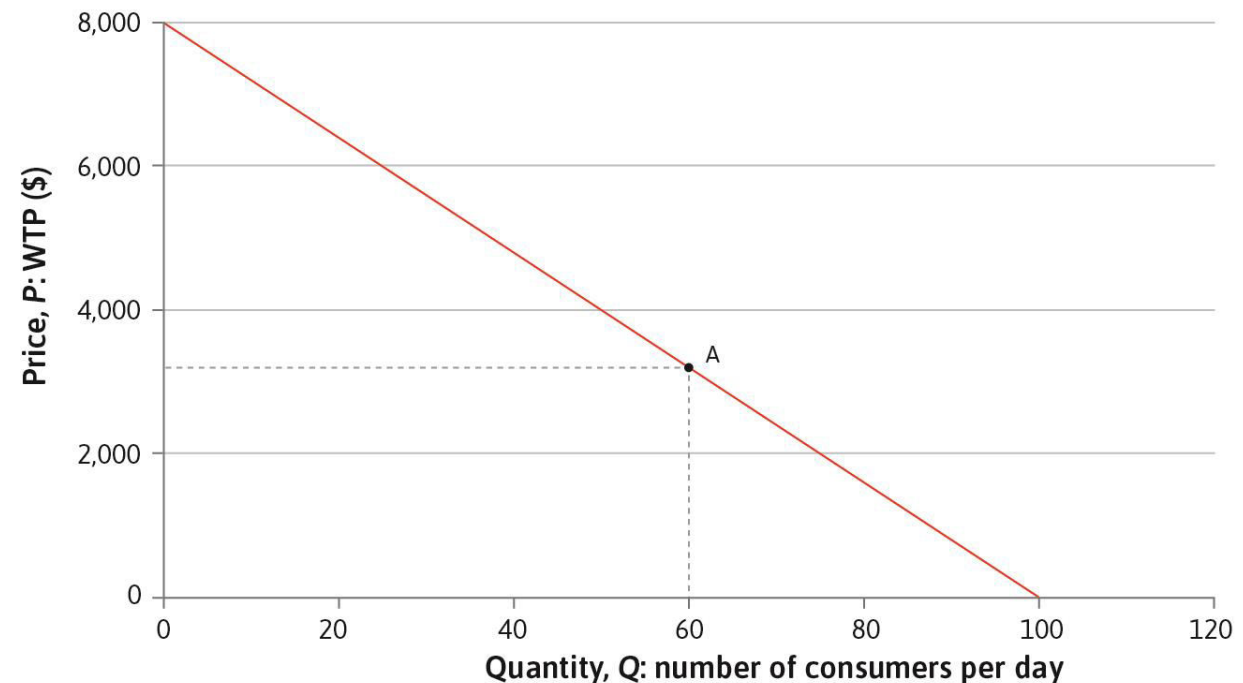
C. Pricing and Production Decisions: Profit maximization

Demand curve

To make pricing and production decisions, managers also need to know the demand for the firm's product.

Demand curve = quantity that consumers will buy at each price.

In theory, firms can **estimate the demand curve** for their product by surveying a large number of consumers.

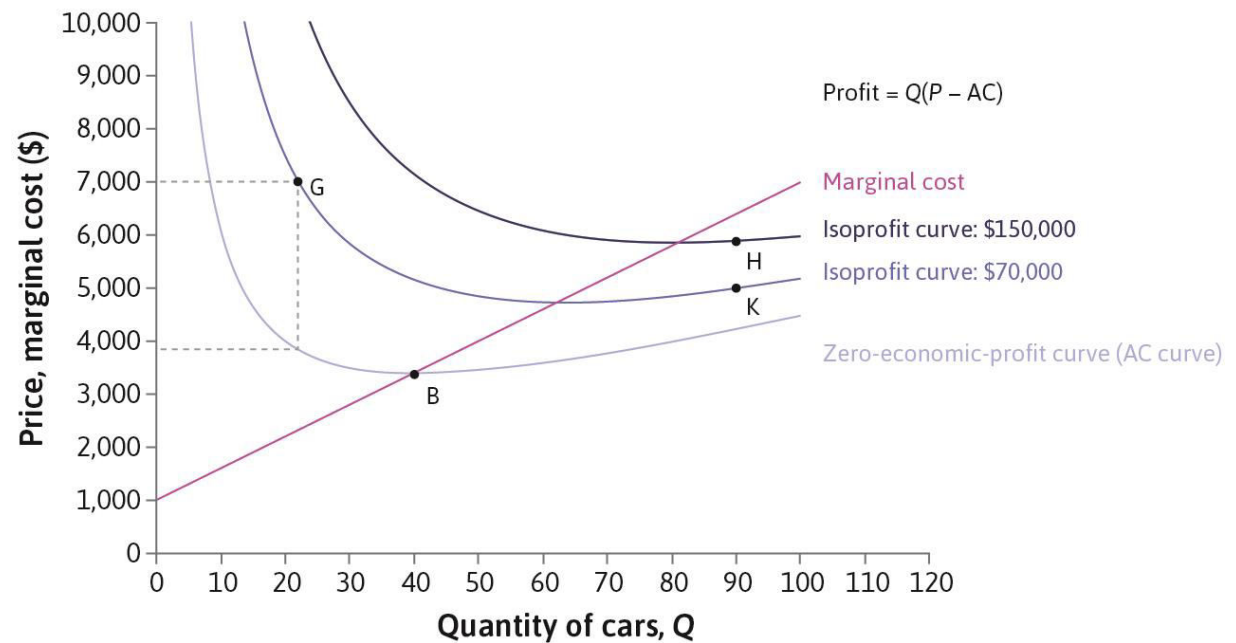


Isoprofit curve

(Economic) Profit = Total revenue – Total costs
(Costs include the opportunity cost of capital)

Isoprofit curves show price-quantity combinations that give the same profit.

The shape of a firm's cost function affects the shape of their isoprofit curves.

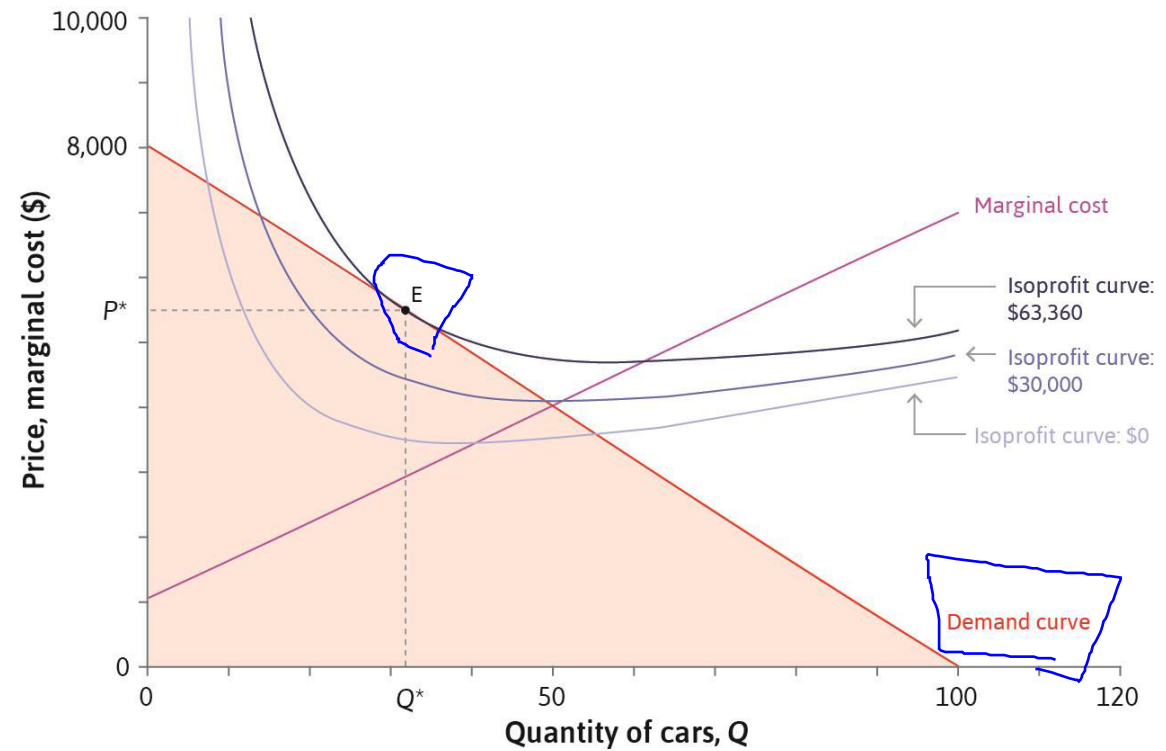


Profit maximisation

The firm's **constrained optimization problem** is analogous to the consumer's from Unit 3.

- **Demand curve** = Firm's feasible frontier (slope = MRT)
- **Isoprofit curves** = Firm's indifference curves (slope = MRS)

Firm maximizes profits by choosing point where **MRS = MRT**

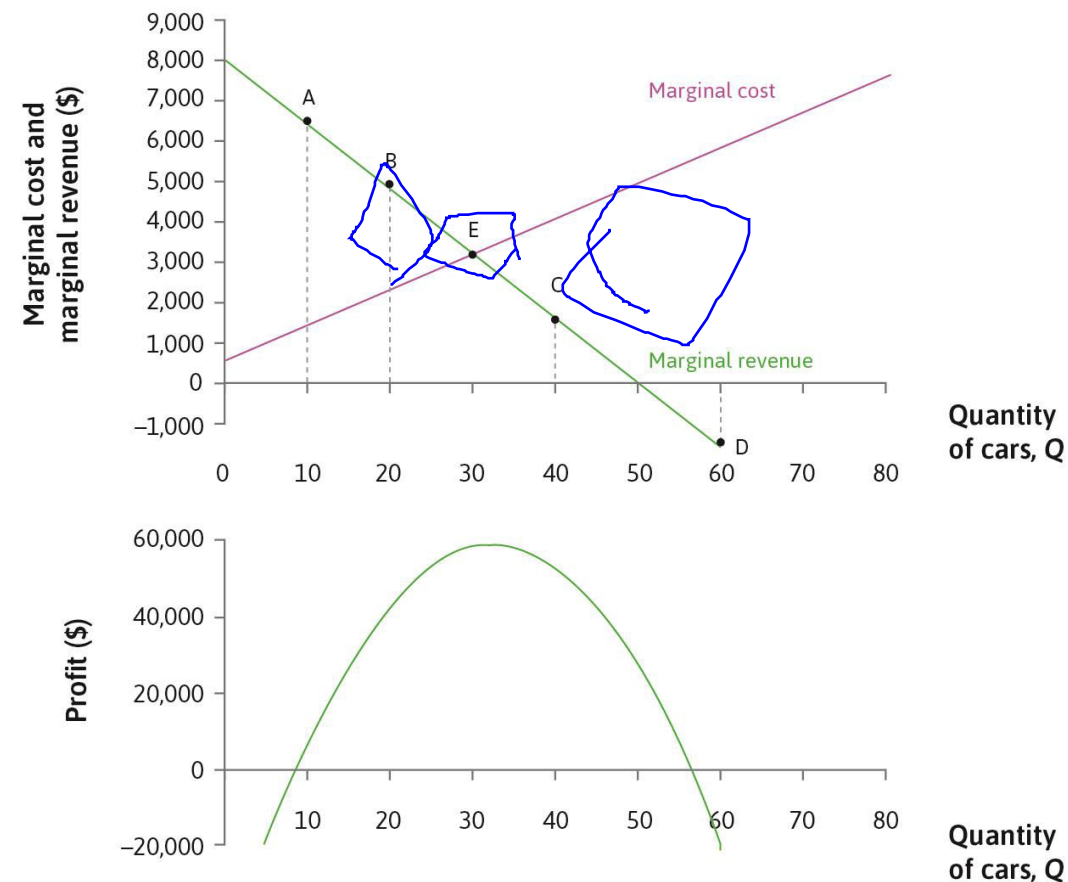


Profit Maximization

Profit-maximization can also be described in terms of revenue and costs.

Marginal revenue (MR) = change in revenue from **selling an additional unit** (net effect of decreasing price and increasing quantity sold)

Firm maximizes profits by choosing point where **MR = MC**



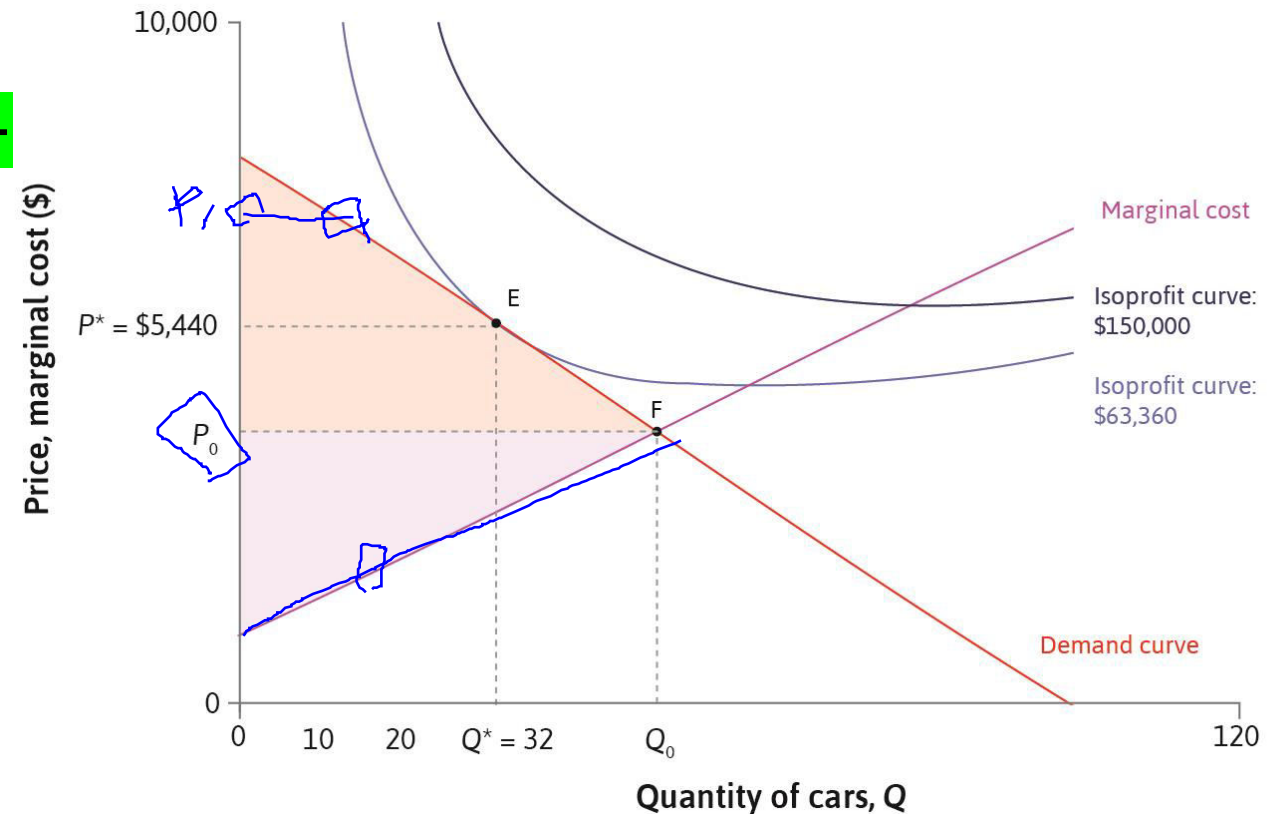
D. Gains from Trade

Measuring Surplus

Consumer surplus (CS) = the total difference between willingness-to-pay and purchase price

Producer surplus (PS) = the total difference between revenue and marginal cost

(Profit = PS – fixed costs)

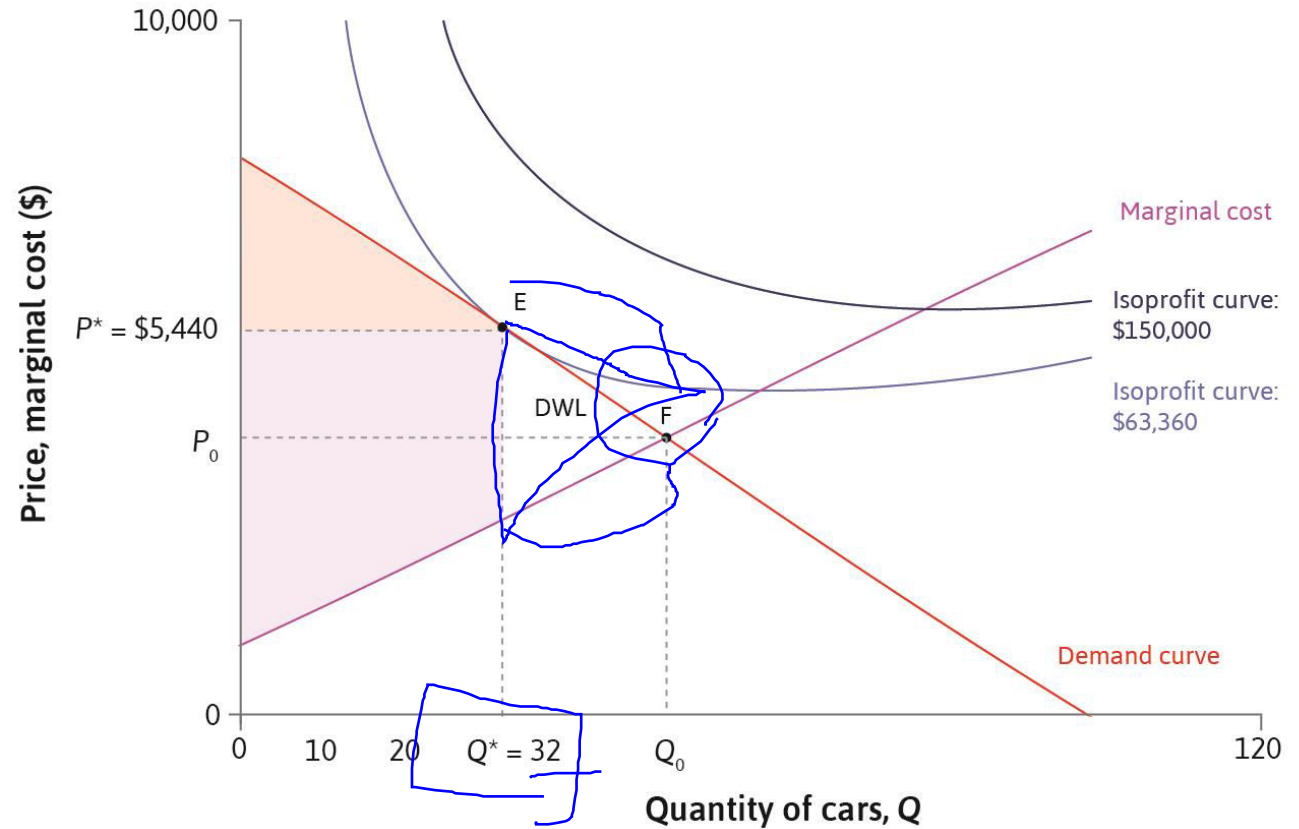


Total surplus = Consumer surplus + Producer surplus
= Total gains from trade (shaded area)

Deadweight Loss

Deadweight loss = a loss of total surplus relative to a Pareto efficient allocation (unexploited gains from trade)

Total surplus is **highest when Demand = Marginal Cost**
(Pareto efficient allocation)



E. Price Elasticity of Demand

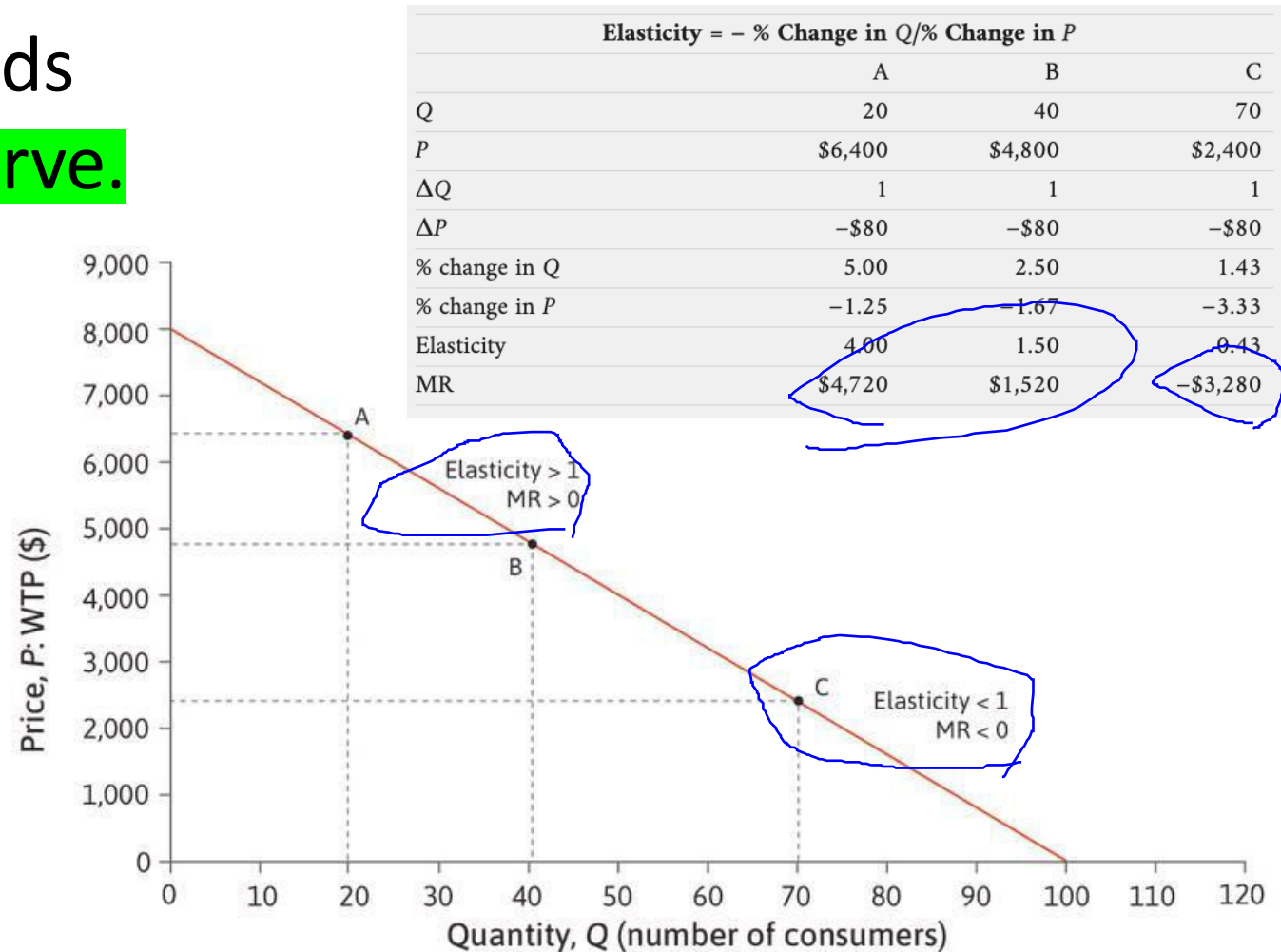
Price Elasticity of Demand

A firm's pricing decision depends on the **slope of the demand curve**.

Price elasticity of demand = degree of **responsiveness** (of consumers) to a price change.

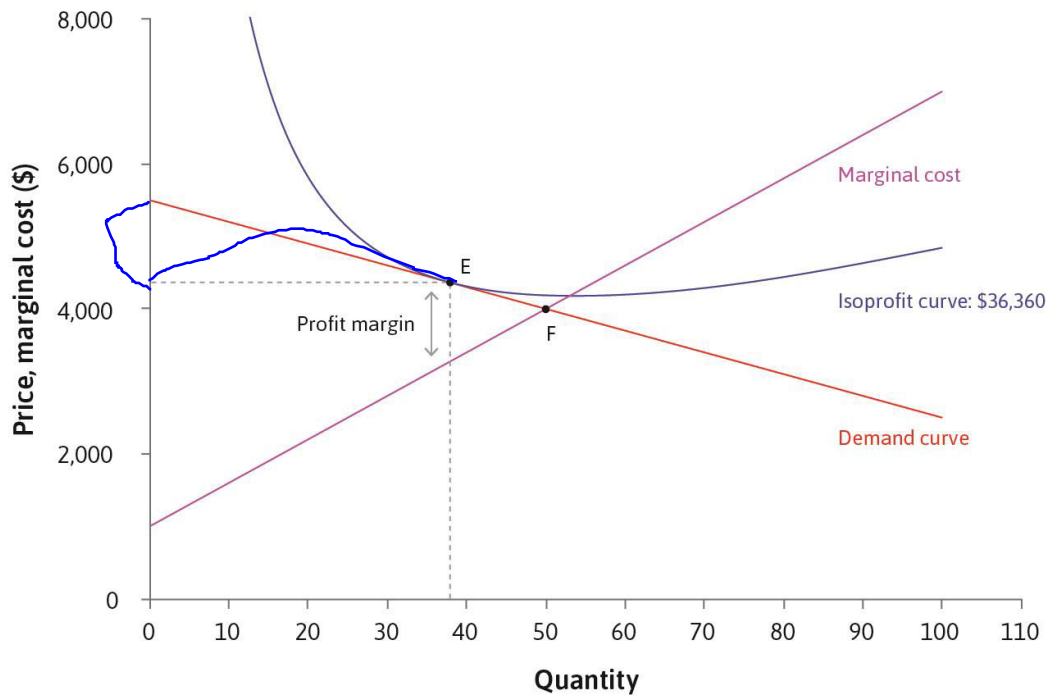
$$\epsilon = \frac{-\% \text{ change in demand}}{\% \text{ change in price}}$$

MR is always positive when demand is elastic.

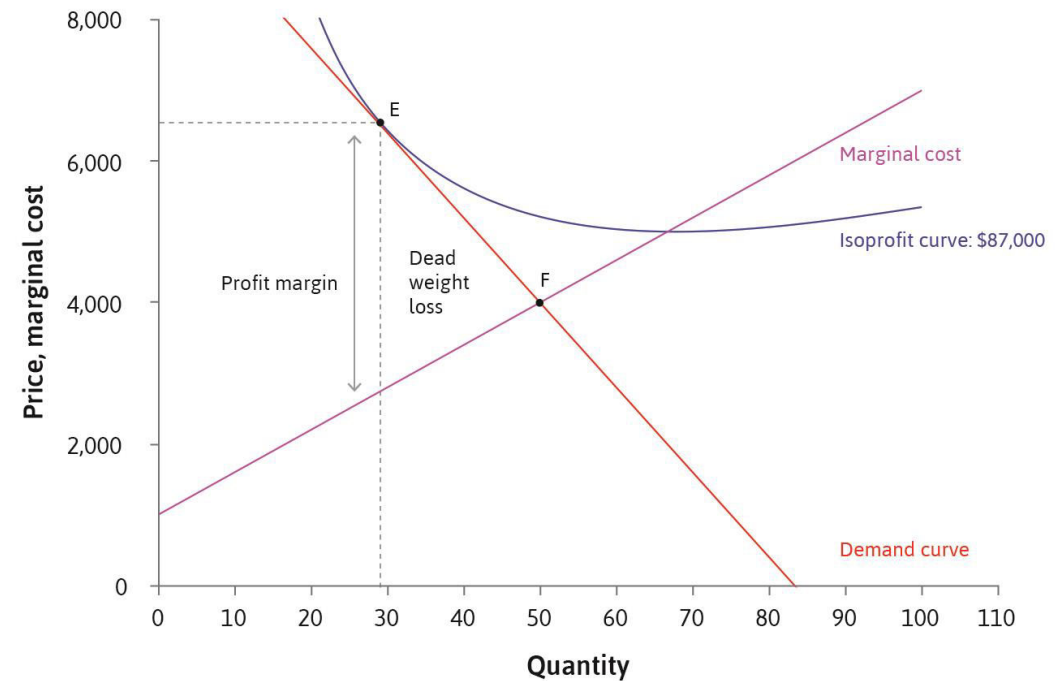


Price Elasticity and Profits

A firm's **markup** (profit margin as a **proportion of the price**) is inversely proportional to price elasticity of demand.



Elastic demand



Inelastic demand

Price Elasticity and Policy

- The effect of good-specific taxes depends on the elasticity of demand for those goods.
- Governments raise more tax revenue by **levying taxes on price-inelastic goods.**
- Several countries e.g. Denmark and France have introduced taxes on unhealthy foods – to reduce consumption not to raise revenue.

Category	Type	Calories per serving	Price per 100 g (\$)	Typical spending per week (\$)	Price elasticity of demand
1	Fruit and vegetables	660	0.38	2.00	1.128
2	Fruit and vegetables	140	0.36	3.44	0.830
15	Grain, pasta, bread	1,540	0.38	2.96	0.845
17	Grain, pasta, bread	960	0.53	2.64	0.292
28	Snacks, candy	433	1.13	4.88	0.270
29	Snacks, candy	1,727	0.68	7.60	0.295
30	Milk	2,052	0.09	2.32	1.793
31	Milk	874	0.15	1.44	1.972

Price Elasticity and Market Power

A firm's profit margin depends on the elasticity of demand, which is determined by competition:

- Demand is relatively **inelastic** if there are **few** close **substitutes**
- Firms with market power have enough bargaining power to set prices without losing customers to competitors

Competition policy (limits on market power) can be beneficial to consumers when firms collude to keep prices high.

Market Power: Monopolies

Example of market power: A firm selling specialized products.

- They face **little competition** and hence have inelastic demand.
- They can set **price above marginal cost** without losing customers, thus earning **monopoly rents**.
- This is **a form of market failure** because there is deadweight loss.

A **natural monopoly** arises when one firm can produce at lower average costs than two or more firms e.g. utilities.

Instead of encouraging competition, policymakers may put price controls or make **these firms publicly owned**.

Gaining market power

Firms can increase their market power by:

Thomas Sowell

- **Innovating** – Technological innovation can allow firms to differentiate their products from competitors' e.g. hybrid cars. Firms that invent a completely new product may prevent competition altogether through **patents or copyright laws**.
- Advertising – Firms can attract consumers away from competing products and create **brand loyalty**. Advertising can be more effective than discounts in increasing demand for a brand.

Both of these tactics can shift the firm's demand curve.

Summary

1. Model of a firm with **market power** (price-setter)
 - Price and production decisions depend on a firm's demand curve and cost function.
 - Profit-maximising choice where **MRS = MRT**
 - Or, in terms of revenue and costs, where **MR = MC**
2. Surplus measures the gains from trade
 - **Total surplus = Producer surplus + Consumer surplus**
 - **Deadweight loss** when allocation not Pareto efficient
 - **Price elasticity of demand** affects surplus and profits

In the next unit

- Model of supply and demand interactions under **perfect competition** (no market power)
- Determinants of competitive equilibrium
- Similarities and differences between price-**taking** and price-**setting** firms