Important diagrams to remember

Chapter 2 Competitive markets: demand and supply
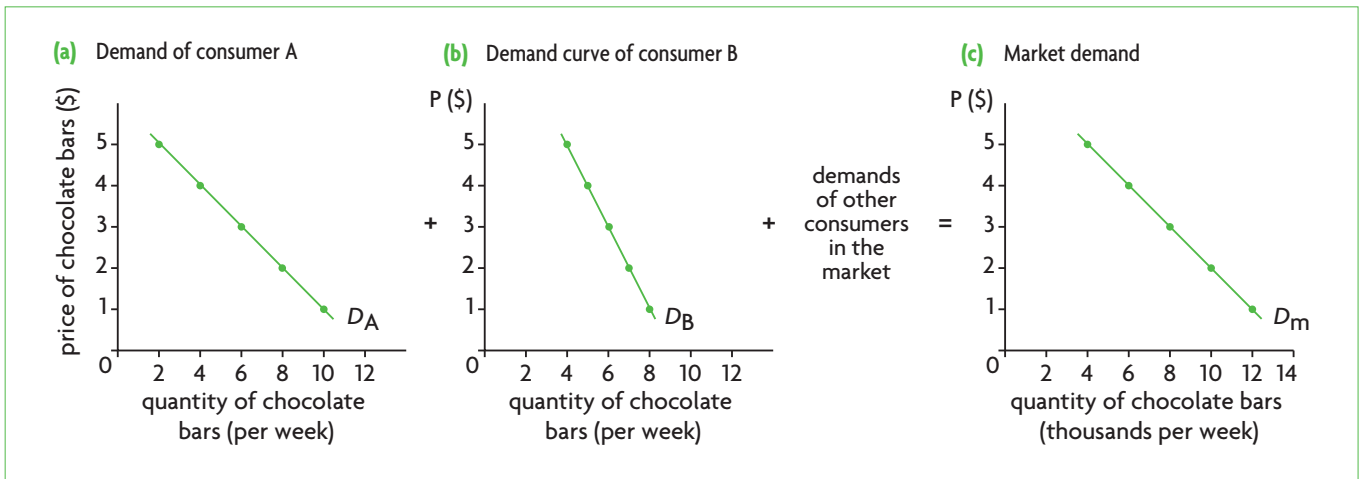
(a) Demand of consumer A

(b) Demand curve of consumer B

(c) Market demand

price of chocolate bars ($)

P ($)

P ($)

D_A

D_B

D_m

+ demands of other consumers in the market =

quantity of chocolate bars (per week)

quantity of chocolate bars (per week)

quantity of chocolate bars (thousands per week)

Figure 2.2 Market demand as the sum of individual demands

(a) A movement along the demand curve, caused by a change in price, is called a 'change in quantity demanded'

P

P_1

P_2

A

B

D

change in quantity demanded

0 Q_1 Q_2 Q

(b) A shift of a demand curve, caused by a change in a determinant of demand, is called a 'change in demand'

P

change in demand

decrease in D

increase in D

D_3 D_1 D_2

0 Q
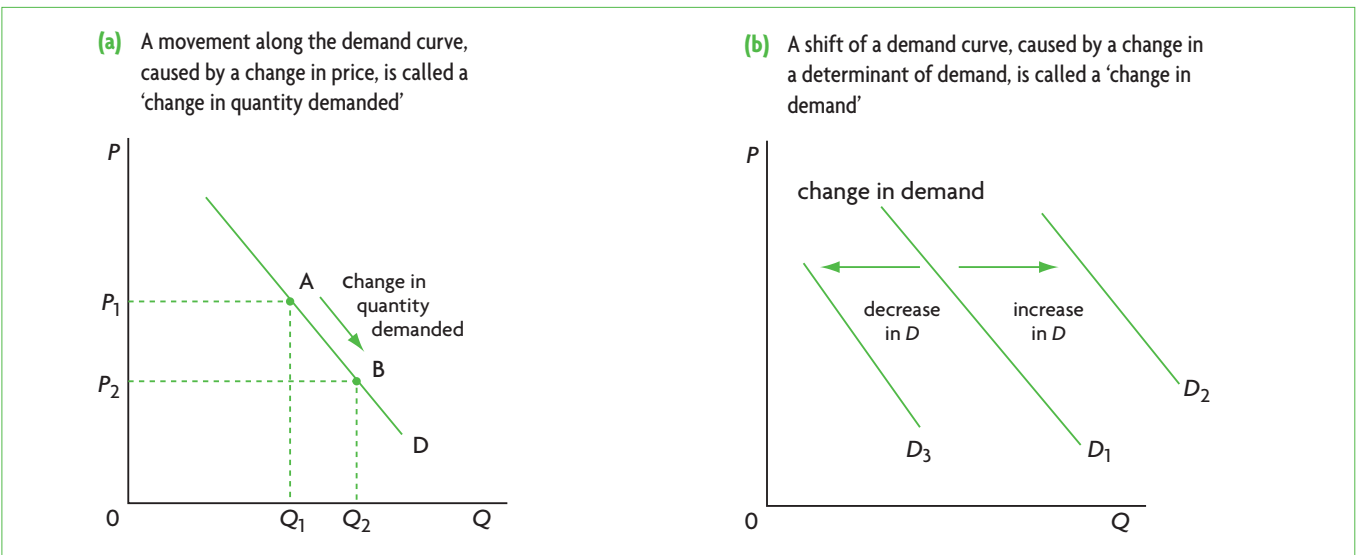
Figure 2.4 Movements along and shifts of the demand curve

(a) Supply of firm A   **(b)** Supply of firm B   **(c)** Market supply
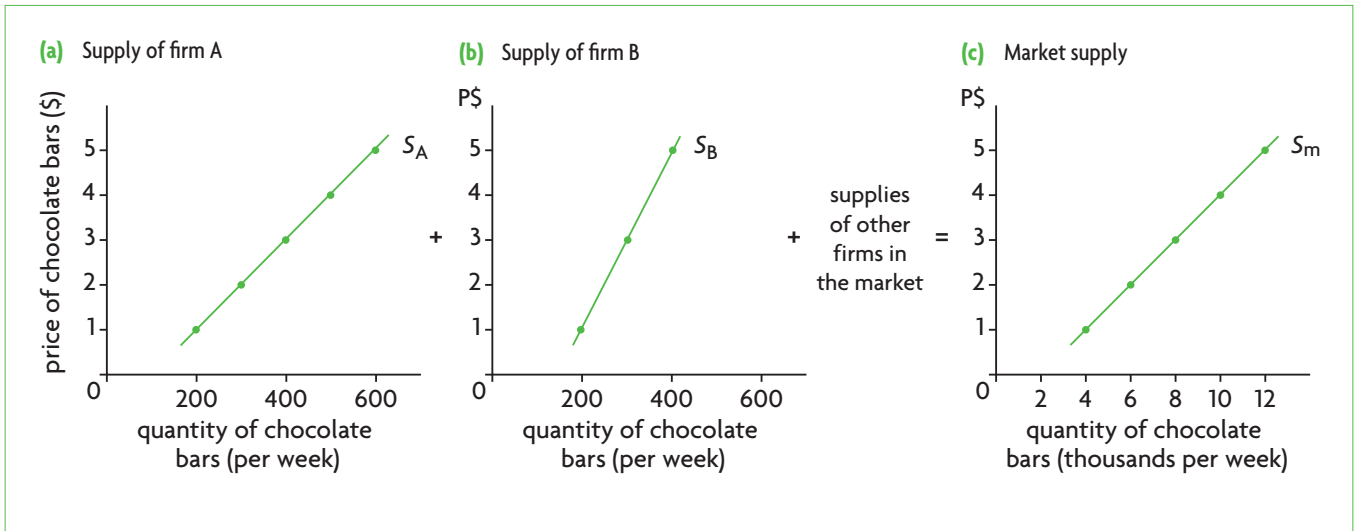
Figure 2.6   Market supply as the sum of individual supplies

(a) A movement along the supply curve, caused by a change in price, is called a 'change in quantity suppied'

(b) A shift of the supply curve, caused by a change in a determinant of supply, is called a 'change in supply'
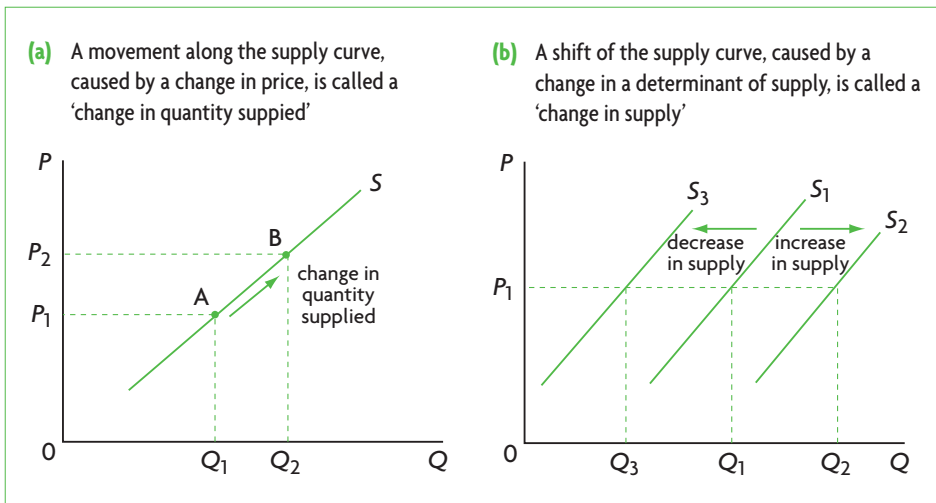
Figure 2.8   Movements along and shifts of the supply curve
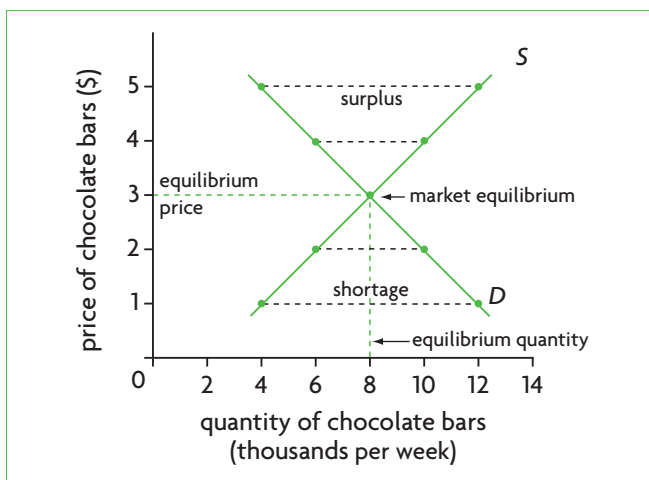
Figure 2.9   Market equilibrium

(a) Increase in demand

(b) Decrease in demand
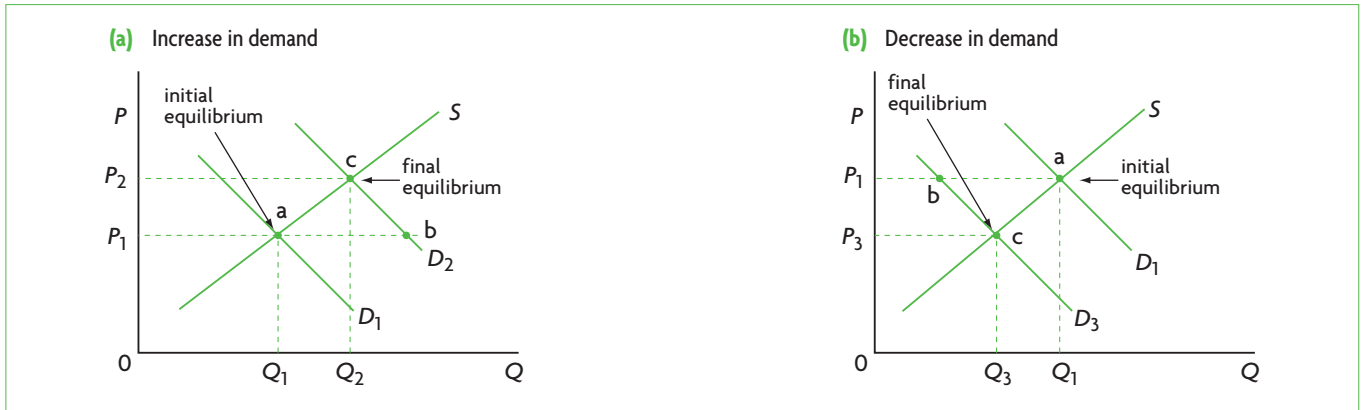
Figure 2.10 Changes in demand and the new equilibrium price and quantity

(a) Increase in supply

(b) Decrease in supply
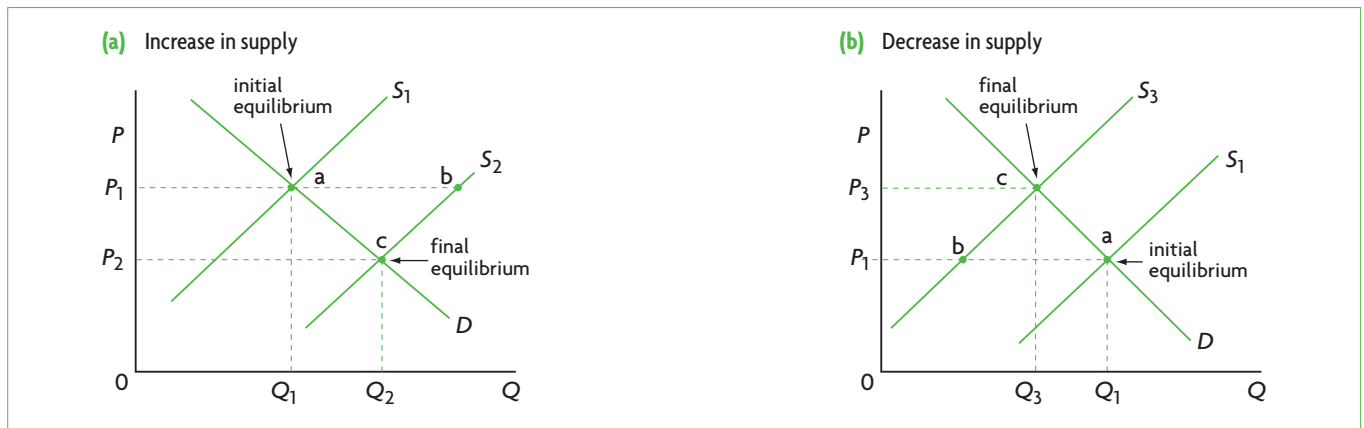
Figure 2.11 Changes in supply and the new equilibrium price and quantity

(a) Adjustment of price to increased demand
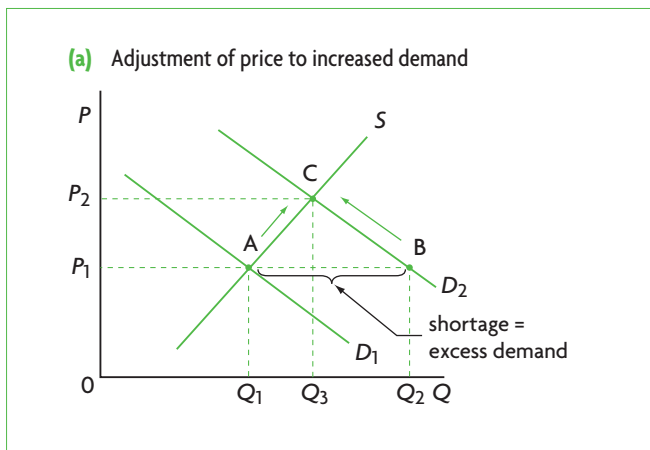
Figure 2.16 Price as a signal and incentive

Allocative efficiency: at market equilibrium $MB = MC$ and social surplus is maximum

consumer surplus
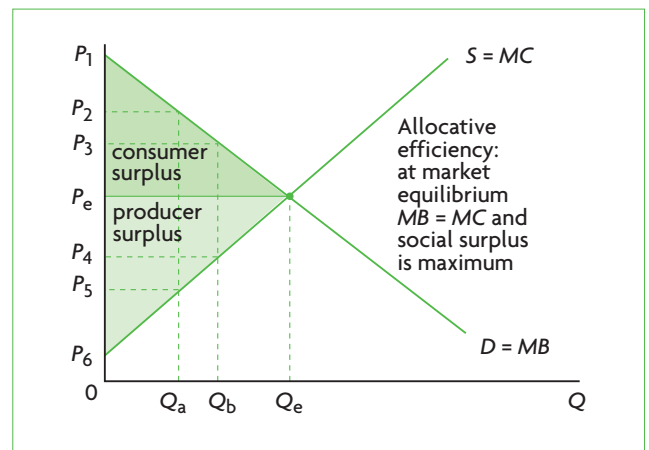
producer surplus

Figure 2.17 Consumer and producer surplus in a competitive market

Higher level topic

P ($)

$Q_d = 14 - 2P$

$Q_d = 19 - 2P$

$Q_d = 10 - 2P$

a decreases   a increases

quantity of chocolate bars (thousands per week)
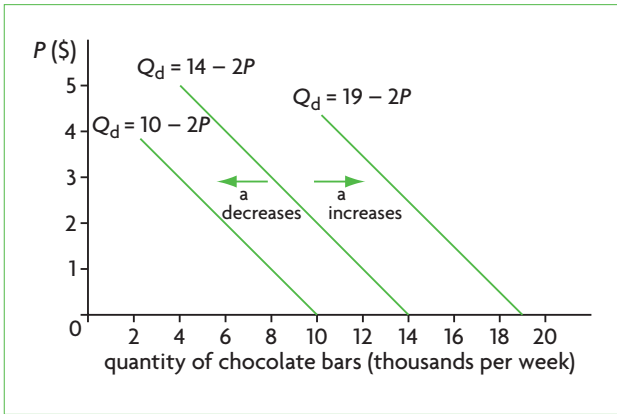
Figure 2.12 Shifts of the demand curve (changes in a in the function $Q_d = a - bP$)

P ($)

$Q_d = 14 - 2P$

$Q_d = 14 - 4P$

absolute value of b increases

quantity of chocolate bars (thousands per week)
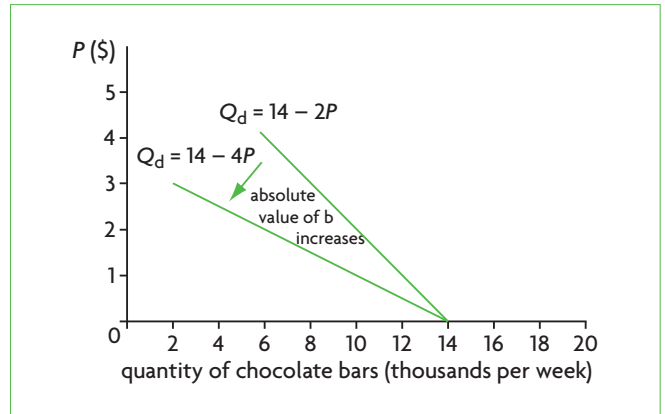
Figure 2.13 Changing the slope of the demand curve (changes in b in the function $Q_d = a - bP$)

P ($)

$Q_s = -1 + 2P$ $Q_s = 2 + 2P$ $Q_s = 6 + 2P$

c decreases   c increases

quantity of chocolate bars (thousands per week)
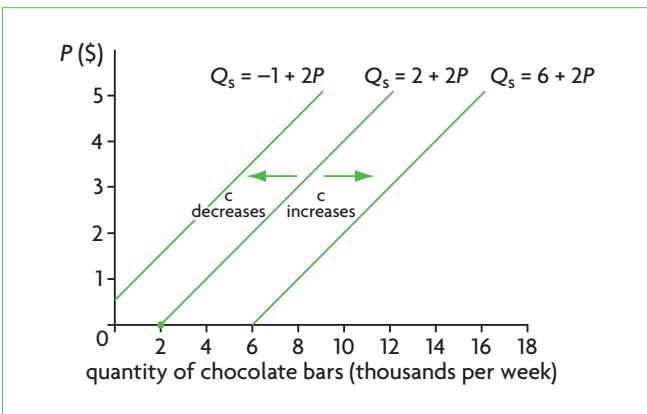
Figure 2.14 Shifts of the supply curve (changes in c in the supply function $Q_s = c + dP$)

P ($)

$Q_s = 2 + 2P$

value of d increases
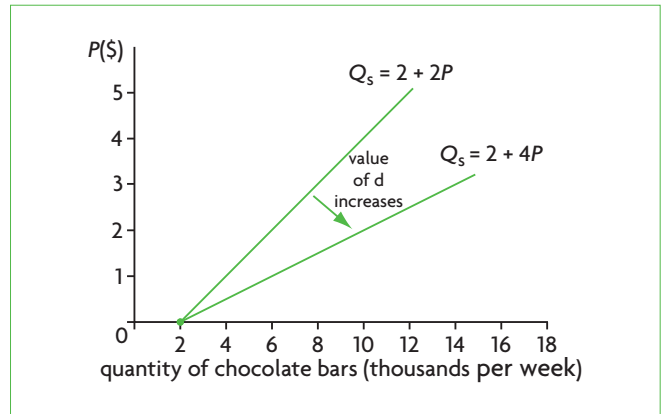
$Q_s = 2 + 4P$

quantity of chocolate bars (thousands per week)

Figure 2.15 Changing the slope of the supply curve (changes in d in the function $Q_s = c + dP$)
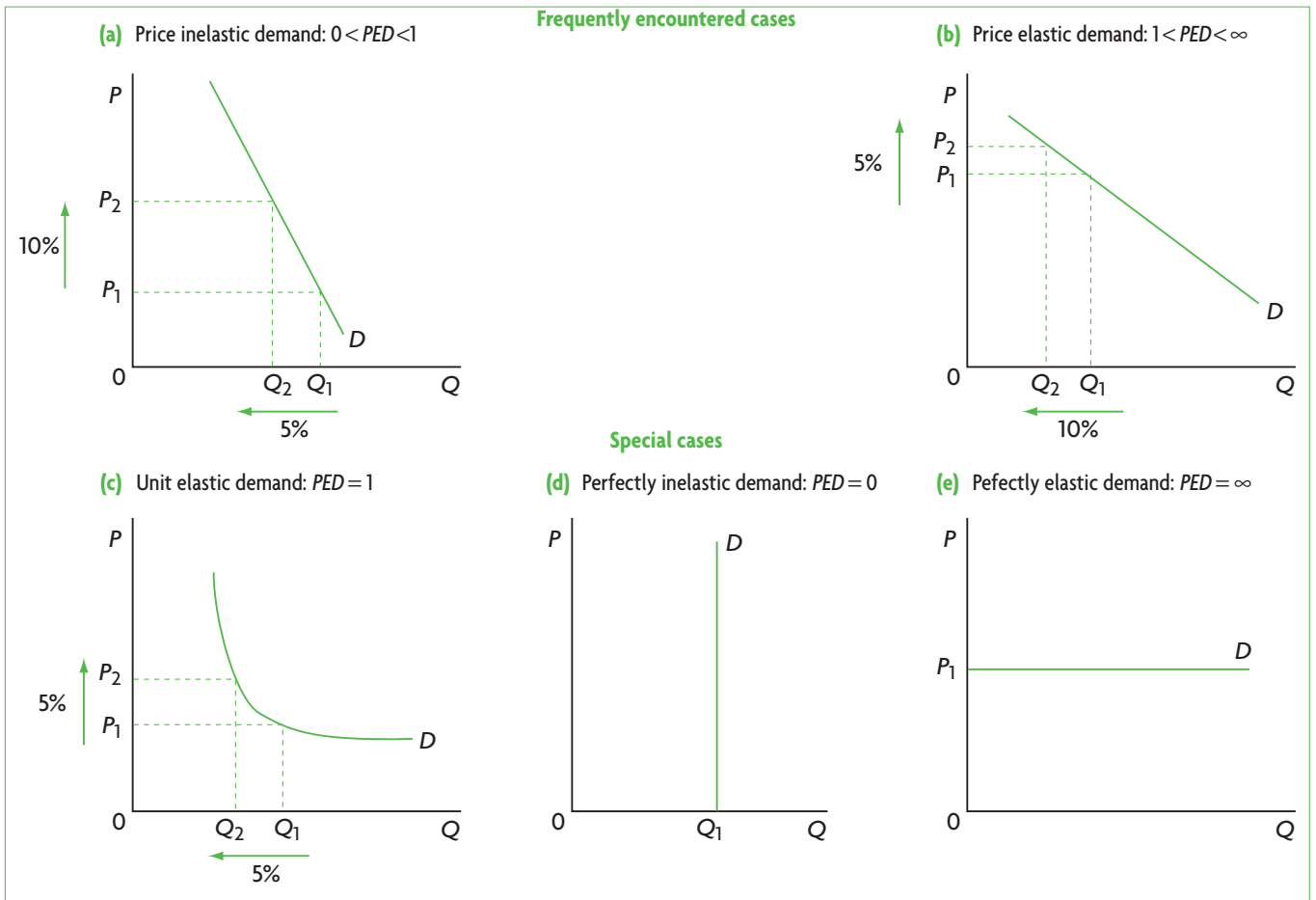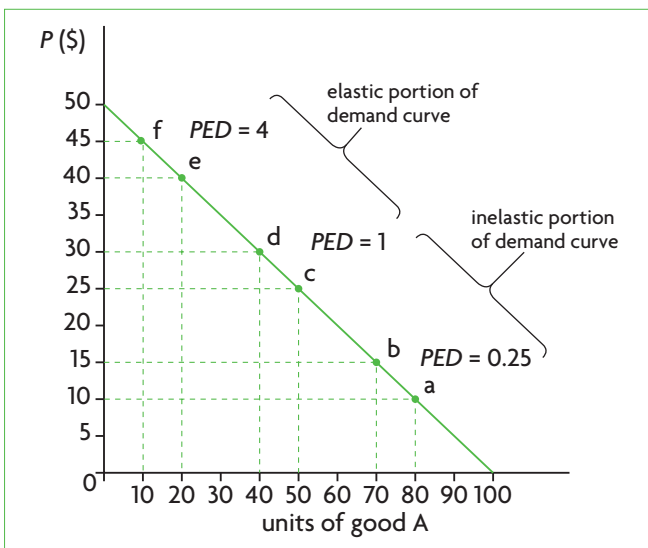
Chapter 3 Elasticities

Frequently encountered cases

(a) Price inelastic demand: $0 < PED < 1$

(b) Price elastic demand: $1 < PED < \infty$

Special cases

(c) Unit elastic demand: $PED = 1$

(d) Perfectly inelastic demand: $PED = 0$

(e) Pefectly elastic demand: $PED = \infty$

Figure 3.1 Demand curves and *PED*

elastic portion of demand curve

$PED = 4$

$PED = 1$

inelastic portion of demand curve

$PED = 0.25$

units of good A

Figure 3.2 Variability of *PED* along a straight-line demand curve
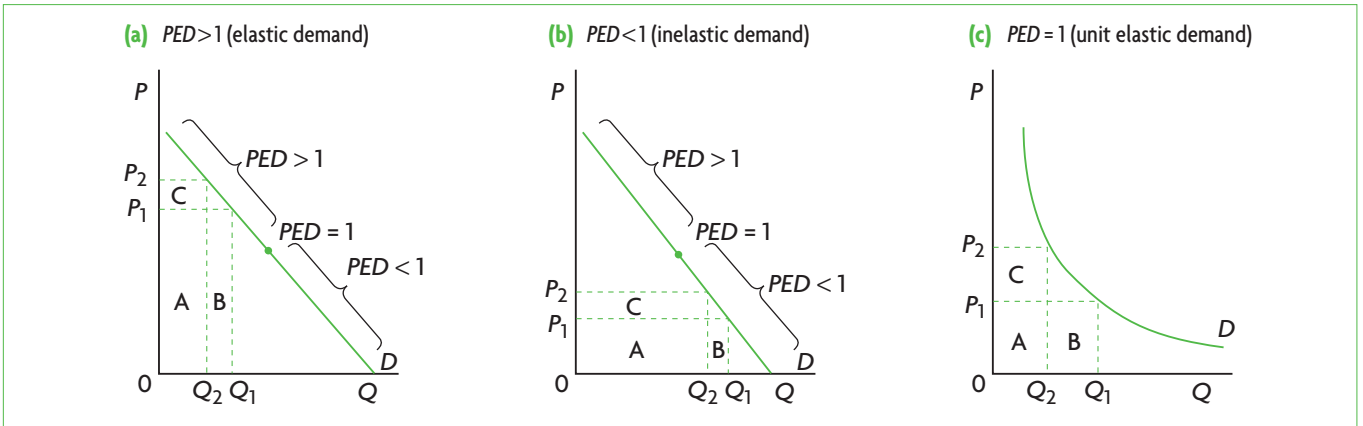
Figure 3.5   *PED* and total revenue
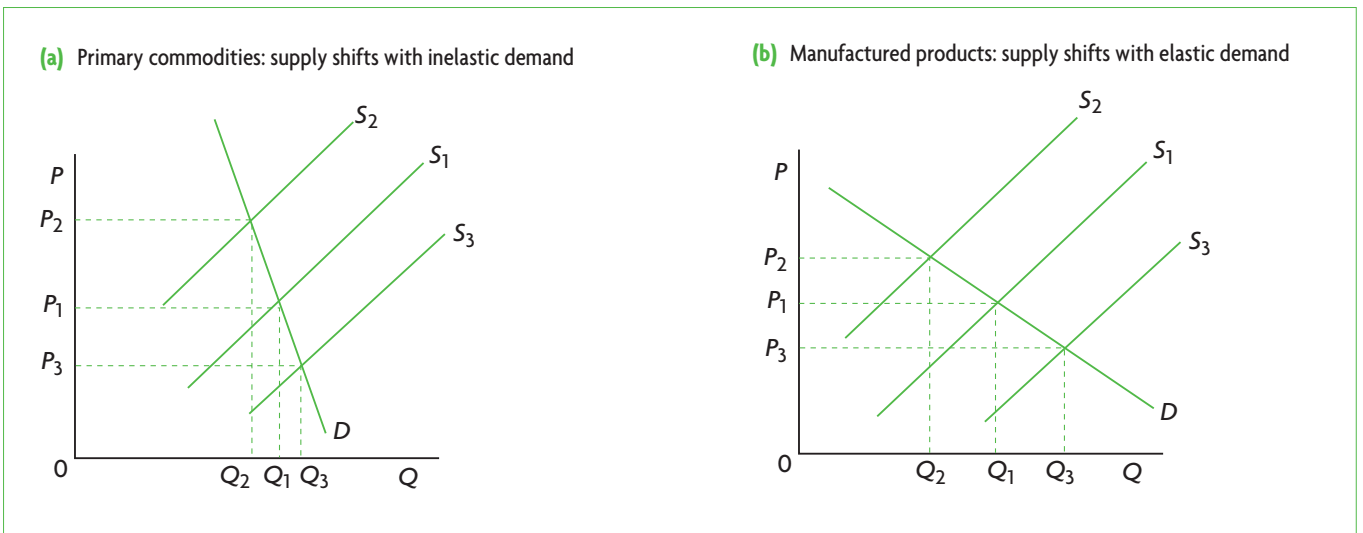
Figure 3.6   Price fluctuations are larger for primary commodities because of low *PED*
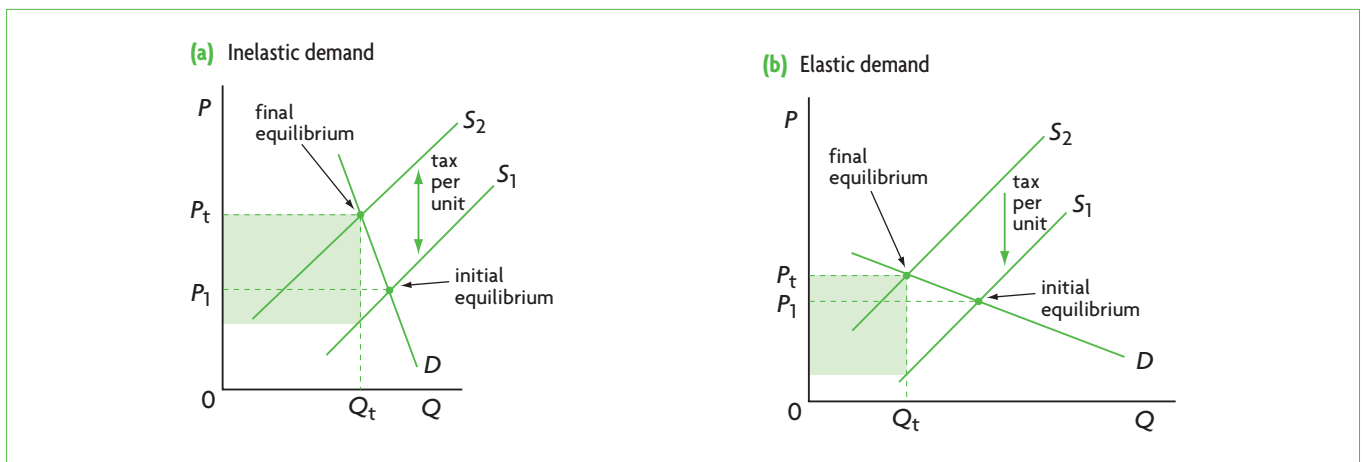
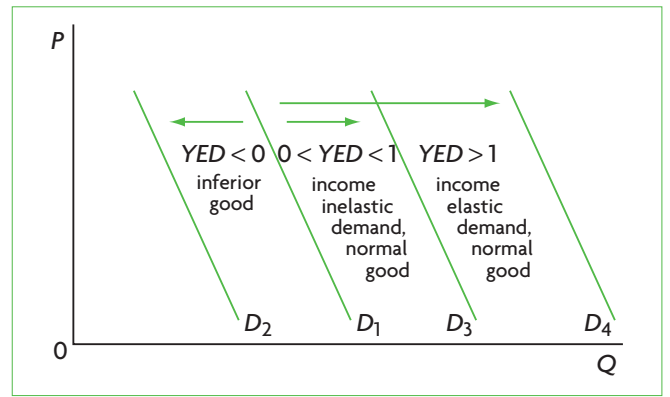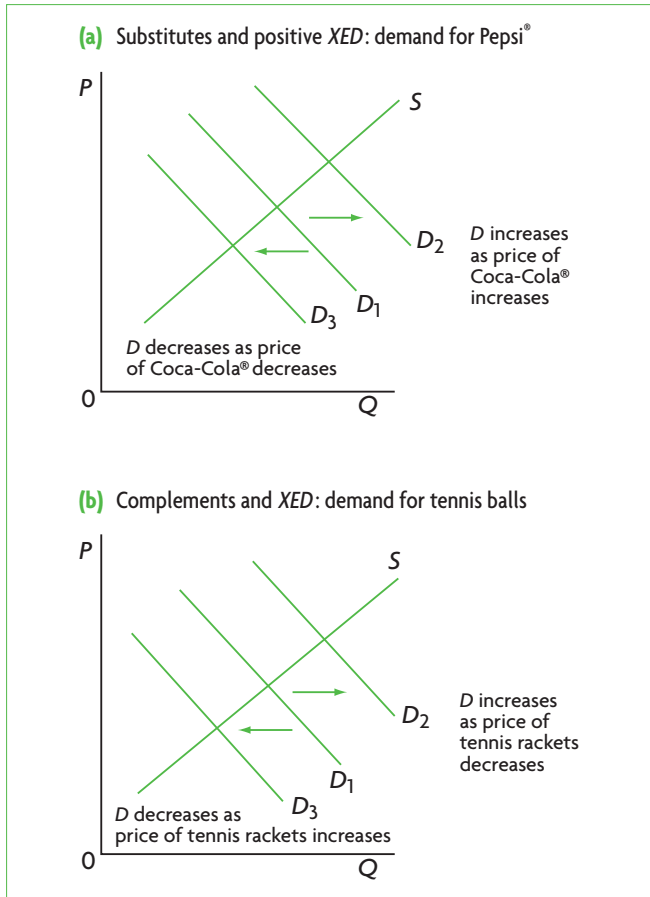Figure 3.7   *PED*, indirect taxes and government tax revenue

(a) Substitutes and positive *XED*: demand for Pepsi®

D increases as price of Coca-Cola® increases

D decreases as price of Coca-Cola® decreases

(b) Complements and *XED*: demand for tennis balls

D increases as price of tennis rackets decreases

D decreases as price of tennis rackets increases

Figure 3.8 Cross-price elasticities

Figure 3.9 Demand curve shifts in response to increases in income for different *YED*s

Frequently encountered cases

(a) Price inelastic supply: *PES* < 1

(b) Price elastic supply: *PES* > 1

Special cases

(c) Unit elastic supply: *PES* = 1

(d) Perfectly inelastic supply: *PES* = 0

(e) Perfectly elastic supply: *PES* = ∞
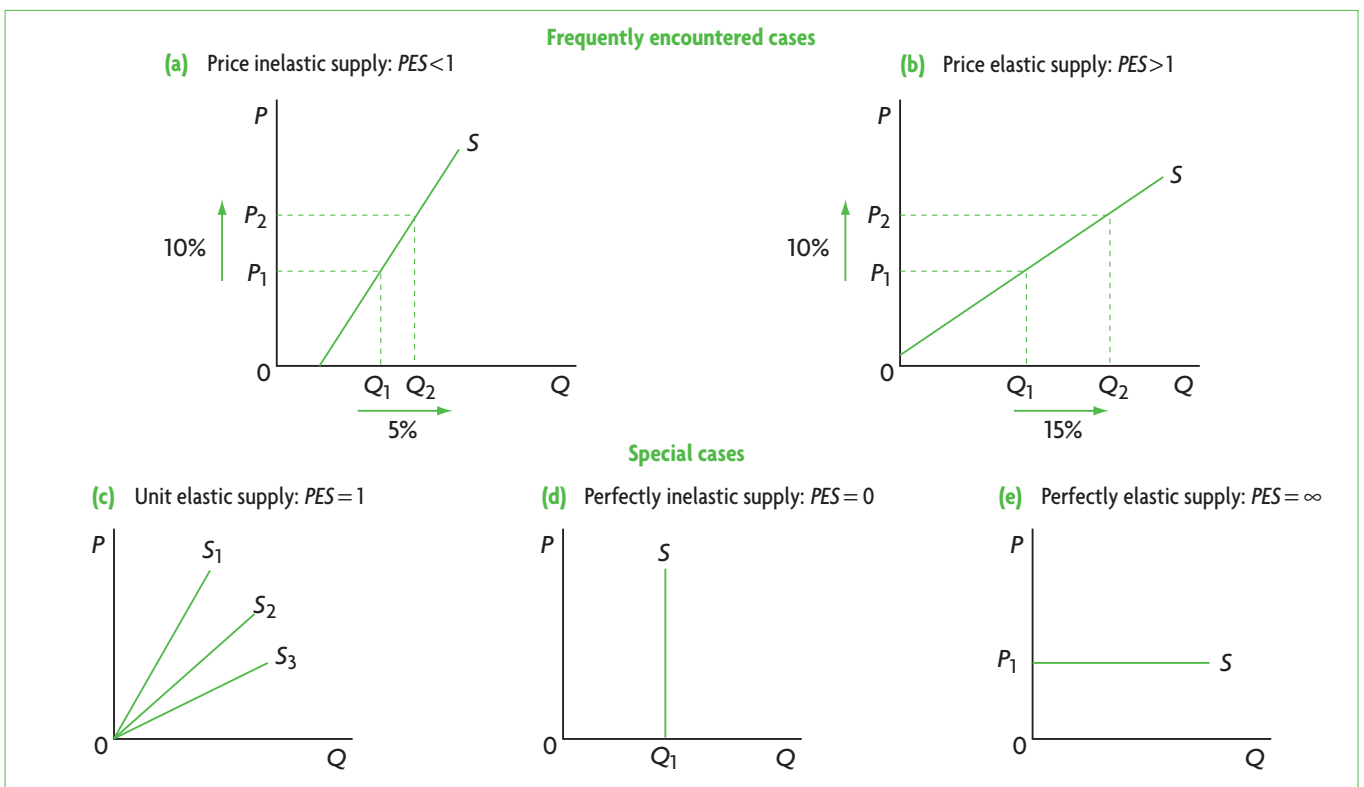
Figure 3.11 Supply curves and *PES*

(a) Primary commodities: demand shifts with inelastic supply

(b) Manufactured products: demand shifts with elastic supply
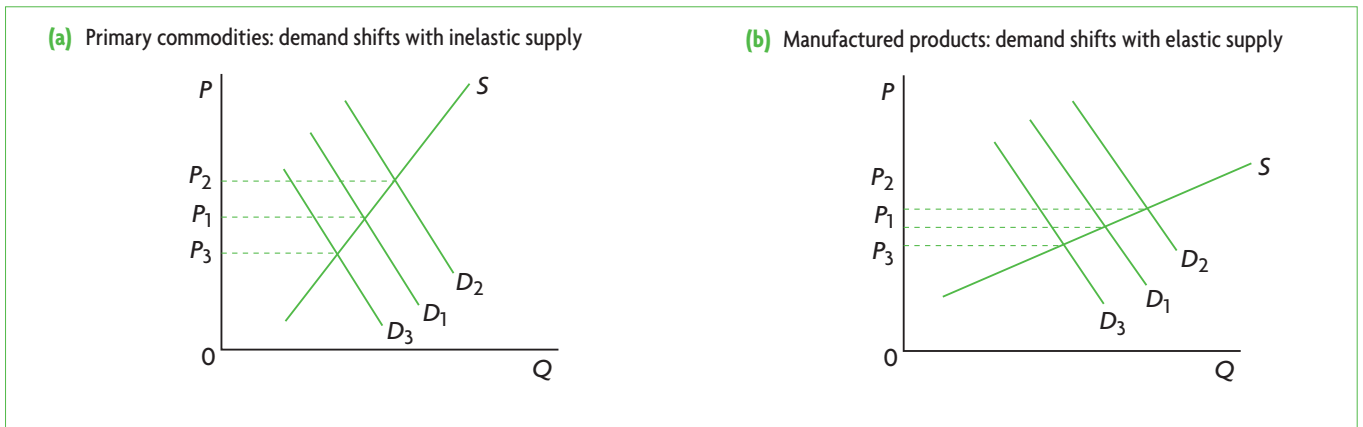
Figure 3.13 Price fluctuations are larger for primary commodities because of low *PES*

Chapter 4 Government intervention

(a) Specific tax
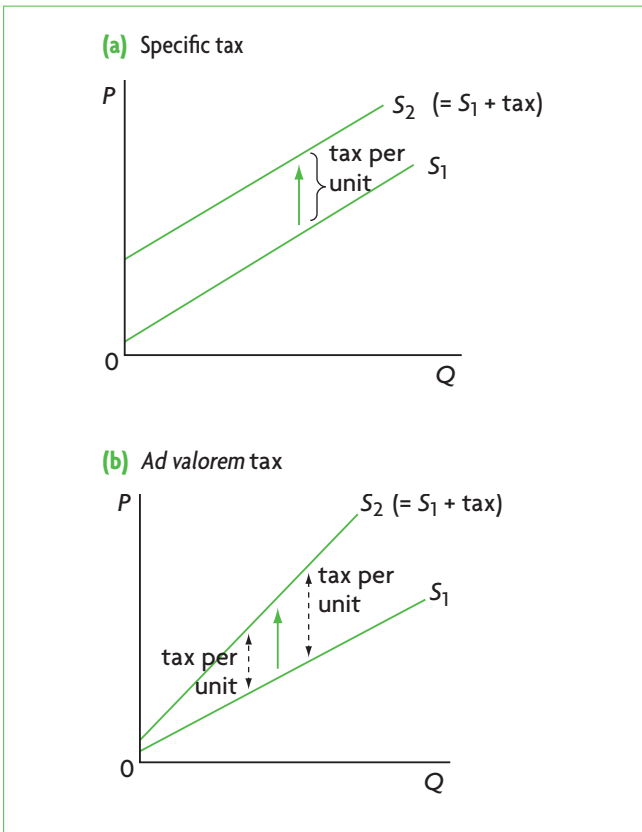

(b) *Ad valorem* tax

Figure 4.1 Supply curve shifts due to indirect (excise) taxes

(a) Market outcomes: specific tax

(b) Market outcomes: *ad valorem* tax
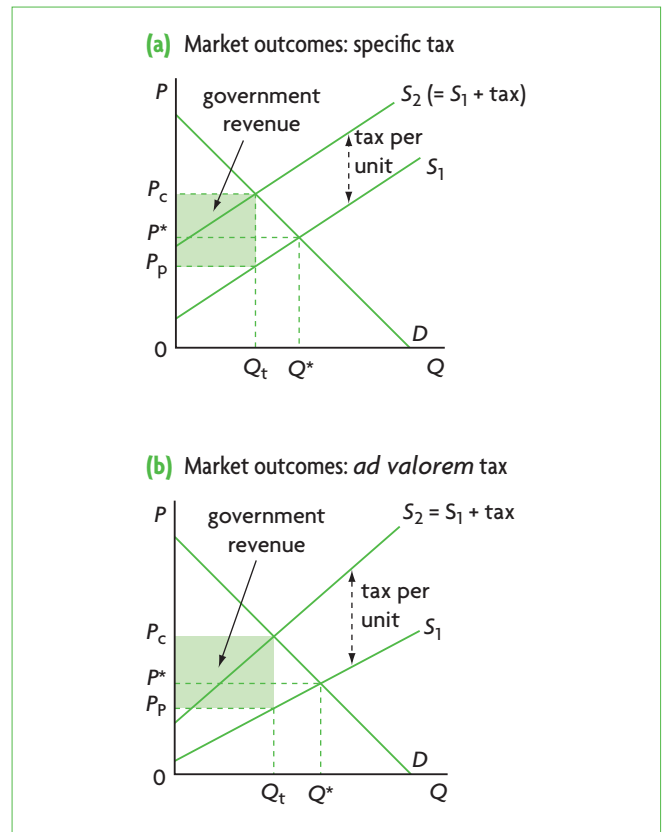
Figure 4.2 Impacts of specific and *ad valorem* taxes on market outcomes
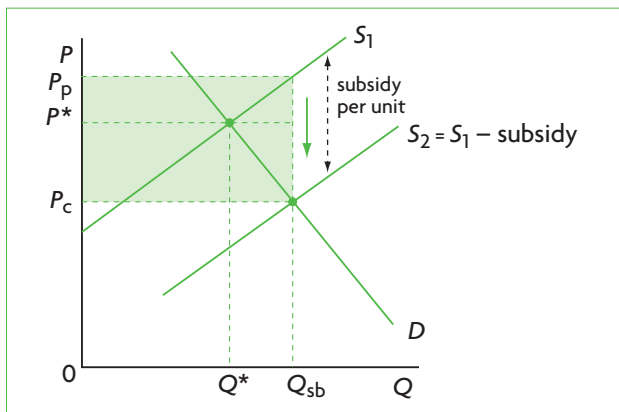
Figure 4.8 Impacts of subsidies on market outcomes
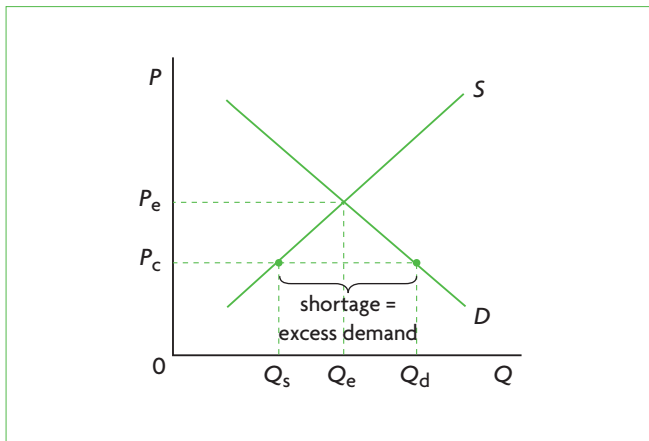
Figure 4.12   Price ceiling (maximum price) and market outcomes
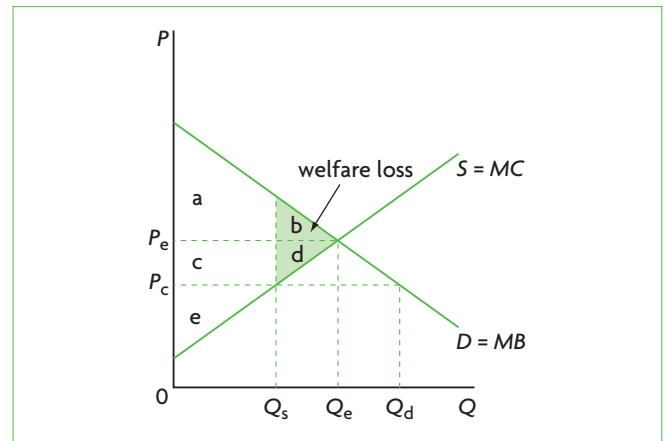
Figure 4.13   Welfare impacts of a price ceiling (maximum price)
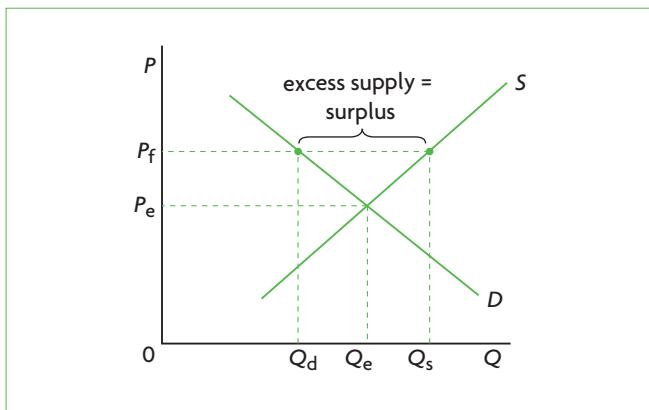
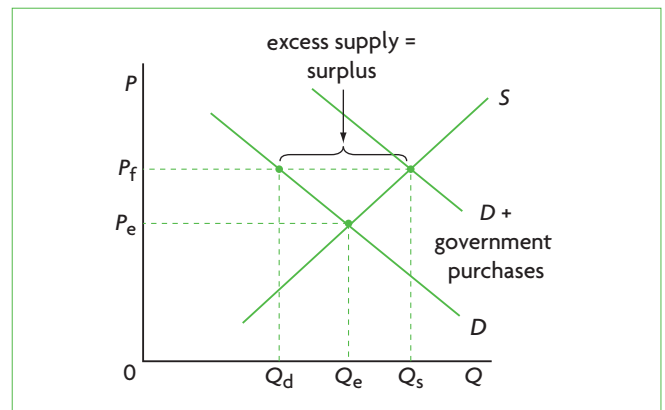Figure 4.15   Price floor (minimum price) and market outcomes

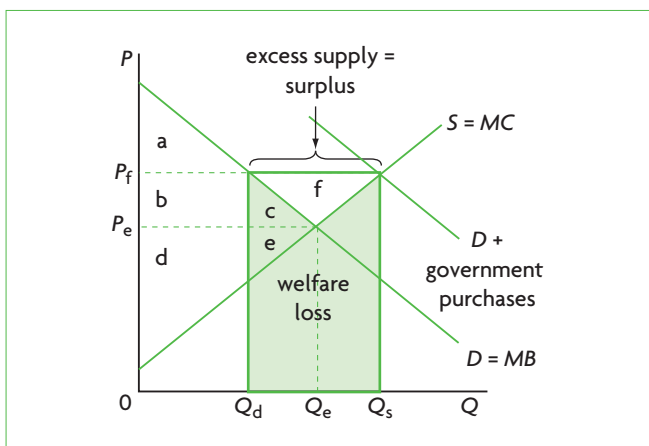Figure 4.16   An agricultural product market with price floor and government purchases of the surplus

Figure 4.17   Welfare impacts of a price floor (minimum price) for agricultural products and government purchases of the surplus
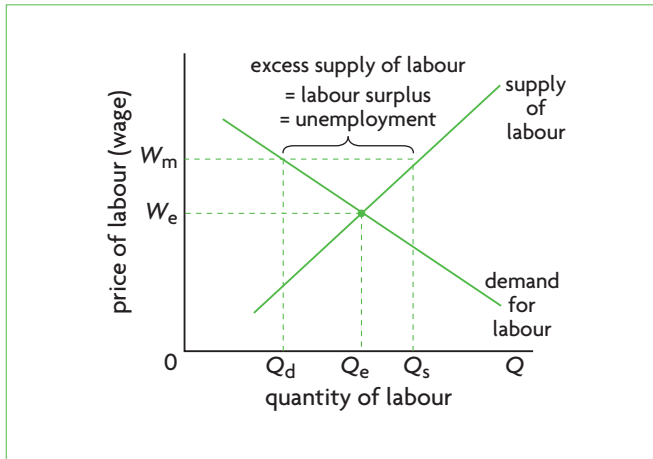
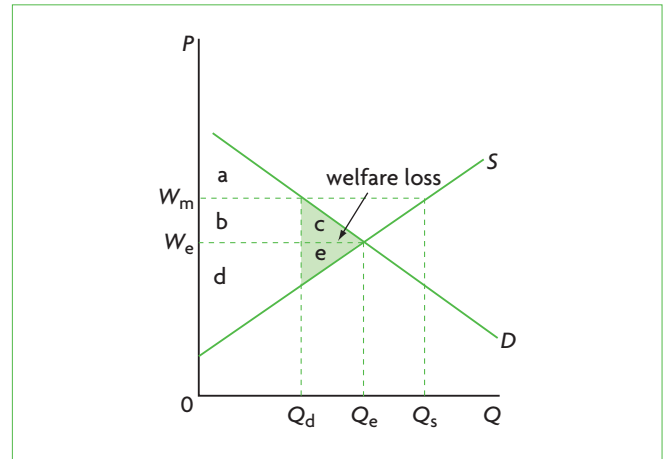**Figure 4.19** Labour market with minimum wage (price floor)

Figure 4.20 Welfare impacts of a minimum wage

Higher level topics
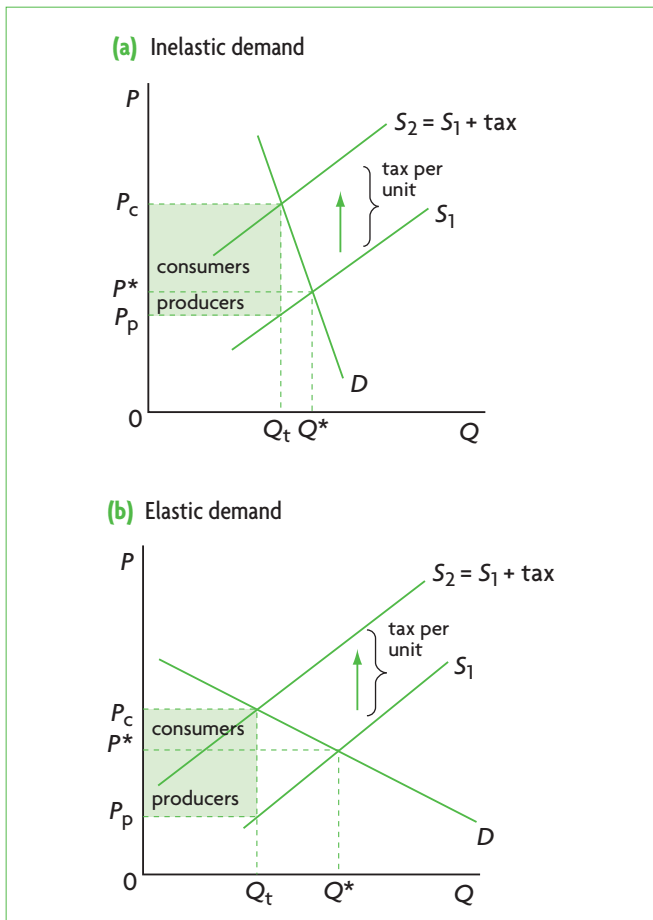
(a) Inelastic demand

(b) Elastic demand

Figure 4.6 Incidence of an indirect tax with inelastic and elastic demand
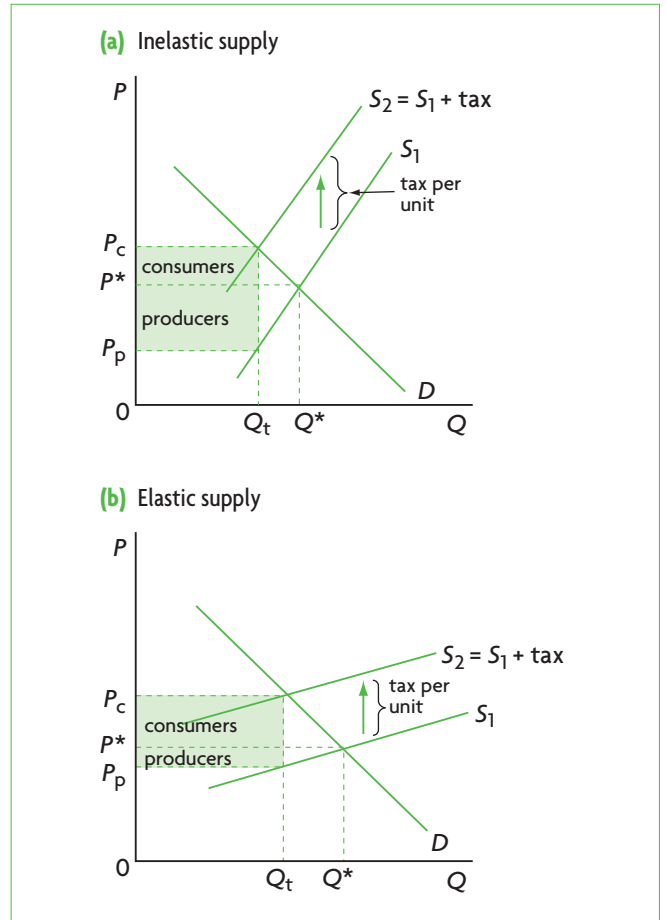
(a) Inelastic supply
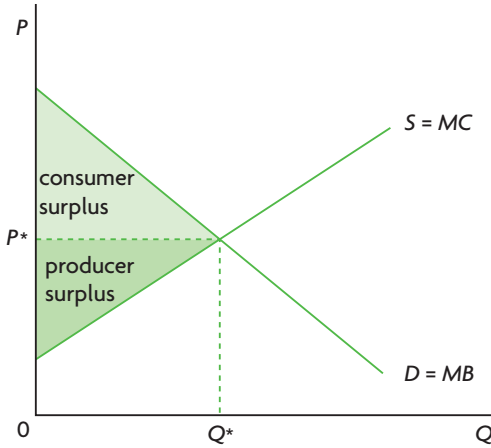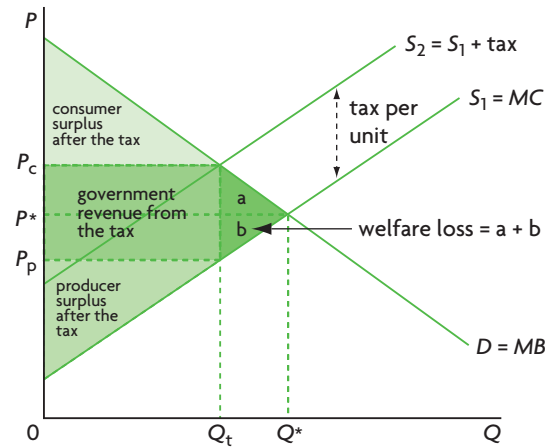
(b) Elastic supply

Figure 4.7 Incidence of an indirect tax with inelastic and elastic supply
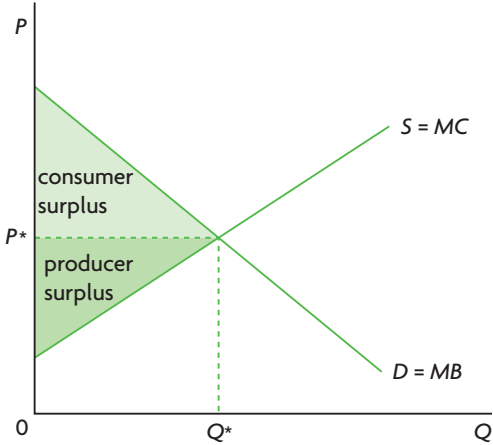
(a) Consumer and producer surplus in a competitive free market: maximum social surplus

(b) Consumer and producer surplus with an indirect (excise) tax: welfare loss

Figure 4.4 Effects of indirect taxes on consumer and producer surplus

(a) Consumer and producer surplus in a competitive free market: maximum social surplus

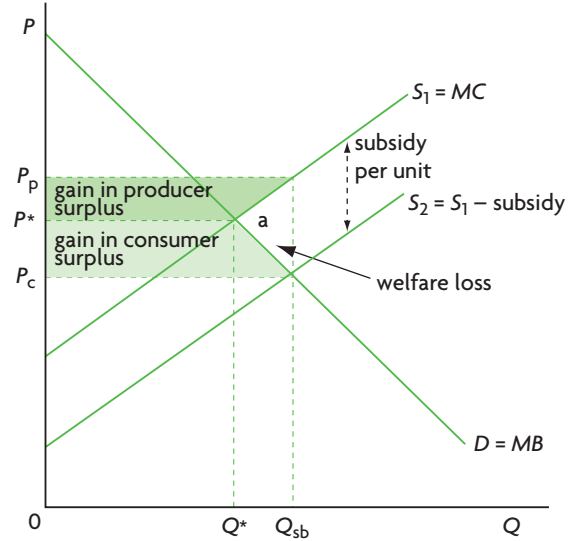**(b)** Consumer and producer surplus with a subsidy: welfare loss

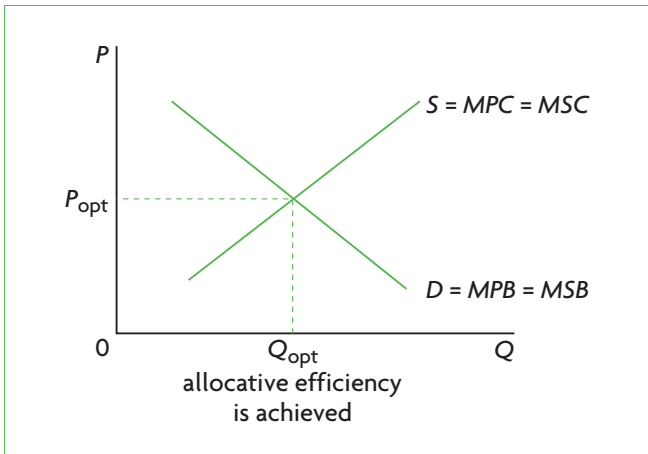**Figure 4.10** Effects of subsidies on consumer and producer surplus

Chapter 5 Market failure

Figure 5.1 Demand, supply and allocative efficiency with no externalities
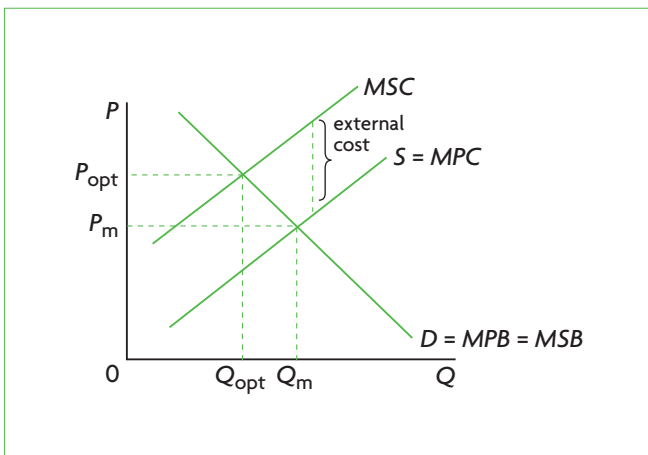

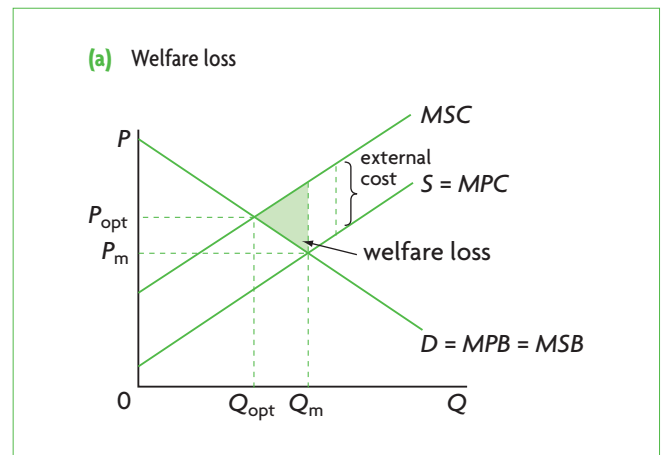**Figure 5.2** Negative production externality

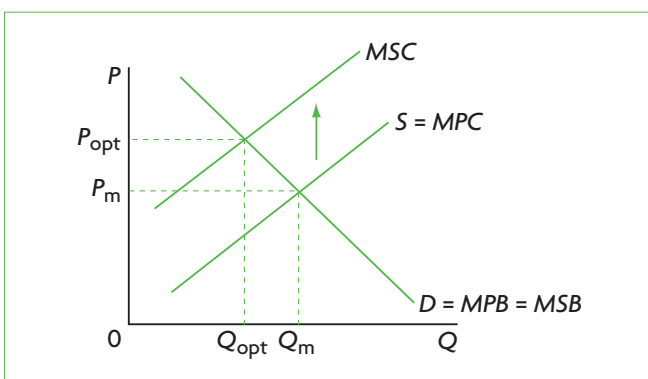**Figure 5.3** Welfare loss (deadweight loss) in a negative production externality

Figure 5.4 Government regulations to correct negative production externalities
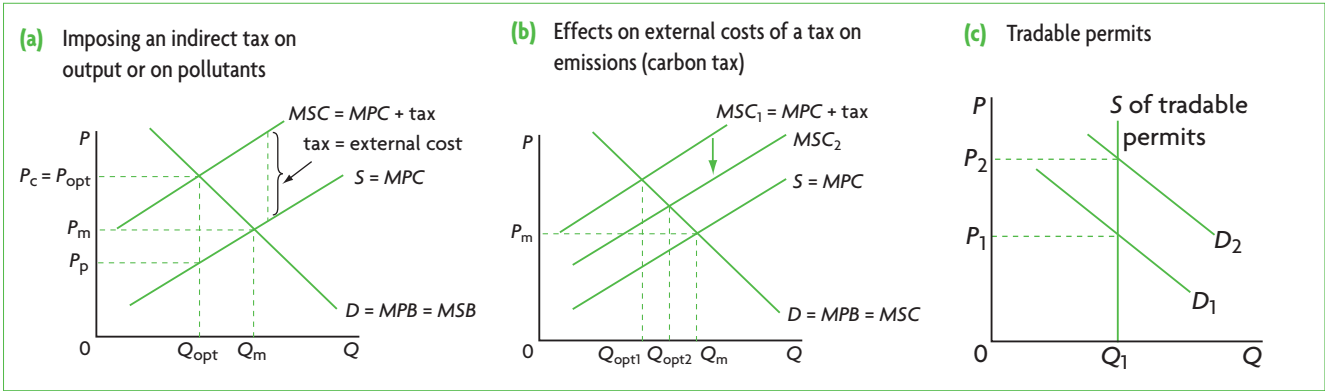
(a) Imposing an indirect tax on output or on pollutants

(b) Effects on external costs of a tax on emissions (carbon tax)

(c) Tradable permits

Figure 5.5 Market-based policies to correct negative production externalities
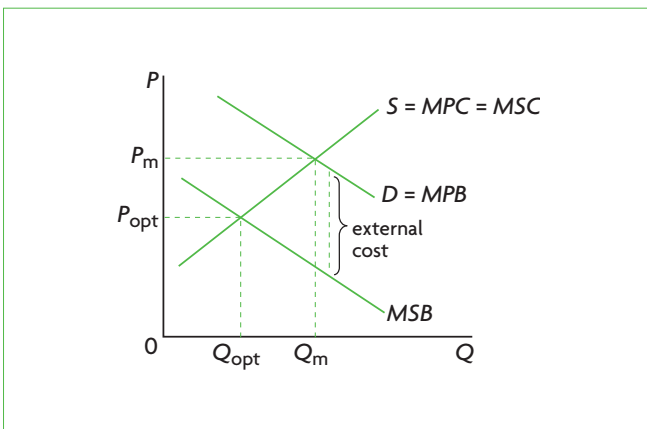
Figure 5.6 Negative consumption externality
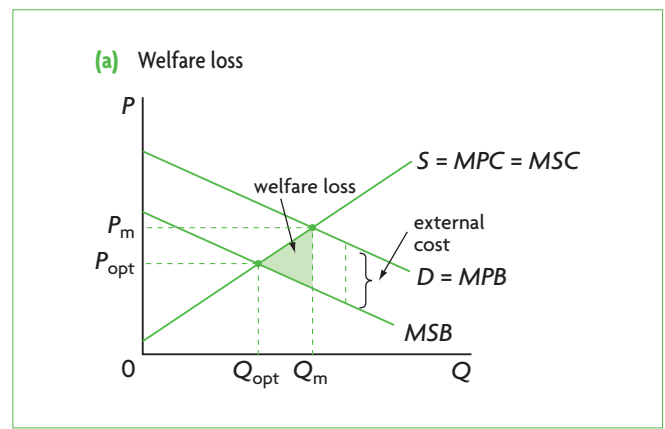
(a) Welfare loss

Figure 5.7 Welfare loss (deadweight loss) in a negative consumption externality

(a) Government regulations and advertising

(b) Market-based: imposing an indirect tax

Figure 5.8 Correcting negative consumption externalities
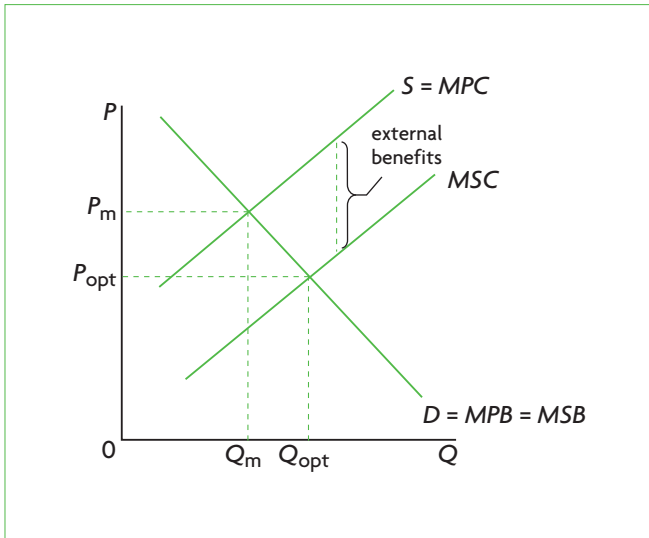
Figure 5.9 Positive production externality
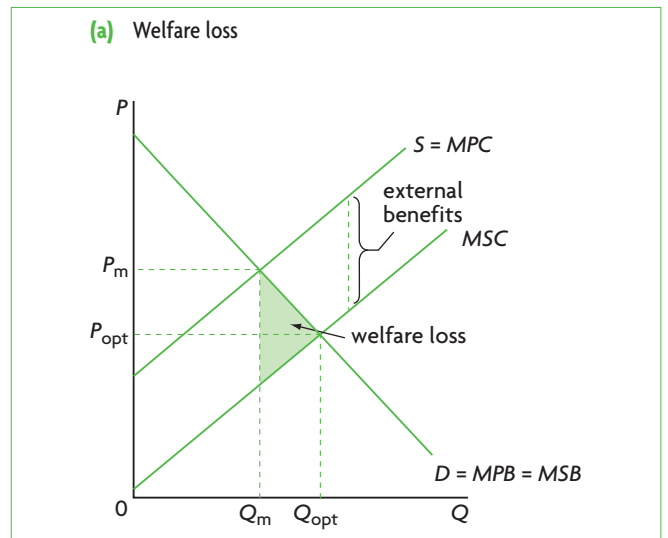
Figure 5.10 Welfare loss (deadweight loss) in a positive production externality

Figure 5.11 Correcting positive production externalities

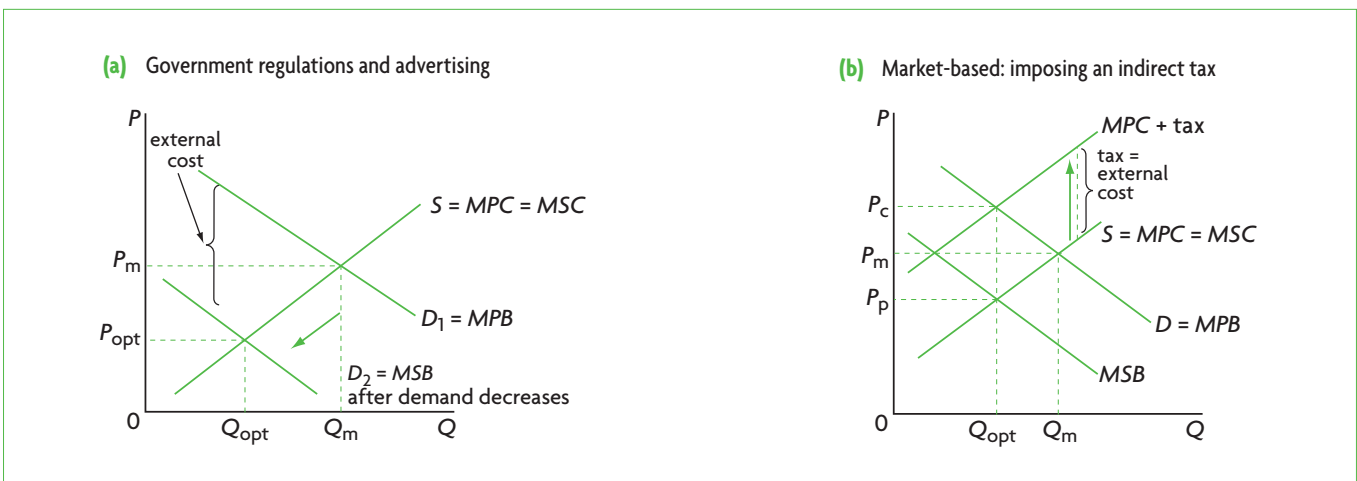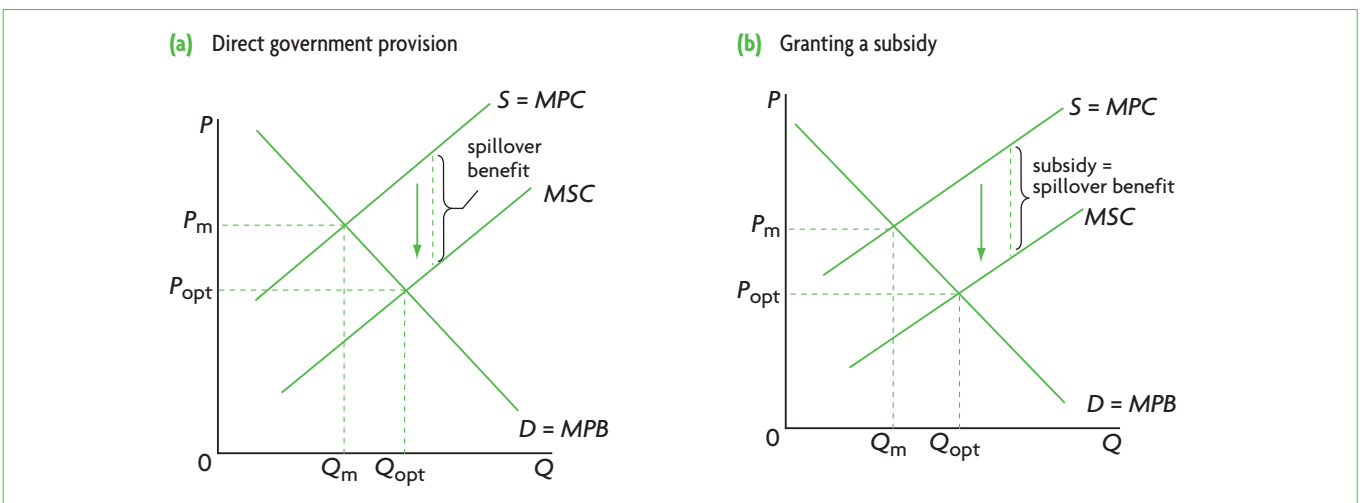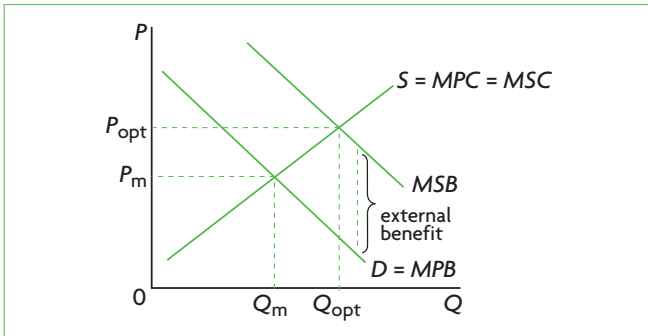**Figure 5.12** Positive consumption externality
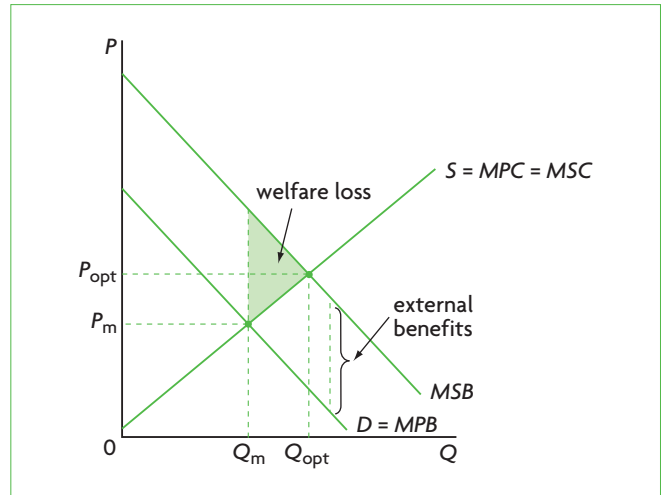
Figure 5.13 Welfare loss (deadweight loss) in a positive consumption externality

(a) Legislation or advertising

(b) Direct government provision

(c) Granting a subsidy
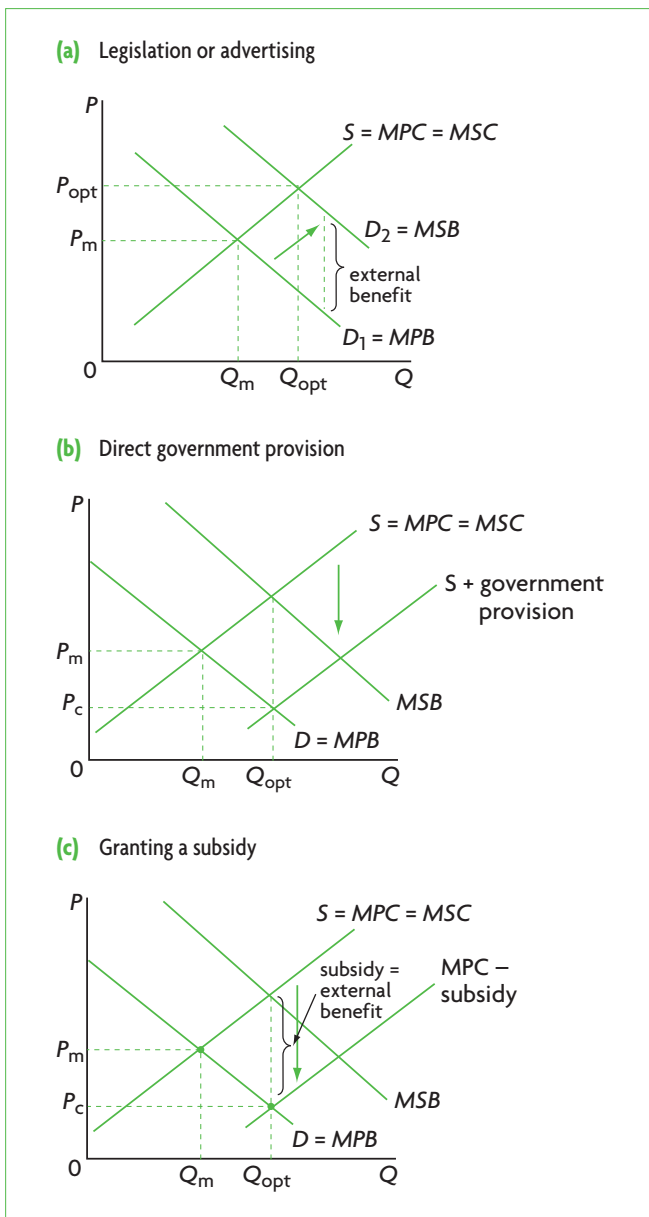
Figure 5.14 Correcting positive consumption externalities

Chapter 6 The theory of the firm I: Production, costs, revenues and profit

Higher level topics

(c) Total product curve

(d) Marginal and average product curves
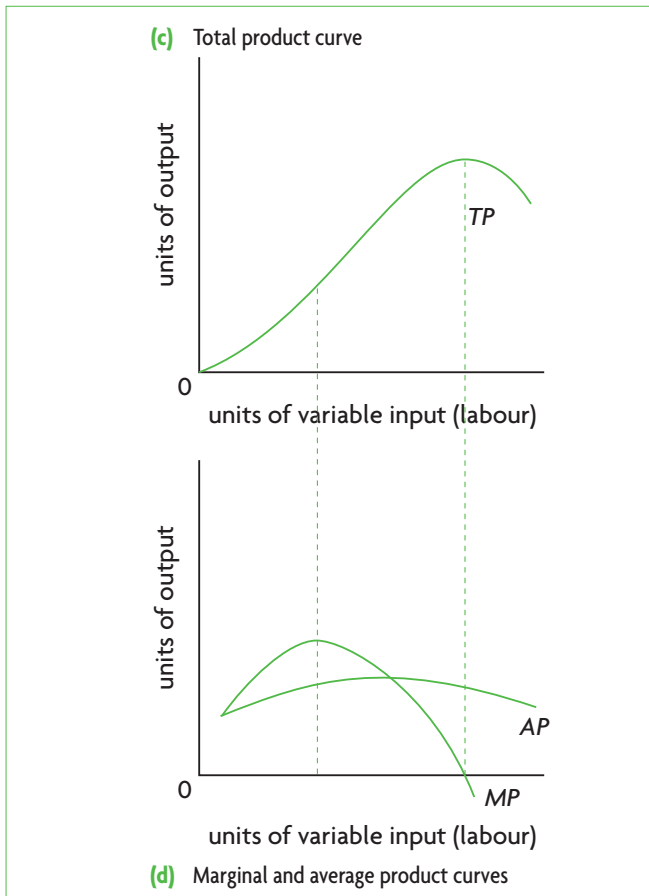
Figure 6.1 Total, marginal and average products

(c) Total cost, total variable cost and total fixed cost curves

(d) Average cost and marginal cost curves
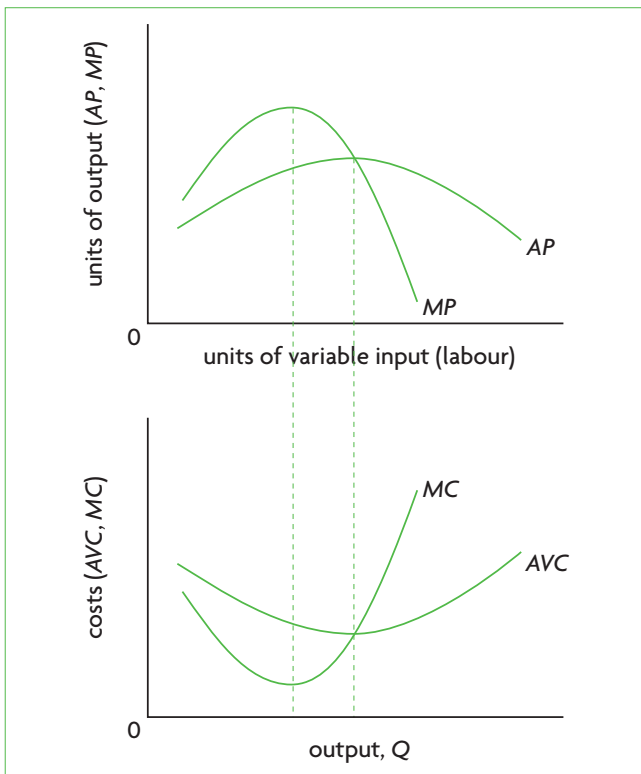
Figure 6.2 Total, average and marginal cost curves

Figure 6.3 Product curves and cost curves are mirror images due to the law of diminishing returns

(b) Long-run average total cost curve in relation to
short-run average total cost curves
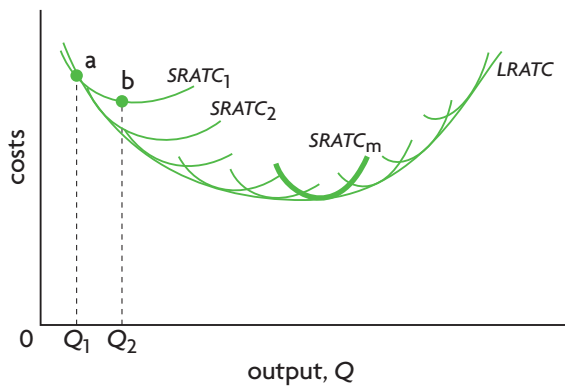
(c) Economies and diseconomies of scale
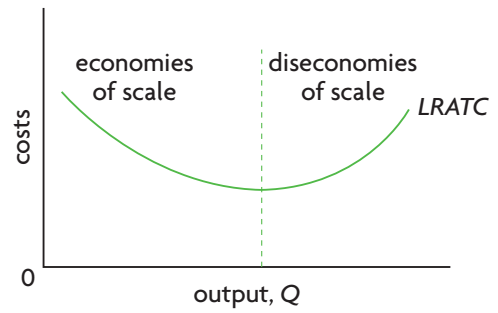
Figure 6.5 The long-run average total cost curve

(a) Profit-maximising firm produces at Q_2 and
makes economic profit: $TR - TC = c - d$
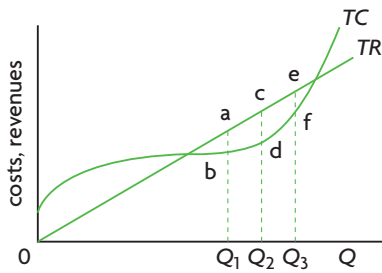
(b) Profit-maximising firm produces at Q_2 and
makes zero economic profit: $TR - TC = 0$
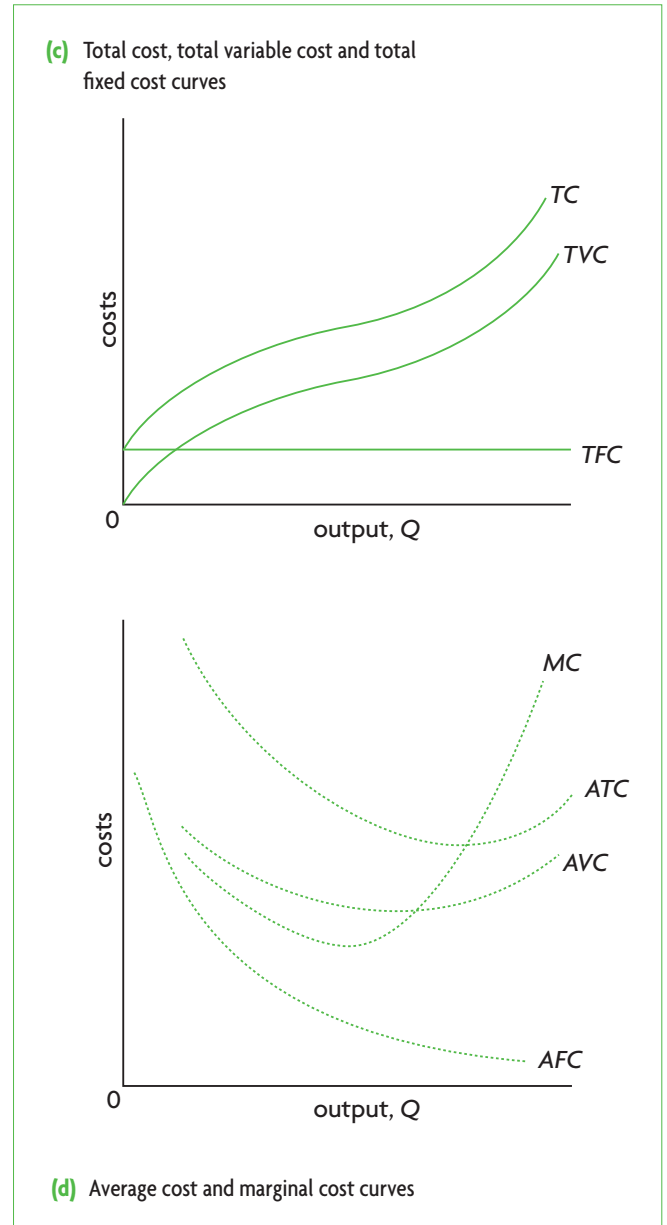(it earns normal profit)
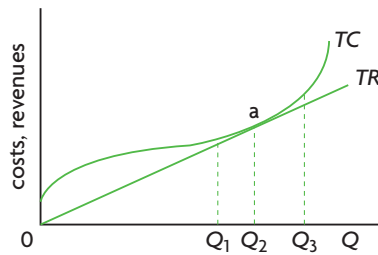
(c) The loss-minimising firm produces at Q_2
(if it produces) and makes a loss $= TC - TR$
$= a - b$ (negative economic profit since
$TR < TC$)
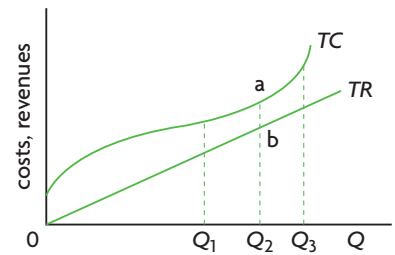
Figure 6.10 Profit maximisation using the total revenue and total cost approach when the firm has no control over price

(a) Profit maximisation
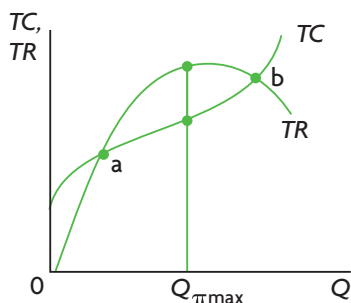
(b) Loss minimisation
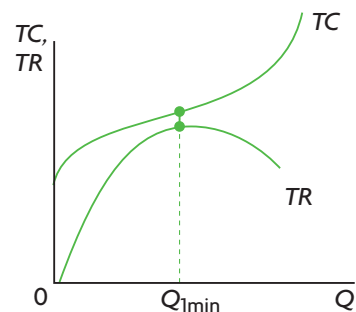
Figure 6.11 Profit maximisation using the total revenue and total cost approach when the firm has control over price

Chapter 7 The theory of the firm II: Market structures

Higher level topic

(a) Individual firm   **(b)** Market/industry
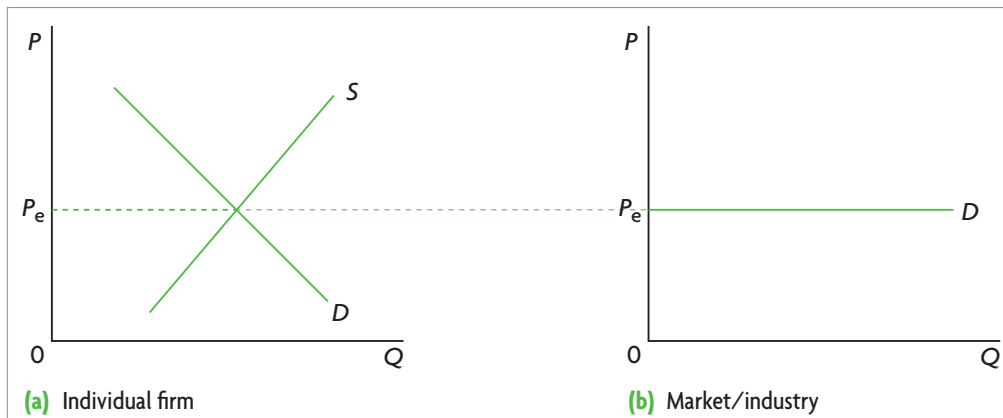
Figure 7.1   Market (industry) demand and supply determine demand faced by the perfectly competitive firm

(a) Total revenue   **(b)** Marginal and average revenue
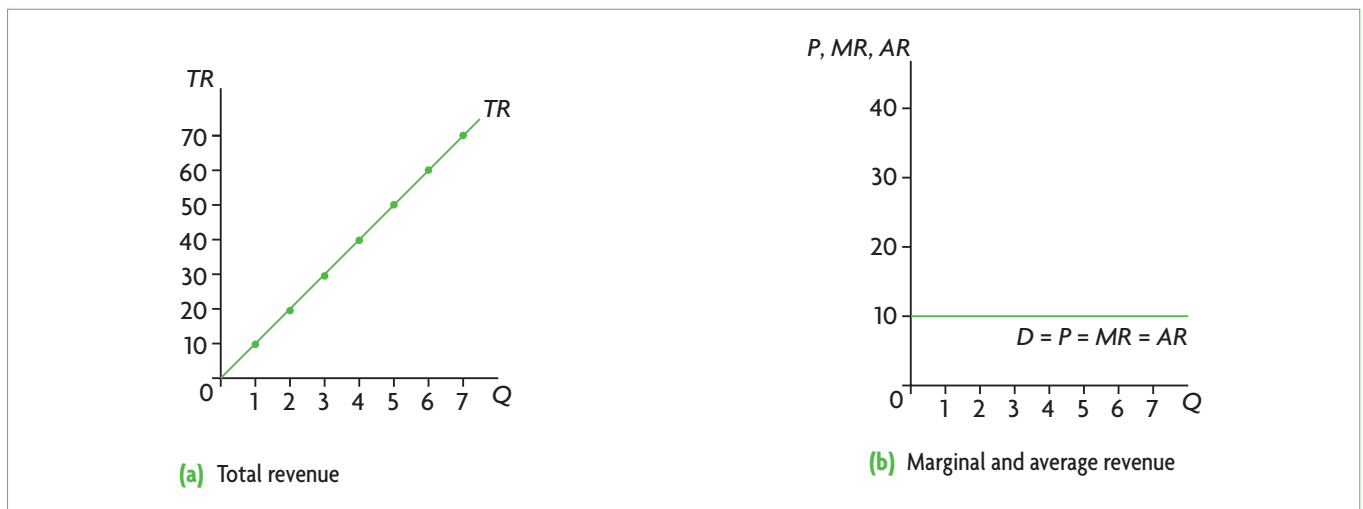
Figure 7.2   Revenue curves under perfect competition

$P > ATC$
firm makes economic
(supernormal) profit

P = minimum ATC = break-even price
firm makes normal profit,
or zero economic profit

$ATC > P > AVC$
firm makes loss but
continues to produce

P = minimum AVC = shut-down price
firm is indifferent between producing
at a loss or not producing

$P < AVC$
firm makes loss
and shuts down
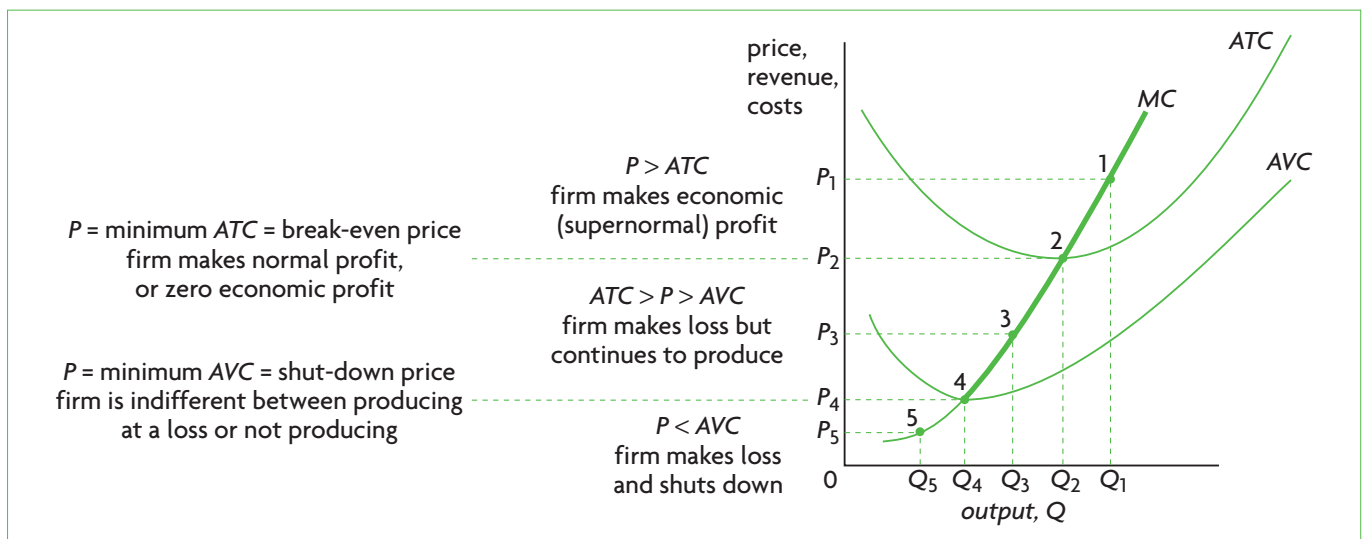
Figure 7.4   Summary of the perfectly competitive firm's short-run decisions, and the firm's short-run supply curve

(a) Economic profit

(b) Zero economic profit (normal profit)

(c) Economic loss: the firm continues to produce

(d) Loss in the short run and the shut-down price

(e) The loss-making firm that will not produce
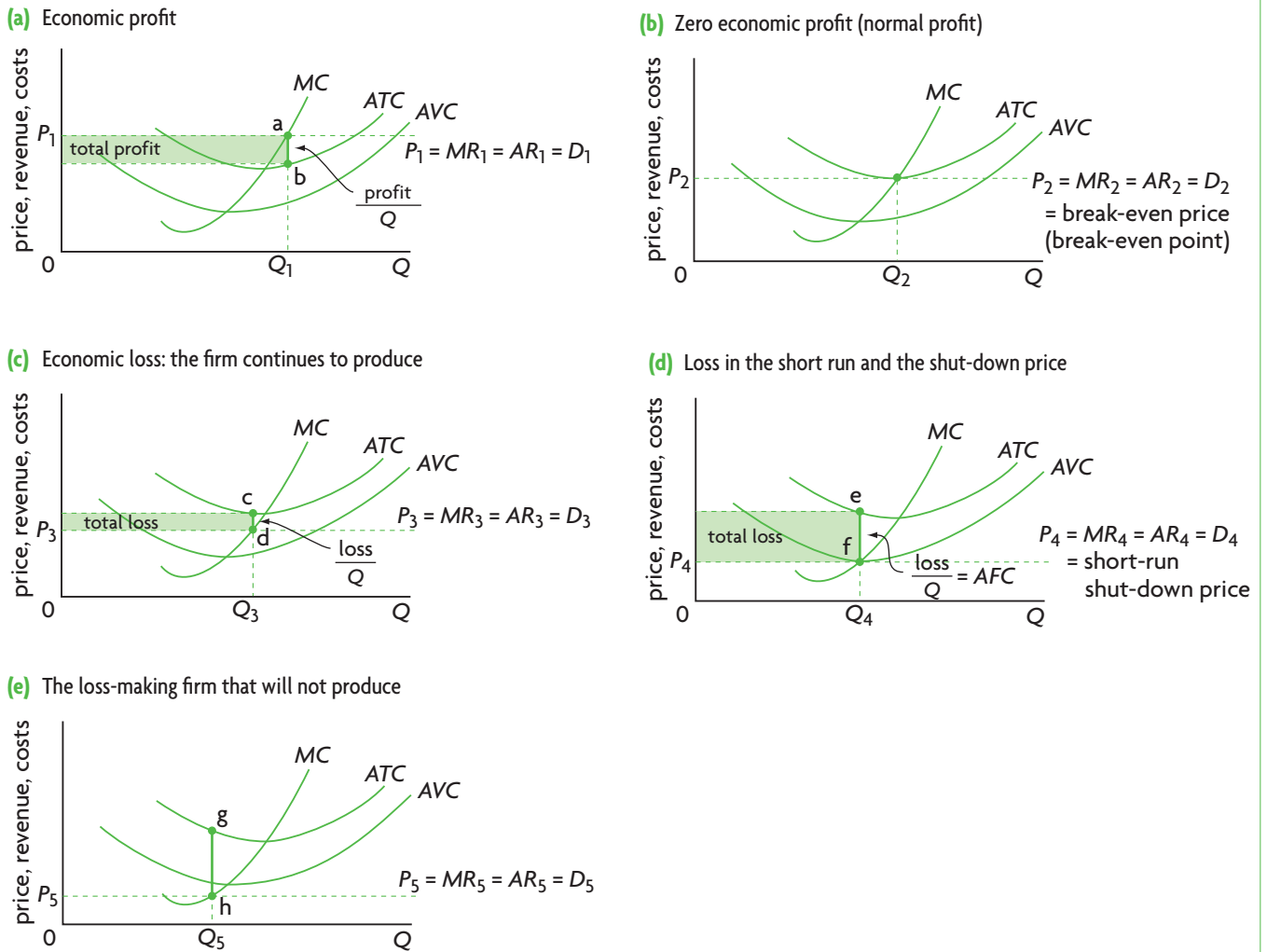
Figure 7.3 Short-run equilibrium positions of the perfectly competitive firm

(a) The firm
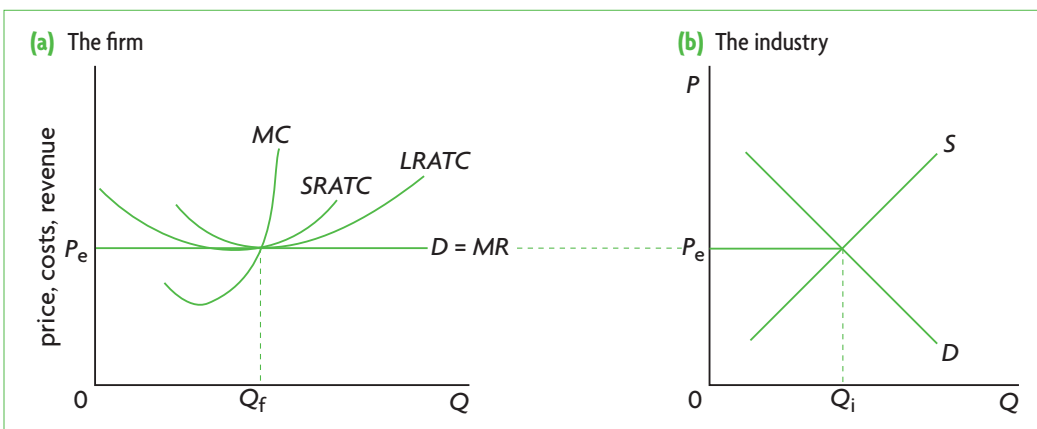
(b) The industry

Figure 7.5 The firm and industry long-run equilibrium position in perfect competition

In diagram (a): $P_1 = MR_1 = AR_1 = D_1$, total profit, points a and b, $\frac{profit}{Q}$, Q_1.

In diagram (b): $P_2 = MR_2 = AR_2 = D_2$ = break-even price (break-even point), Q_2.

In diagram (c): $P_3 = MR_3 = AR_3 = D_3$, total loss, points c and d, $\frac{loss}{Q}$, Q_3.

In diagram (d): $P_4 = MR_4 = AR_4 = D_4$ = short-run shut-down price, total loss, points e and f, $\frac{loss}{Q} = AFC$, Q_4.

In diagram (e): $P_5 = MR_5 = AR_5 = D_5$, points g and h, Q_5.

In Figure 7.5 (a) The firm: MC, SRATC, LRATC, P_e, $D = MR$, Q_f.

In Figure 7.5 (b) The industry: P, S, D, P_e, Q_i.

HL

HL

From economic (supernormal) profit to normal profit

(a) The firm
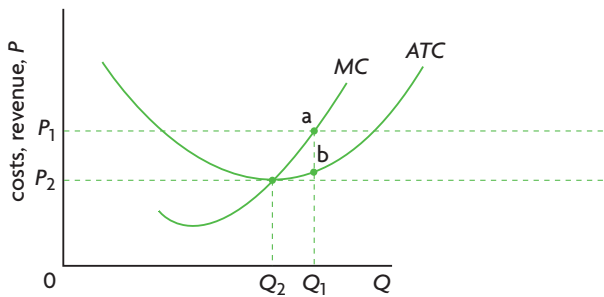
(b) The industry
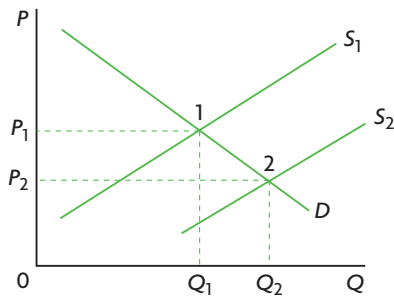
From loss to normal profit

(c) The firm
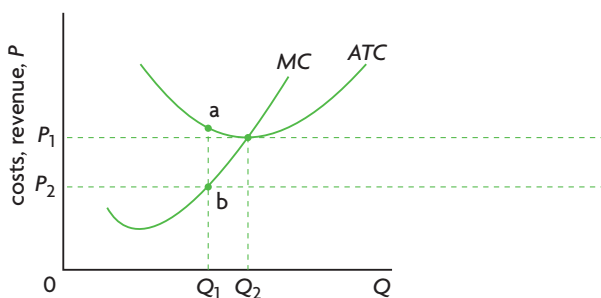
(d) The industry
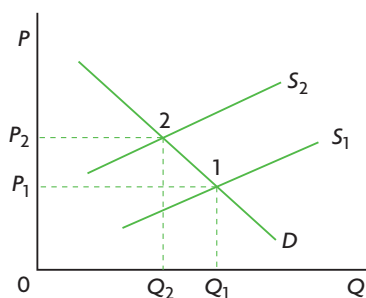
Figure 7.6 From short-run equilibrium to long-run equilibrium

(a) The firm

(b) The market/industry
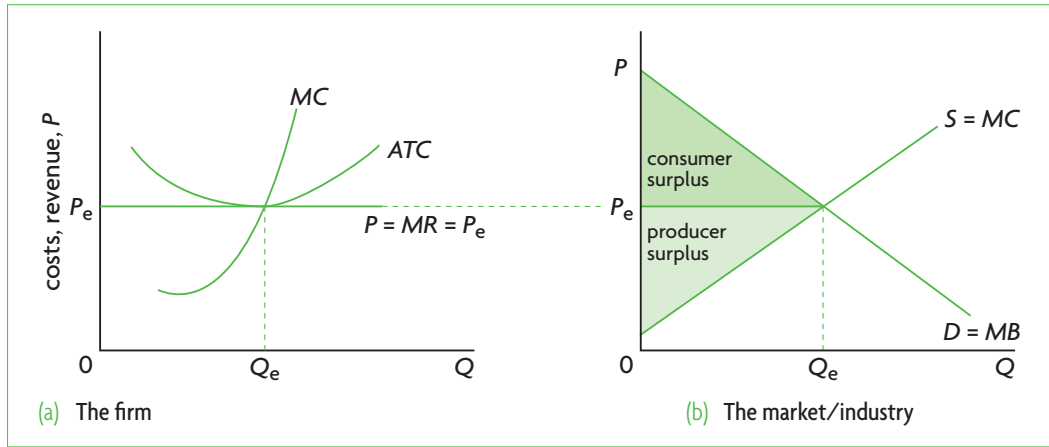
Figure 7.7 Productive and allocative efficiency in perfect competition in the long run
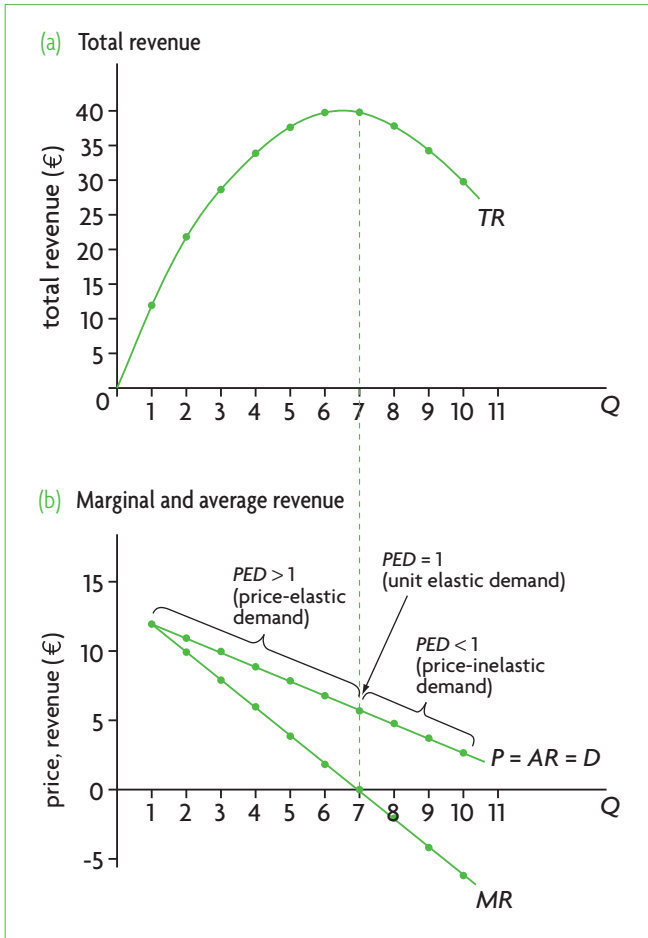
Figure 7.10 Revenue curves in monopoly

Figure 7.11 Profit maximisation and loss minimisation in monopoly: marginal revenue and cost approach

Figure 7.12 Comparison of profit maximisation and revenue maximisation by the monopolist
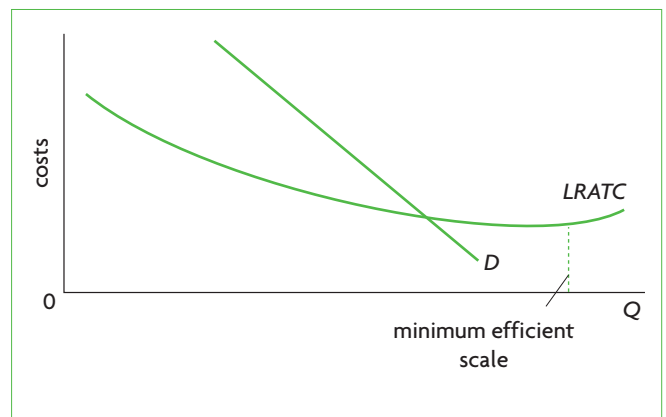
Figure 7.13 Natural monopoly

HL

(a) Industry in perfect competition
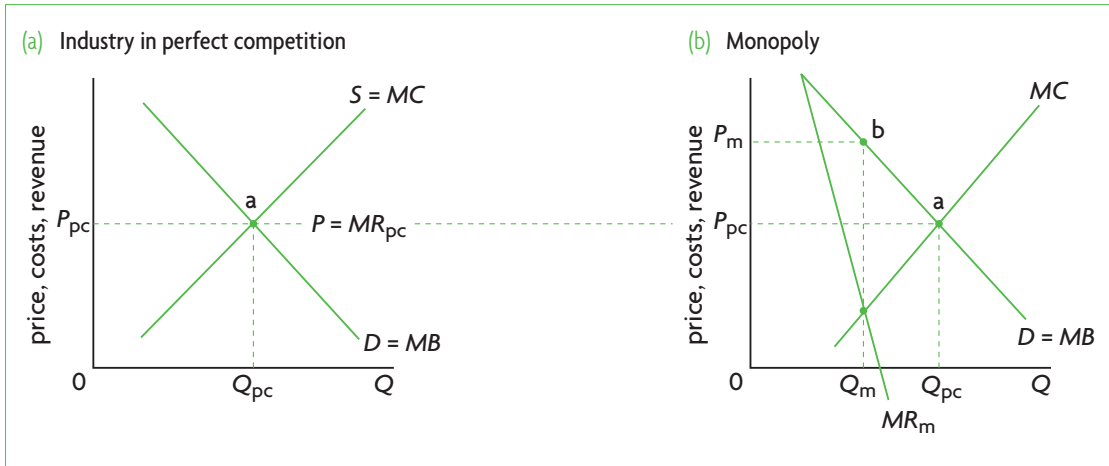
(b) Monopoly

Figure 7.14 Higher price, lower output by the firm in monopoly

(a) Perfect competition
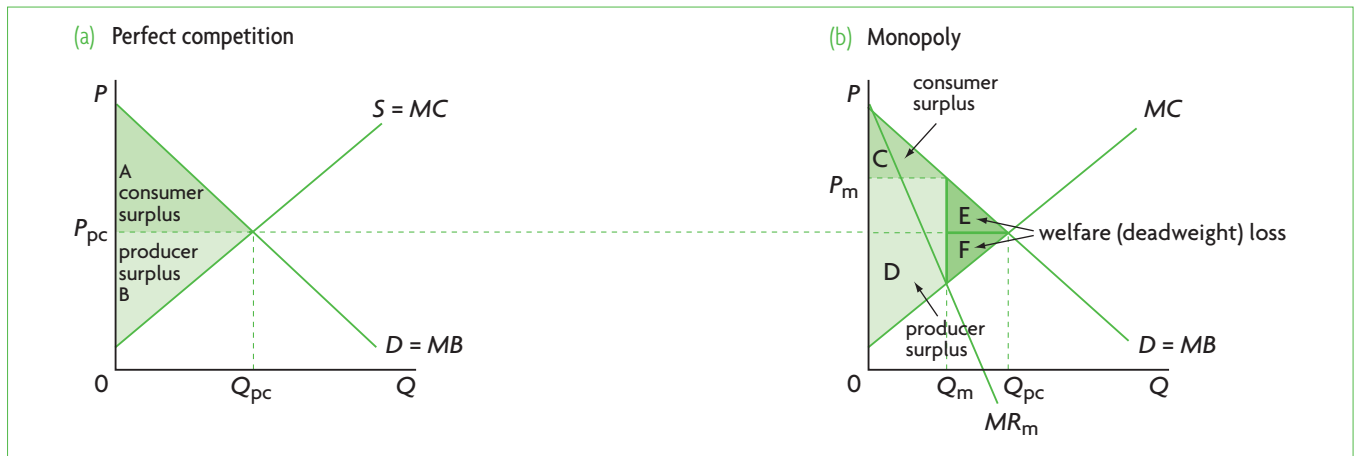
(b) Monopoly

Figure 7.15 Consumer and producer surplus and welfare (deadweight) loss in monopoly compared with perfect competition

(a) Perfectly competitive firm

(b) Monopoly

at long-run equilibrium
production takes place at min ATC
(productive efficiency), and
$P_e = MC$ (allocative efficiency)

at long-run equilibrium
production takes place at greater than
min ATC (productive inefficiency), and
$P_e > MC$ (allocative inefficiency)
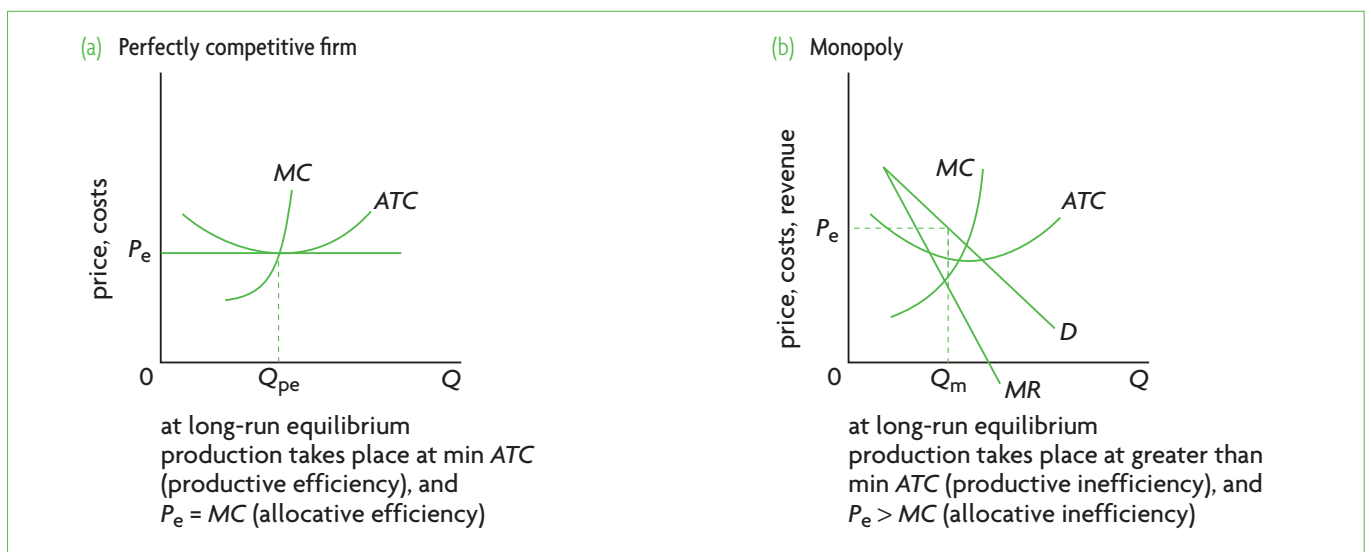
Figure 7.16 Allocative and productive inefficiency in perfect competition and monopoly

HL

HL

(a) Economic profit

economic
(supernormal)
profit

MC

*P*e

ATC

D = AR

0   *Q*e   *Q*

MR

(b) Normal profit

MC   *ATC*

*P*e

D = AR

0   *Q*e   *Q*

MR

(c) Losses

losses   *MC*   *ATC*

*P*e

D = AR

0   *Q*e   *MR*   *Q*
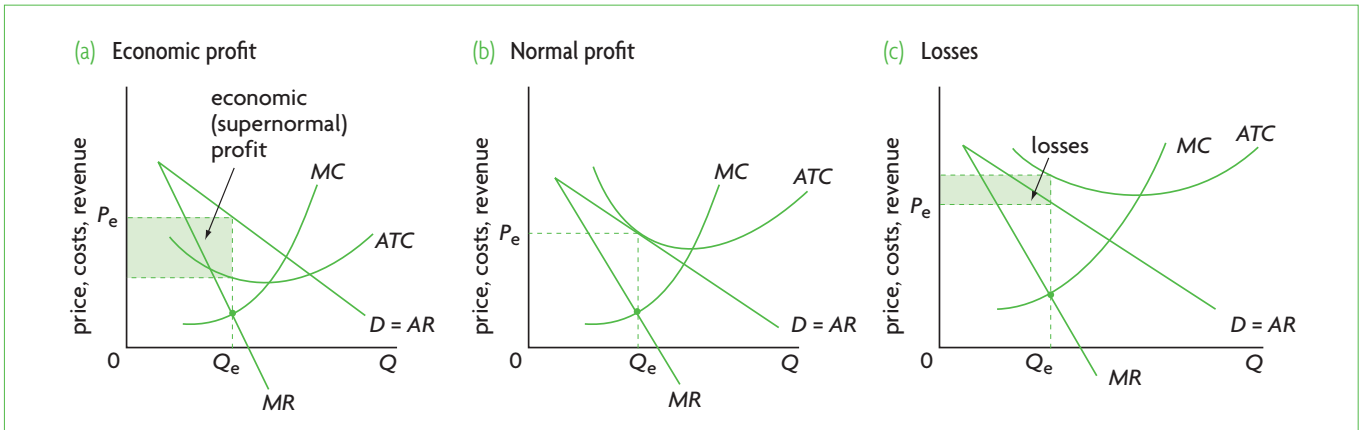
Figure 7.21   Short-run equilibrium positions of the firm in monopolistic competition

MC

ATC

*P*e

D = AR

0   *Q*e   *Q*c   *Q*

MR
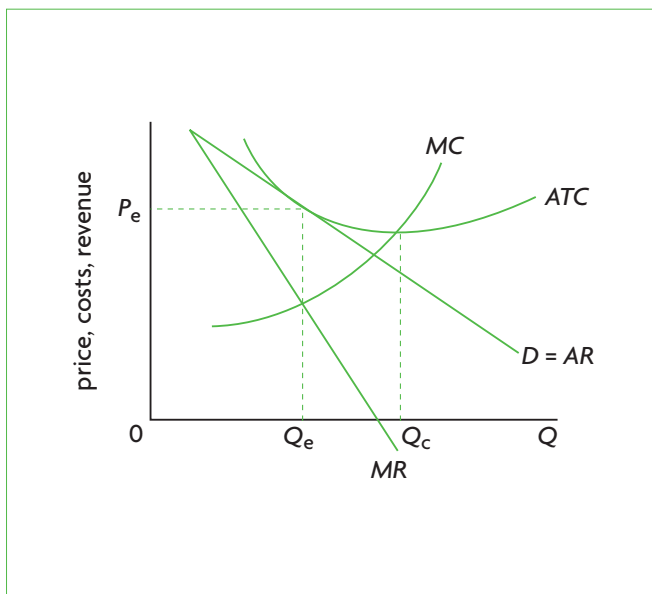
Figure 7.22   Long-run equilibrium of the firm in monopolistic
competition

Intergalactic Space Travel's price

High price   Low price

	High price	Low price
High price	40 million Zs / 40 million Zs **4**	70 million Zs / 10 million Zs **2**
Low price	10 million Zs / 70 million Zs **3**	20 million Zs / 20 million Zs **1**

Universal Space Line's price
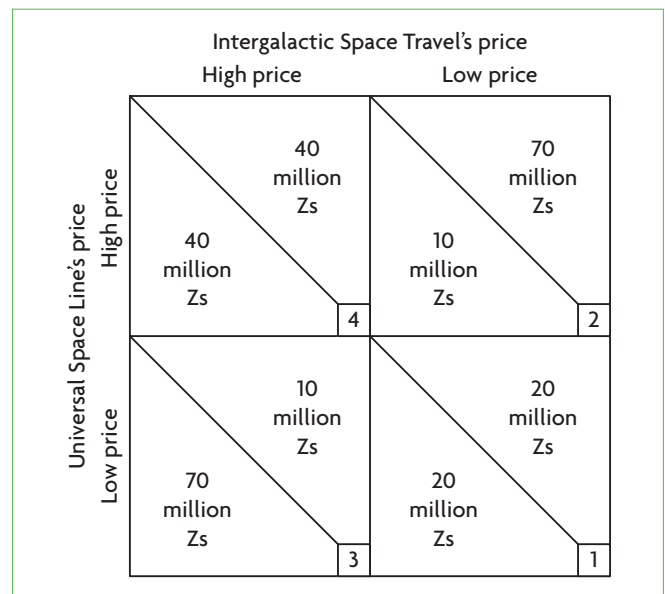
Figure 7.23   Game theory: the prisoner's dilemma

MC

ATC

*P*e

profit

a

b

D = AR

0   *Q*π max   *MR*   *Q*
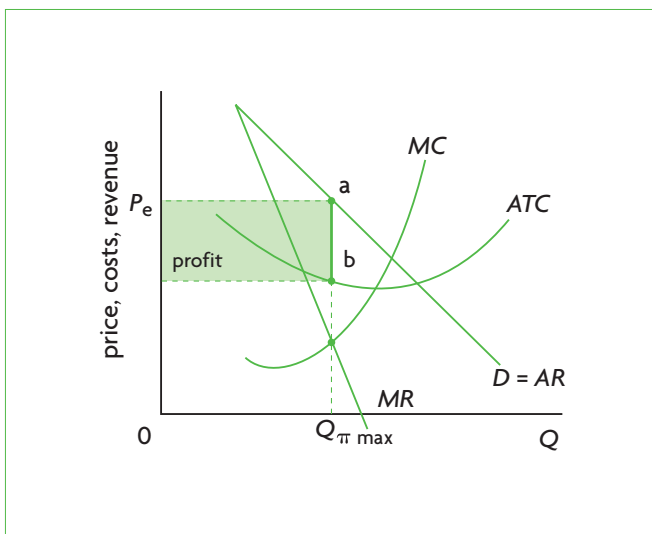
Figure 7.24   Profit maximisation by a price-fixing cartel

P

*P*1   Z   *MC*1

*MC*2

D

0   *Q*1   *Q*

MR
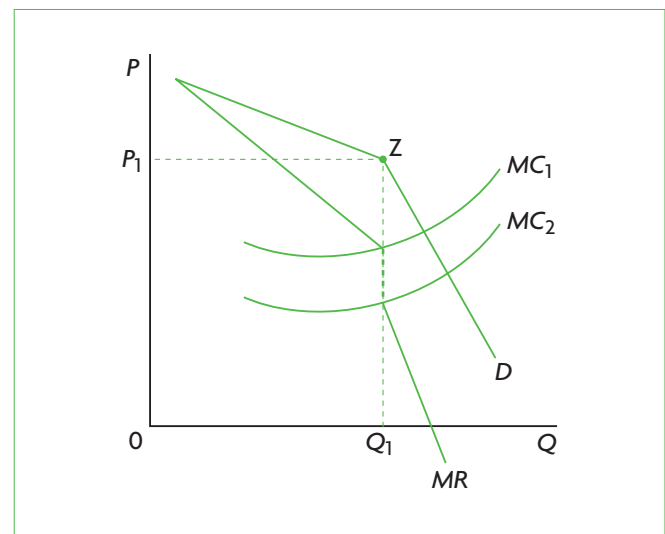
Figure 7.25   The kinked demand curve

HL

HL

(a) Market 1   (b) Market 2   (c) Market 1 and market 2

Figure 7.26 Third-degree price discrimination

Chapter 8 The level of overall economic activity
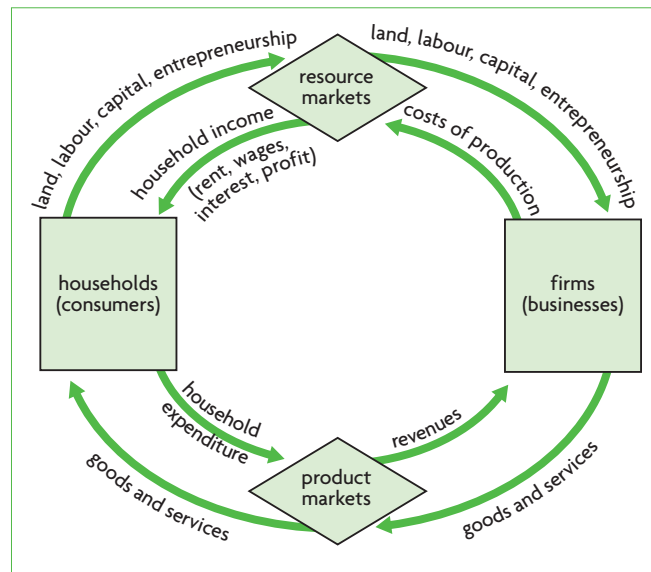
Figure 8.1   Circular flow of income model in a closed economy with no government

Figure 8.3   Circular flow of income model with leakages and injections
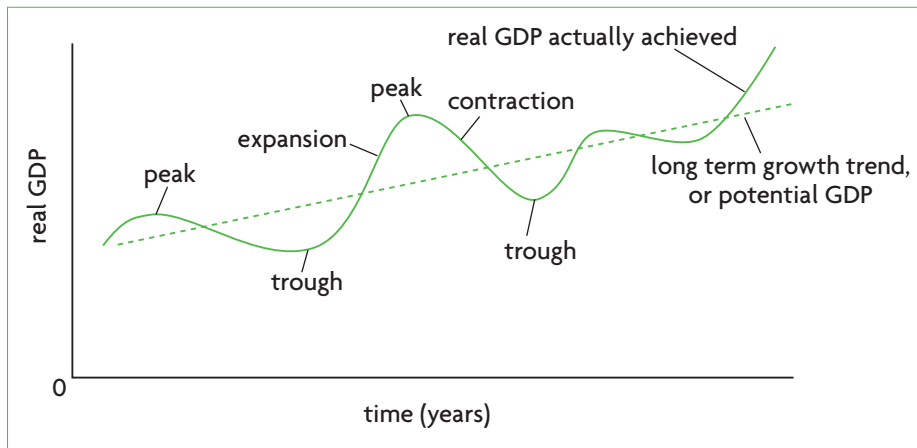
Figure 8.4   The business cycle
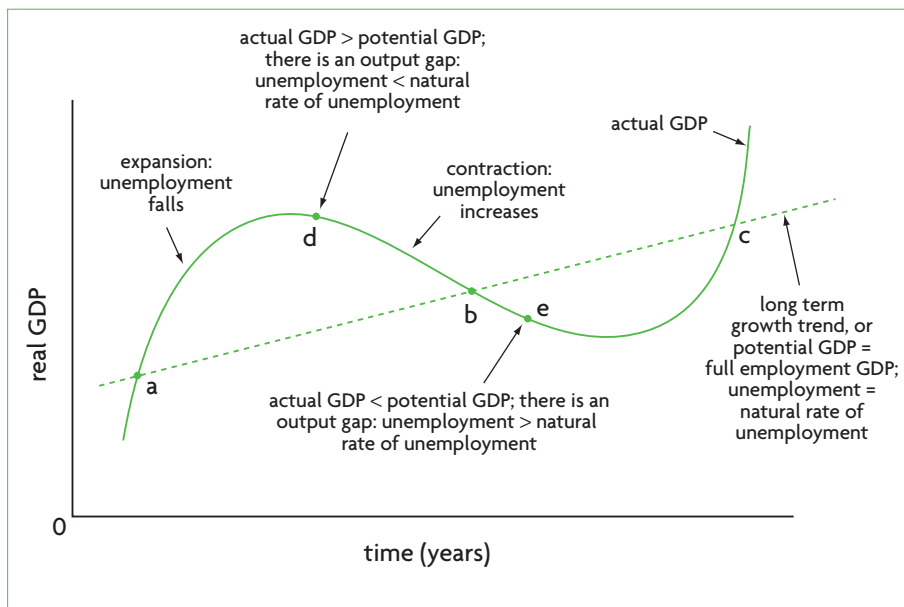
Figure 8.5   Illustrating actual output, potential output and unemployment in the business cycle

Chapter 9 Aggregate demand and aggregate supply

(a) The aggregate demand curve

price level / real GDP — AD

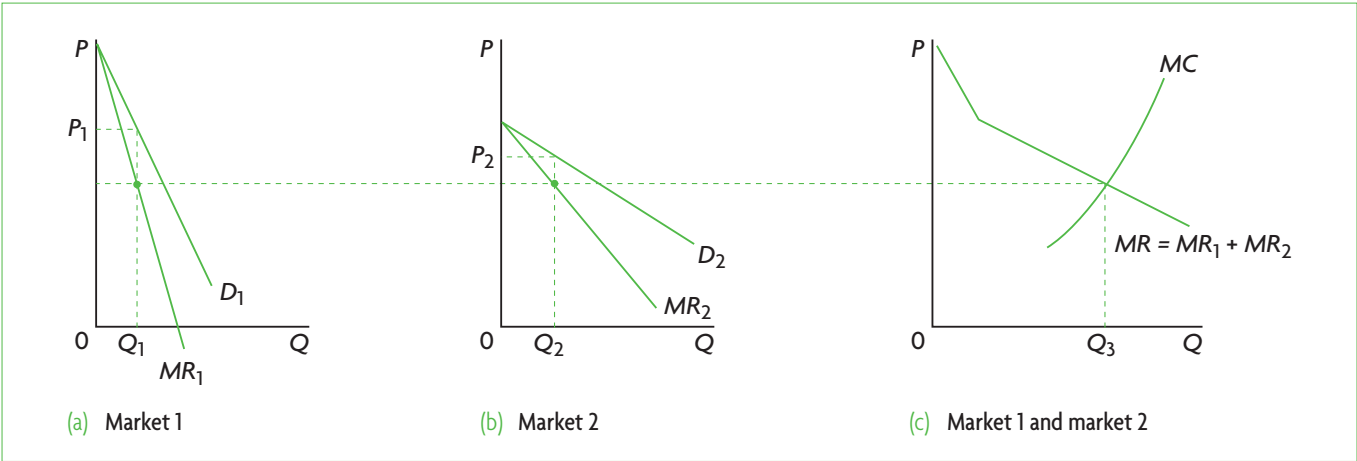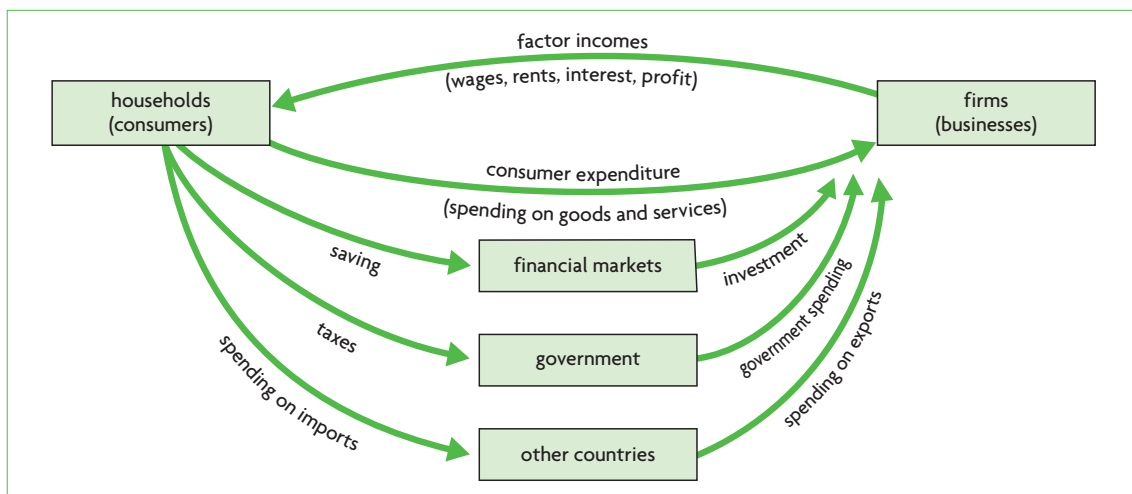**(b)** Shifts in the aggregate demand curve

price level / real GDP — AD_3 AD_1 AD_2
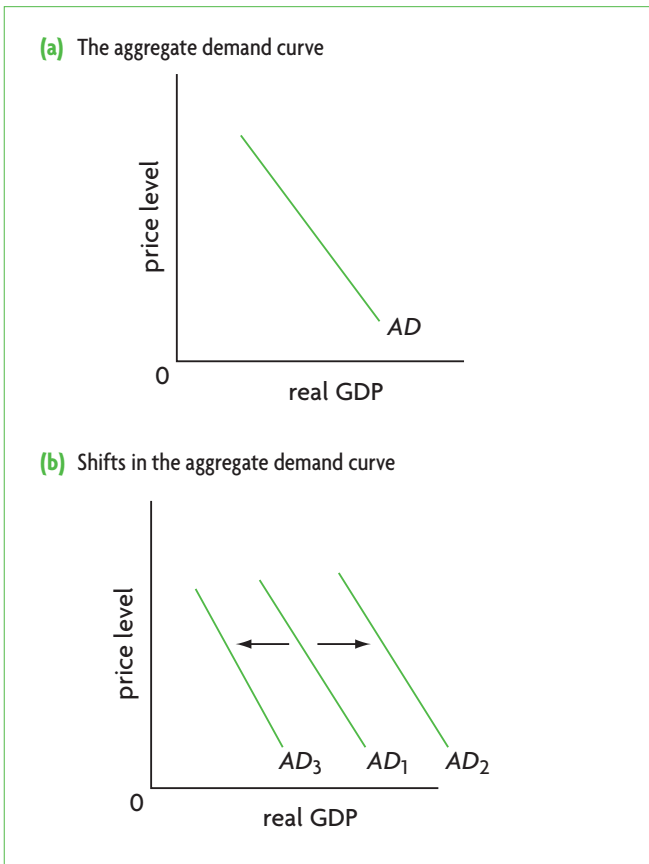
Figure 9.1 The aggregate demand (AD) curve

(a) The upward-sloping *SRAS* curve

price level / real GDP — SRAS

(b) Shifts in the *SRAS* curve

price level / real GDP — $SRAS_3$ $SRAS_1$ $SRAS_2$
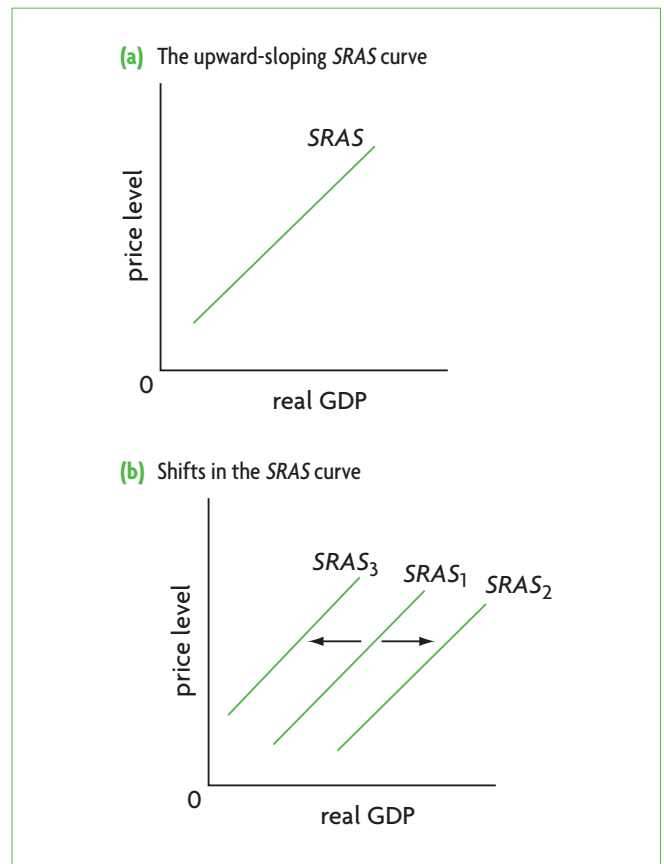
Figure 9.2 The short-run aggregate supply curve (*SRAS*)

(a) The economy with a deflationary (recessionary) gap

price level / real GDP — SRAS, AD, Pl_e, Y_e Y_p

(b) The economy with an inflationary gap

price level / real GDP — SRAS, AD, Pl_e, Y_p Y_e

(c) The economy at the full employment level of output

price level / real GDP — SRAS, AD, Pl_e, $Y_p = Y_e$
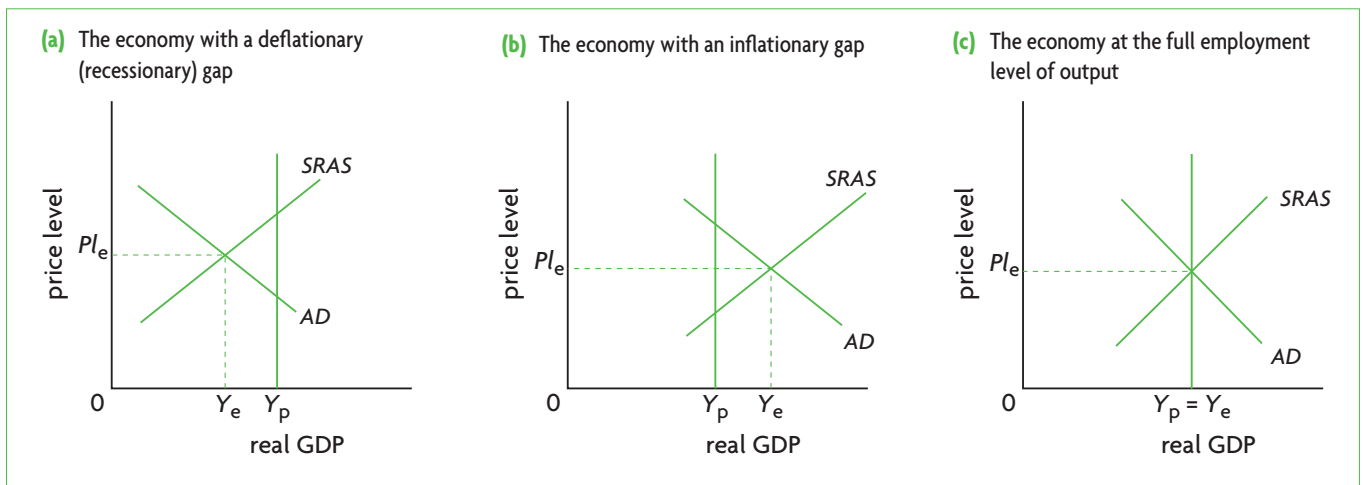
Figure 9.4 Three short-run equilibrium states of the economy

(a) Changes in aggregate demand

(b) Changes in short-run aggregate supply
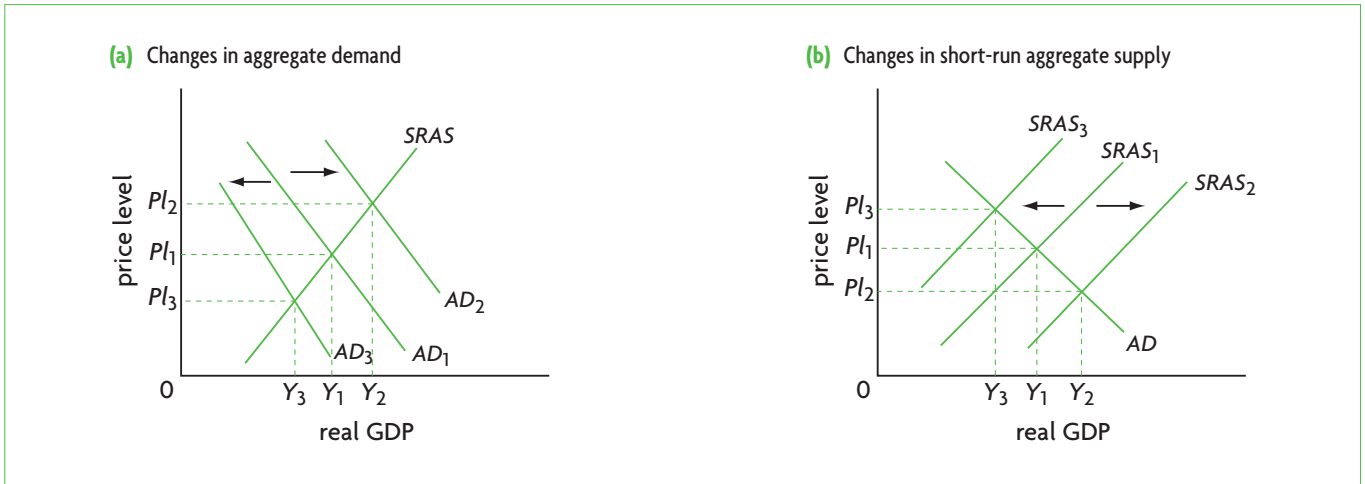
Figure 9.5 Impacts of changes in short-run macroeconomic equilibrium

(a) Changes in aggregate demand

(b) Changes in short-run aggregate supply
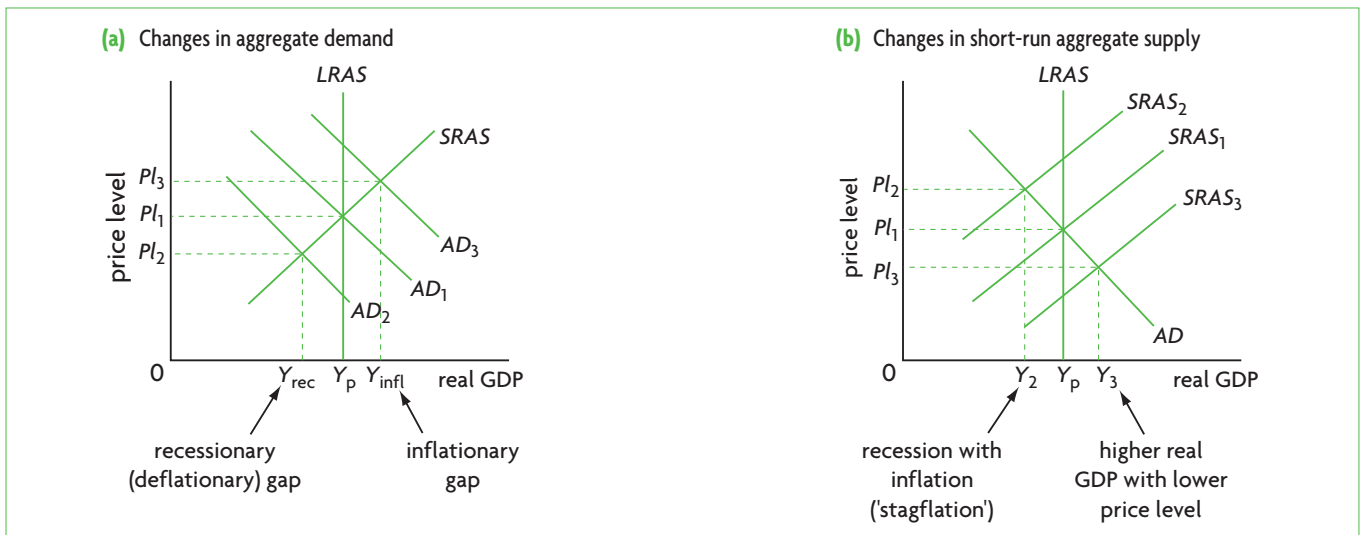
Figure 9.6 Possible causes of the business cycle
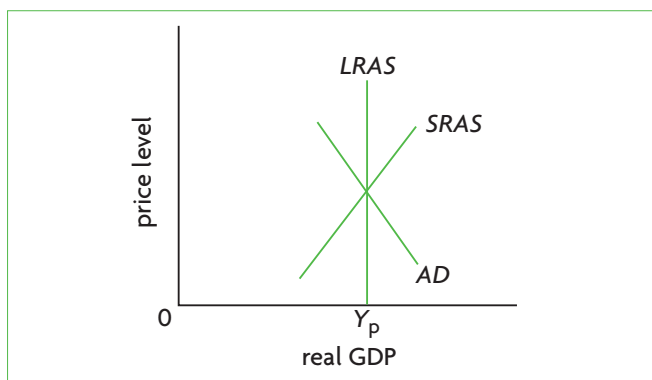
Figure 9.7 The *LRAS* curve and long-run equilibrium in the monetarist/ new classical model

(a) Creating and eliminating a deflationary gap

(b) Creating and eliminating an inflationary gap
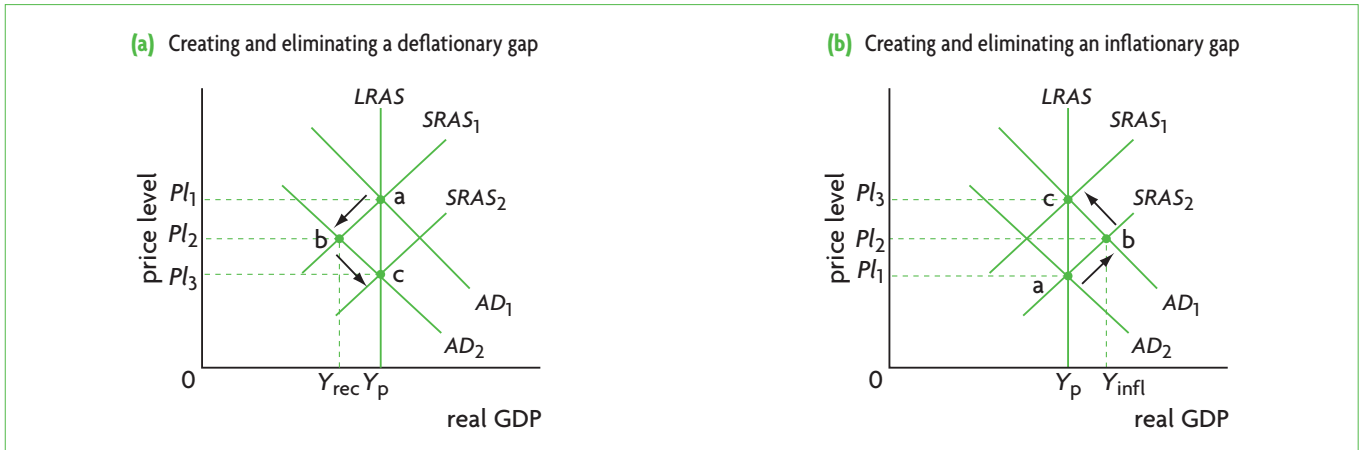
Figure 9.8 Returning to long-run full employment equilibrium in the monetarist/new classical model
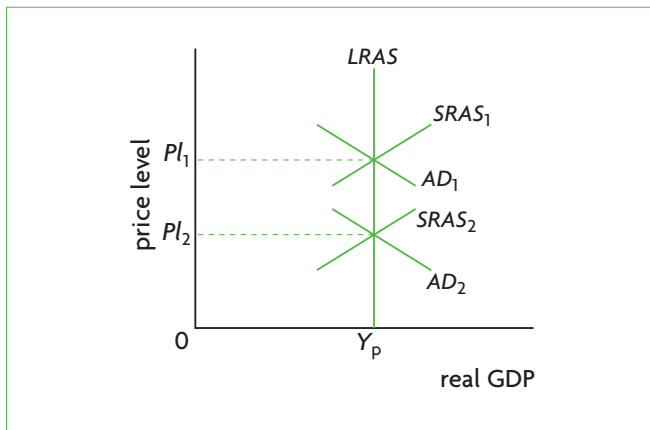
Figure 9.9 Changes in long-run equilibrium in the monetarist/new classical *AD-AS* model
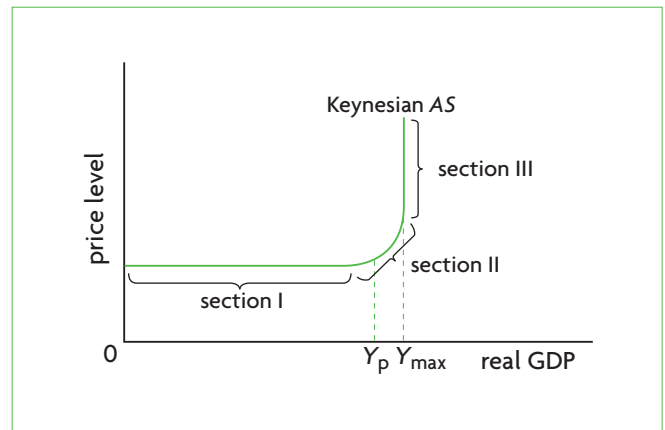
Figure 9.11 The Keynesian aggregate supply curve

(a) Recessionary (deflationary) gap

(b) Inflationary gap

(c) Full employment equilibrium
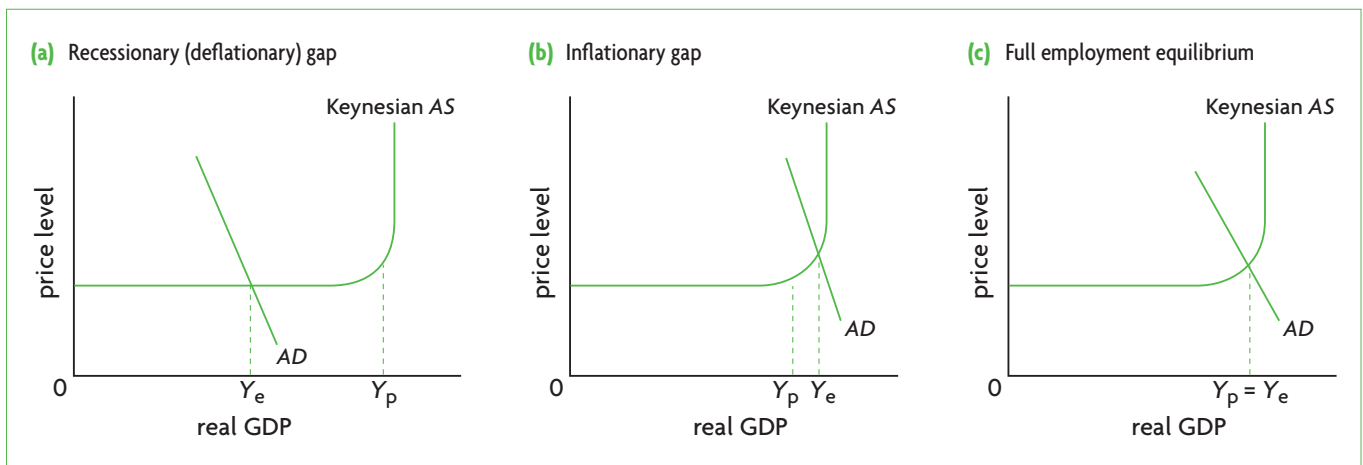
Figure 9.12 Three equilibrium states of the economy in the Keynesian model

(a) The monetarist/new classical model

(b) The Keynesian model
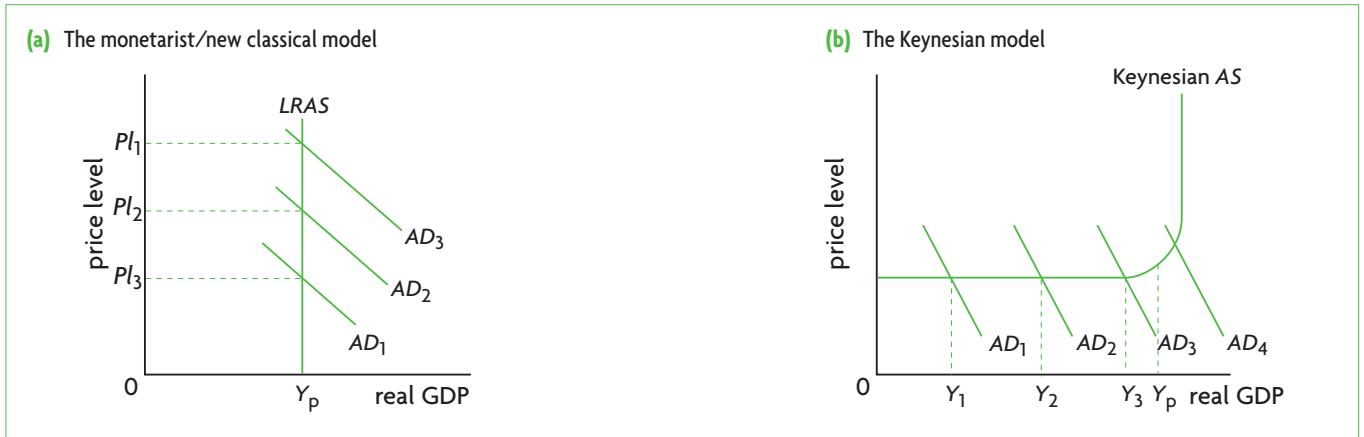
Figure 9.13 Effects of increases in aggregate demand on real GDP and the price level

(a) The monetarist/new classical model

(b) The Keynesian model
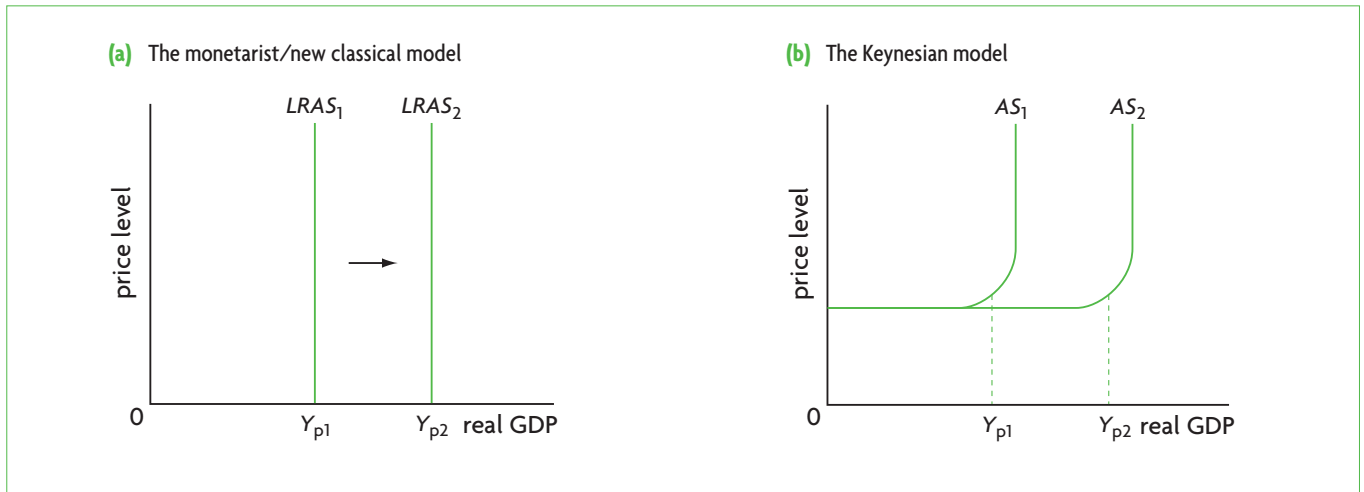
Figure 9.14 Increasing potential output, shifts in aggregate supply curves and long-term economic growth

(a) The monetarist/new classical model

(b) The Keynesian model
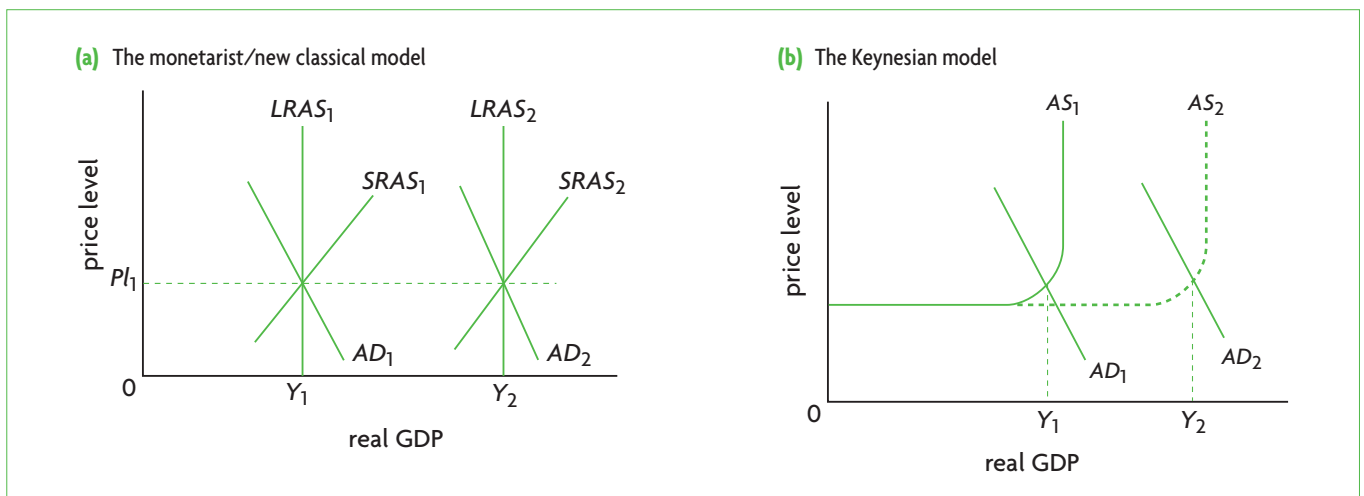
Figure 9.15 Long-term economic growth: achieving potential (full employment) output in a growing economy

Higher level topic
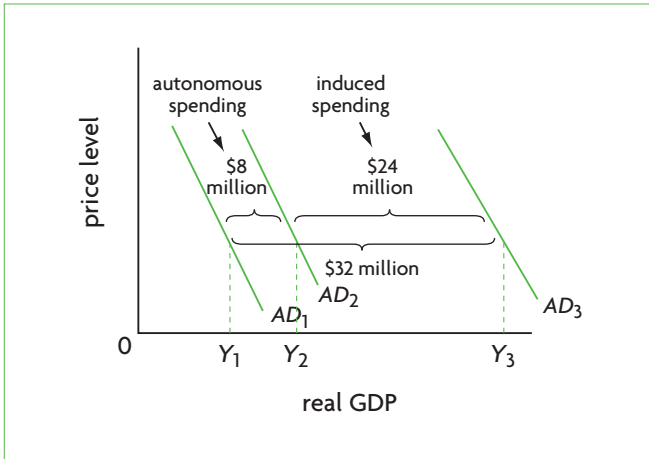
Figure 9.17 Aggregate demand, real GDP and the multiplier in the Keynesian model
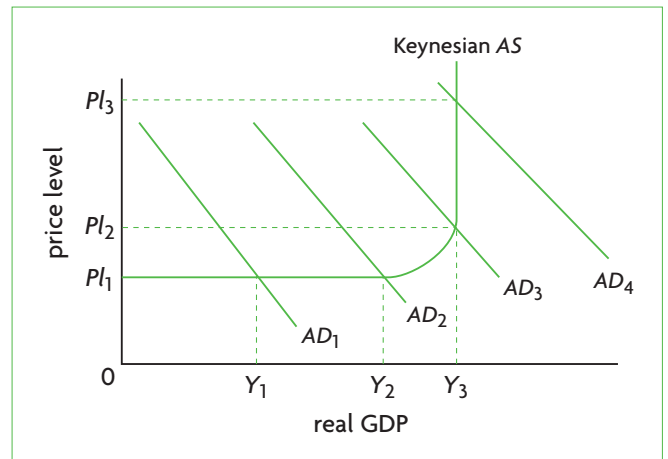
Figure 9.18 How the effect of the multiplier changes depending on the price level

Chapter 10 Macroeconomic objectives I: Low unemployment, low and stable rate of inflation

(a) Fall in demand for a product produced in a declining industry, or produced in a local industry that relocates, causes a fall in Q produced; employers fire workers with inappropriate skills or local workers no longer needed due to relocation

(b) Labour market rigidities lead to an increase in costs of production (supply shifts to the left), causing a fall in Q produced; employers hire fewer workers

(c) Minimum wage legislation and labour union activities lead to higher than equilibrium wages and lower quantity of labour demanded

Figure 10.1 Structural unemployment

(a) The monetarist/new classical model

(b) The Keynesian model
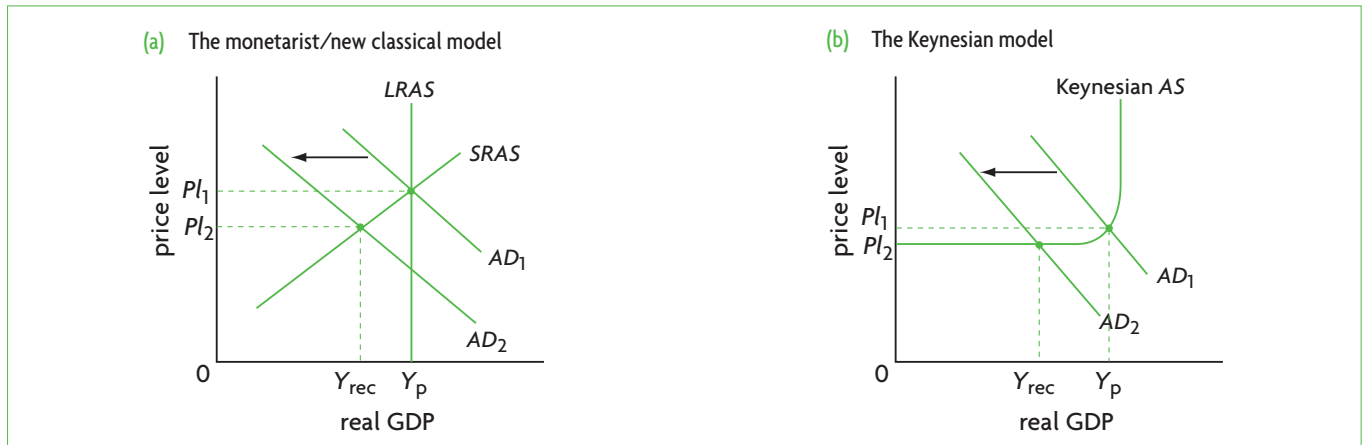
Figure 10.2 Cyclical unemployment

(a) The monetarist/new classical model

(b) The Keynesian model
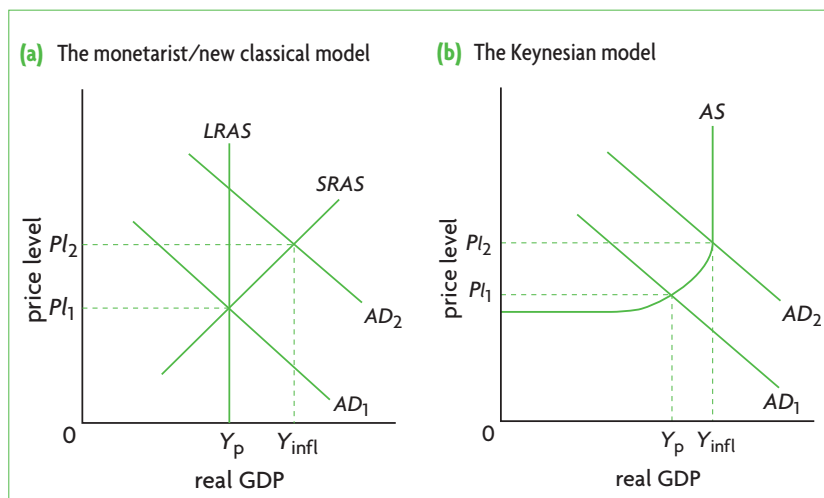
Figure 10.4 Demand-pull inflation
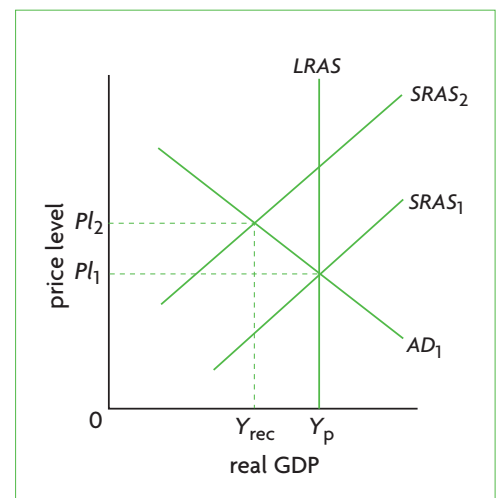
Figure 10.5 Cost-push inflation

(a) The shifting Phillips curve

(b) The reasoning behind *SRAS* shifts in terms of the *AD-AS* model
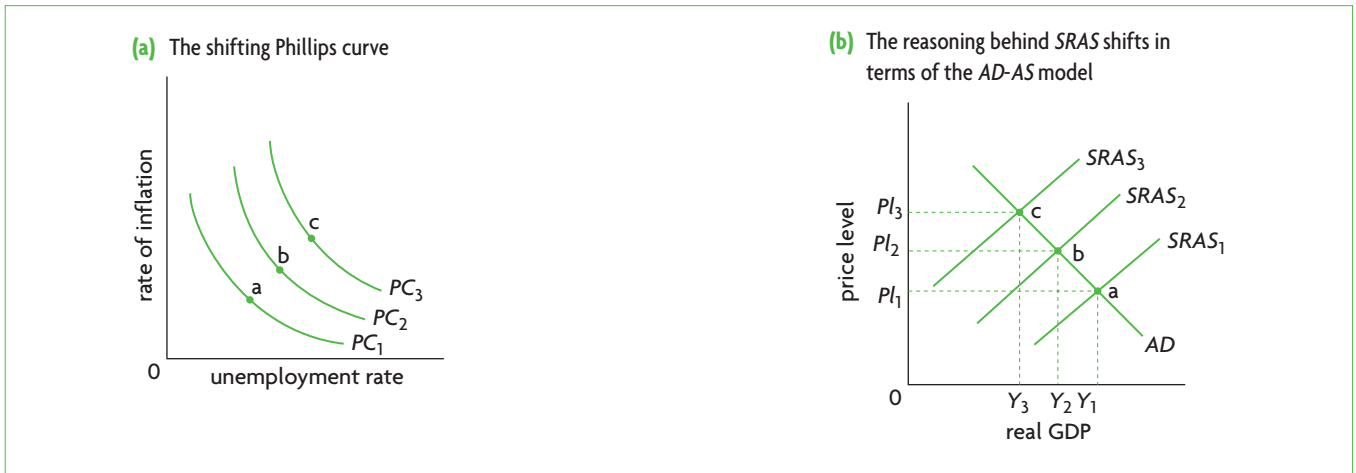
Figure 10.7 Stagflation: outward shifts of the short-run Phillips curve due to decreasing *SRAS*

(a) The shape of the *LRPC* and *SRPC*

(b) The reasoning behind the two curves in terms of the *AD-AS* model

5% = natural rate of unemployment
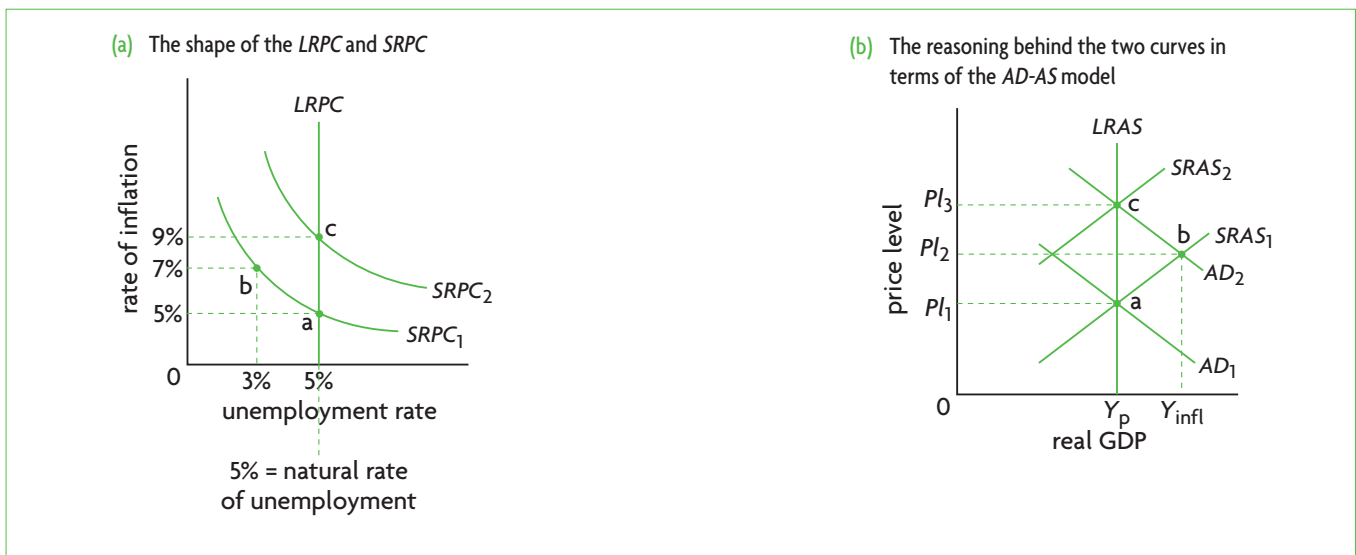
Figure 10.8 The short-run and long-run Phillips curves

Chapter 11 Macroeconomic objectives II: Economic growth and equity in the distribution of income

(a) Economic growth as an increase in actual output caused by reductions in unemployment and productive inefficiency

(b) Economic growth as an increase in production possibilities caused by increases in resource quantities or improvements in resource quality

Figure 11.1 Using the production possibilities model to illustrate economic growth

Figure 11.3 Lorenz curves: Belarus achieves greater income equality than Bolivia

Figure 11.4 Lorenz curves and income redistribution

Chapter 12 Demand-side and supply-side policies

(a) The monetarist/new classical model

LRAS

SRAS

Pl_2
Pl_1
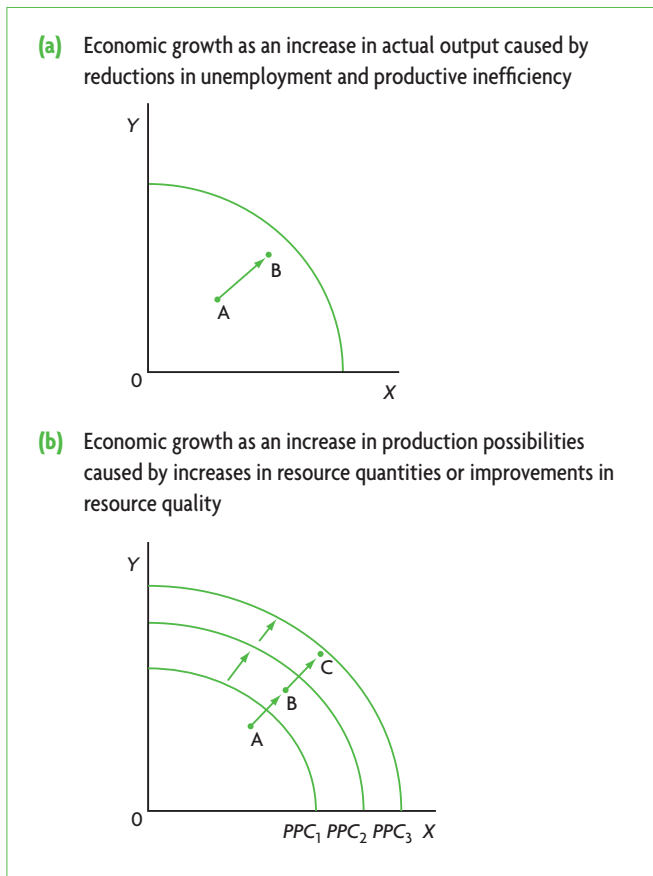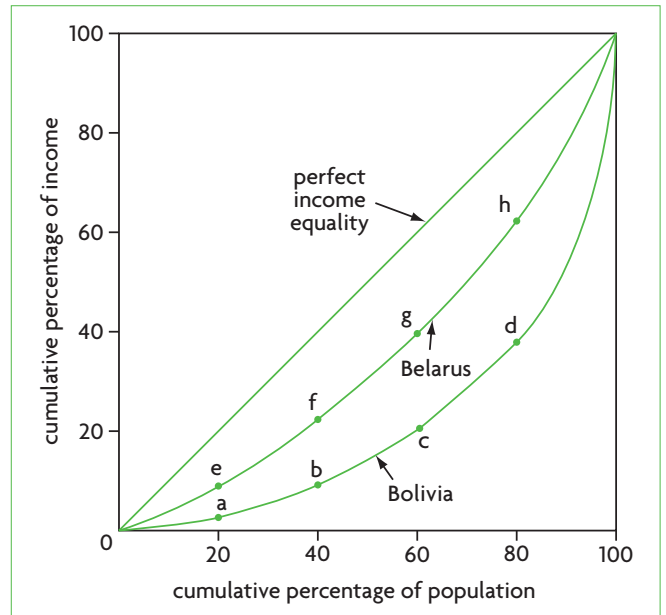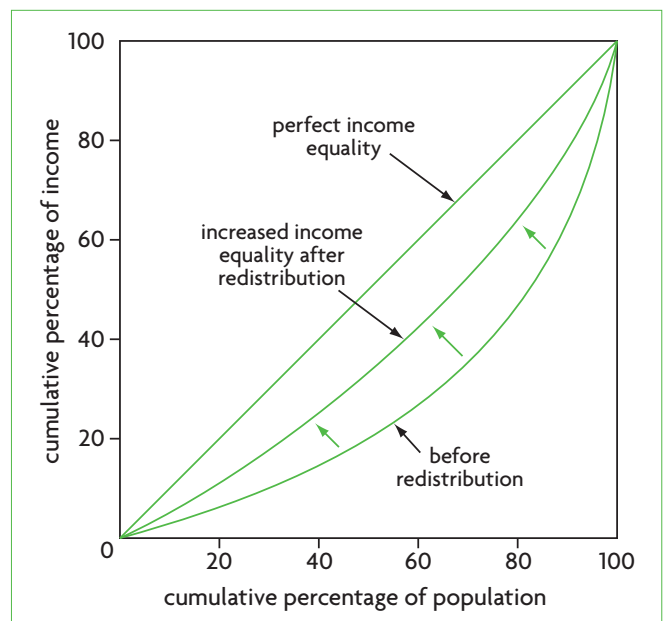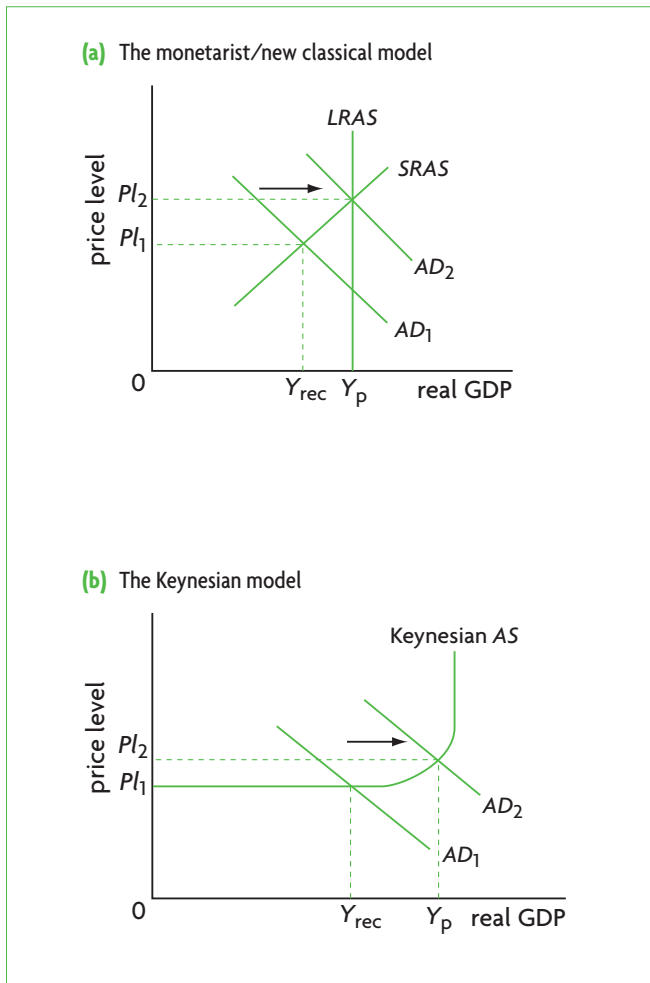
AD_2

AD_1

0   Y_{rec} Y_P real GDP

(b) The Keynesian model

Keynesian *AS*

Pl_2
Pl_1

AD_2

AD_1

0   Y_{rec} Y_P real GDP

Figure 12.1 Effects of expansionary policy: eliminating a recessionary (deflationary) gap

(a) The monetarist/new classical model

LRAS

SRAS

Pl_1
Pl_2

AD_1

AD_2

0   Y_p Y_{infl} real GDP

↑
potential output

(b) The Keynesian model

AS

Pl_1
Pl_2

AD_1

AD_2

0   Y_p Y_{infl} real GDP

↑
potential output
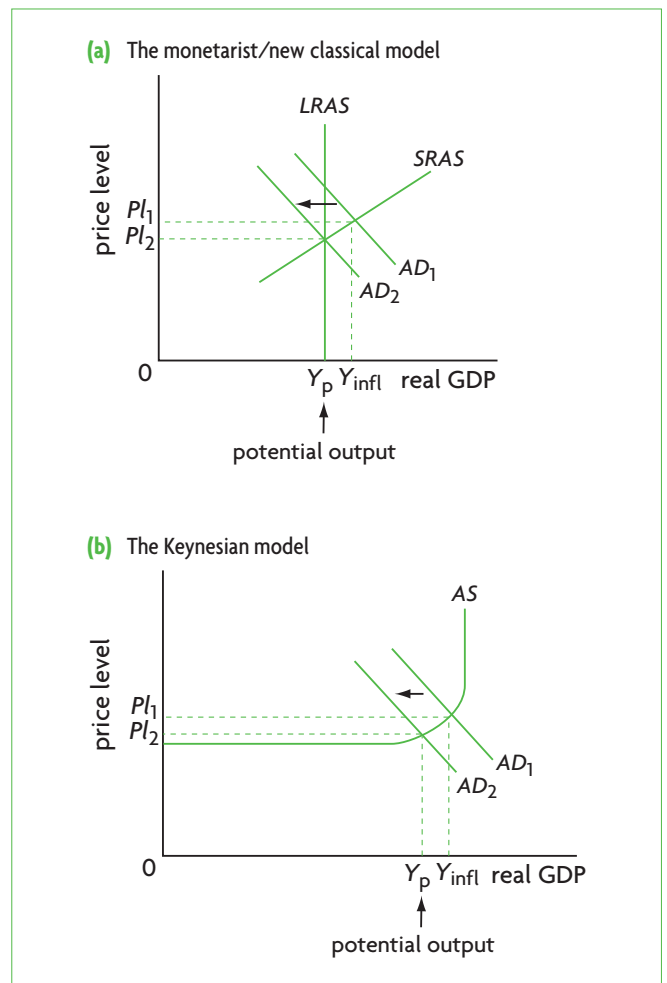
Figure 12.2 Effects of contractionary policy: eliminating an inflationary gap

(a) Partial crowding out

due to G

SRAS

due to I *AD_2*

AD_3

AD_1

0   Y_1 Y_3 Y_2

real GDP

(b) Complete crowding out

due to G

SRAS

due to I *AD_2*

AD_1

0   Y_1 Y_2

real GDP
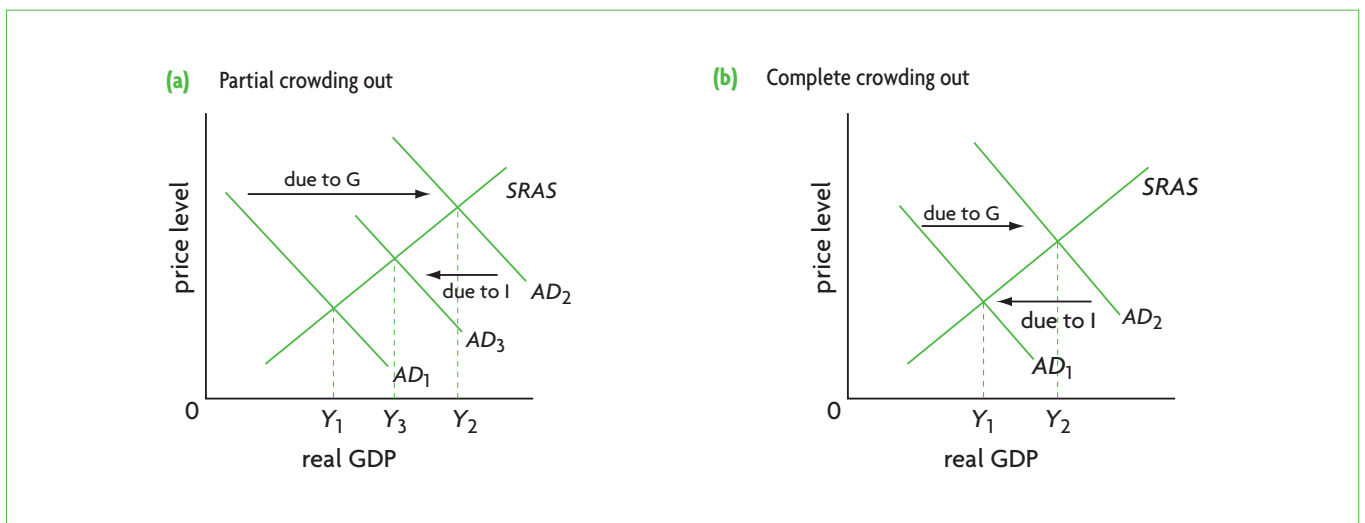
Figure 12.3 Crowding out of private investment

(a) Equilibrium rate of interest

(b) Changes in the supply of money cause changes in the equilibrium rate of interest

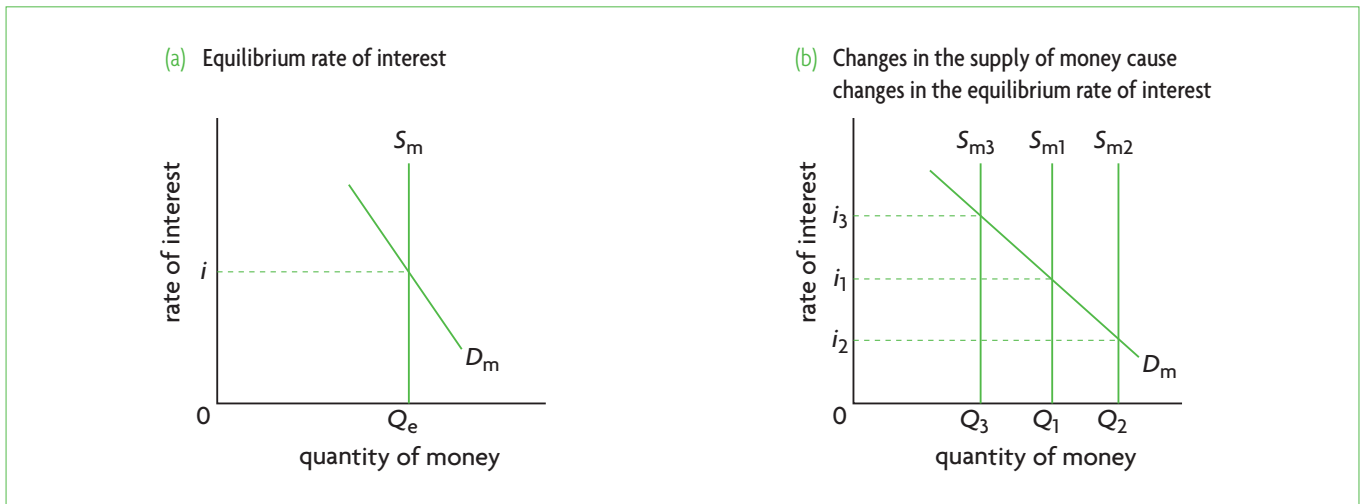**Figure 12.4** The money market and determination of the rate of interest

Chapter 13 International trade

(a) Country A: absolute advantage in good Y; Country B: absolute advantage in good X

(b) Country A: comparative advantage in good Y; Country B: comparative advantage in good X

Figure 13.5 Identical opportunity costs: no gains from trade

Figure 13.3 Absolute and comparative advantage

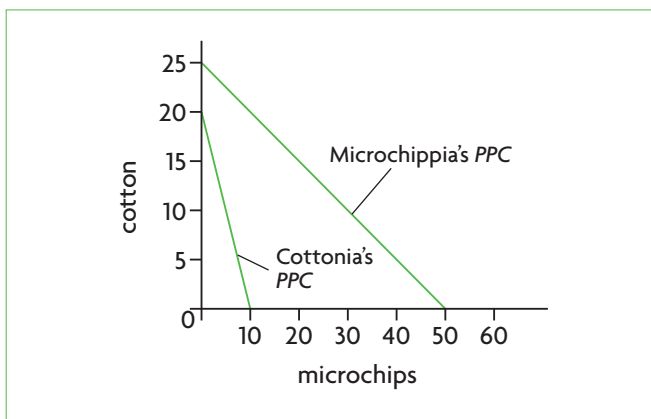|	Production possibilities when each country produces only cotton or only microchips		Opportunity cost of cotton	Opportunity cost of microchips
	(1) Cotton	(2) Microchips	(3)	(4)
Cottonia	20 or	10	$\dfrac{10 \text{ units of microchips}}{20 \text{ units of cotton}} = \dfrac{1}{2}$	$\dfrac{20 \text{ units of cotton}}{10 \text{ units of microchips}} = 2$
Microchippia	25 or	50	$\dfrac{50 \text{ units of microchips}}{25 \text{ units of cotton}} = 2$	$\dfrac{25 \text{ units of cotton}}{50 \text{ units of microchips}} = \dfrac{1}{2}$

Table 13.2 Comparative advantage
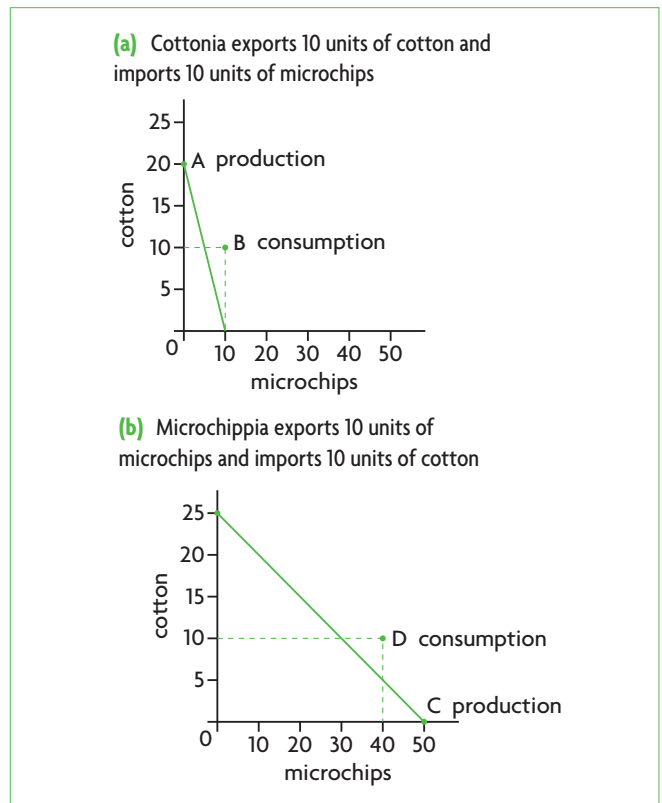

Figure 13.2 Comparative advantage

(a) Cottonia exports 10 units of cotton and imports 10 units of microchips

(b) Microchippia exports 10 units of microchips and imports 10 units of cotton

Figure 13.4 The gains from specialisation and trade based on comparative advantage: both countries consume outside their *PPC*

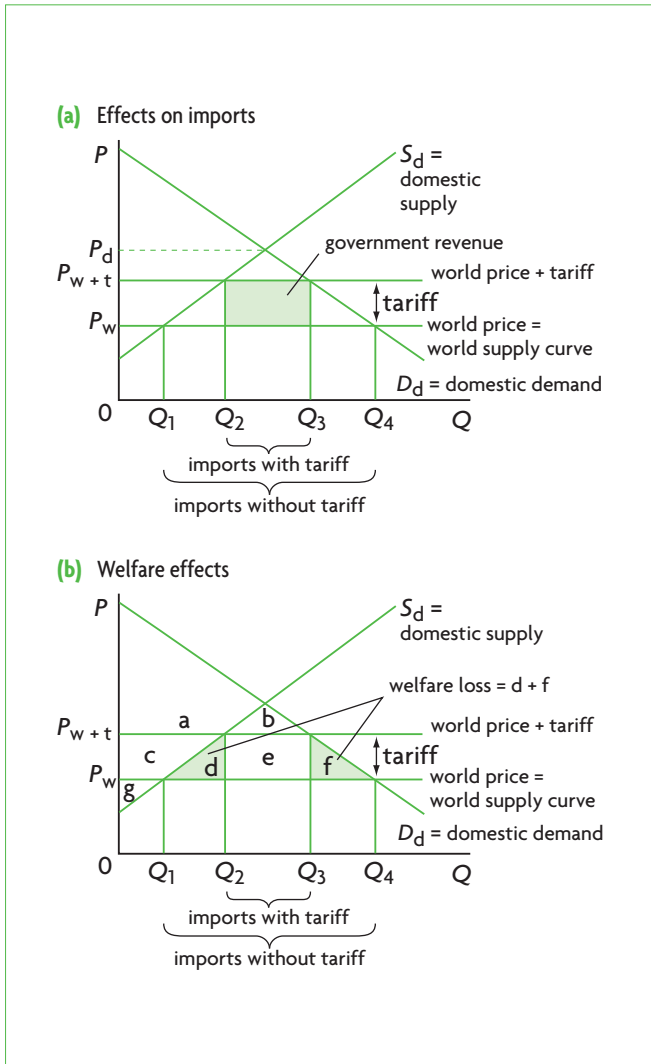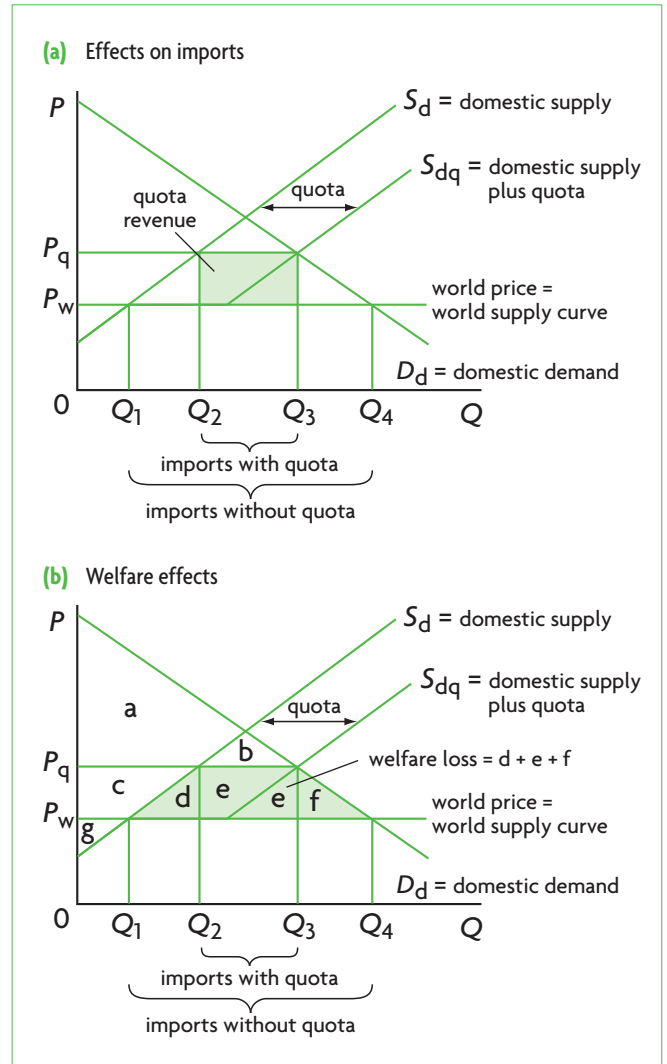**(a) Effects on imports**

(b) Welfare effects

Figure 13.7   Effects of a tariff

(a) Effects on imports

(b) Welfare effects

Figure 13.9   Effects of a quota

(a) Production subsidy: quantity of imports falls
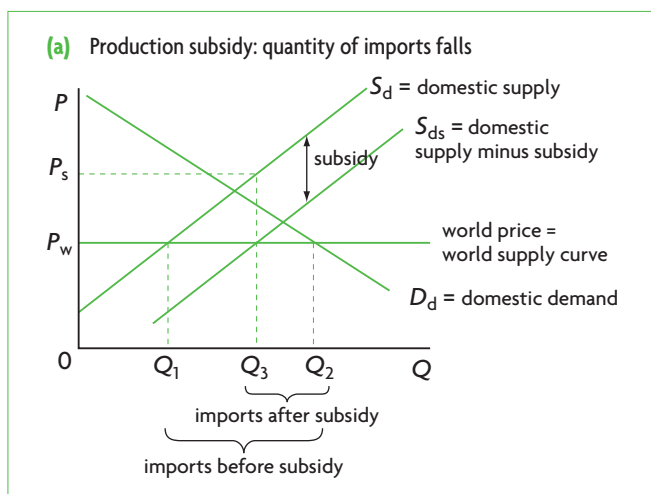
Figure 13.11   Production subsidies

Chapter 14 Exchange rates and the balance of payments

(a) The market for US dollars

(b) The market for euros
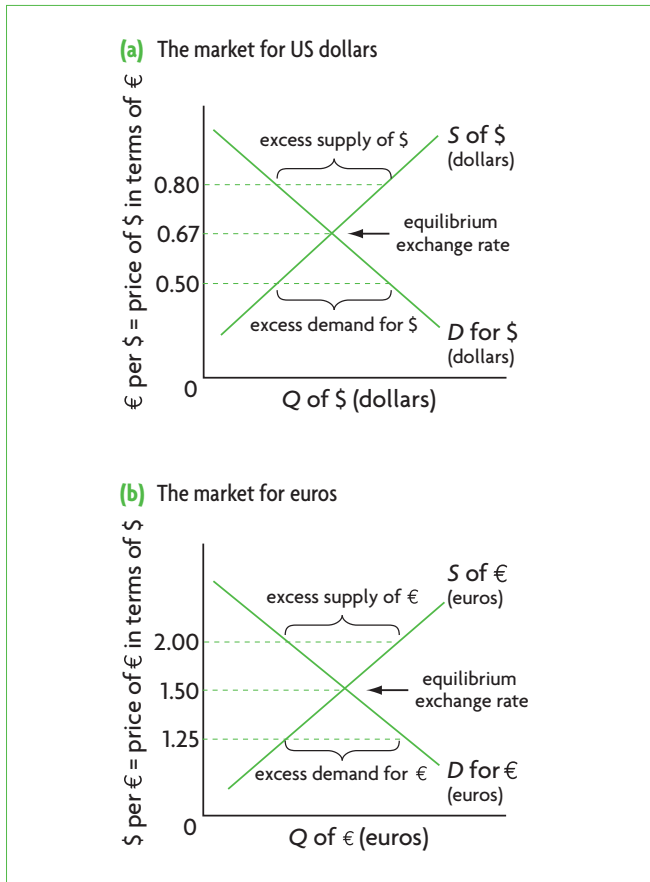
Figure 14.1 Exchange rate determination in a freely floating exchange rate system

(a) Demand for $ increases: $ appreciates

(b) Supply of € increases: € depreciates
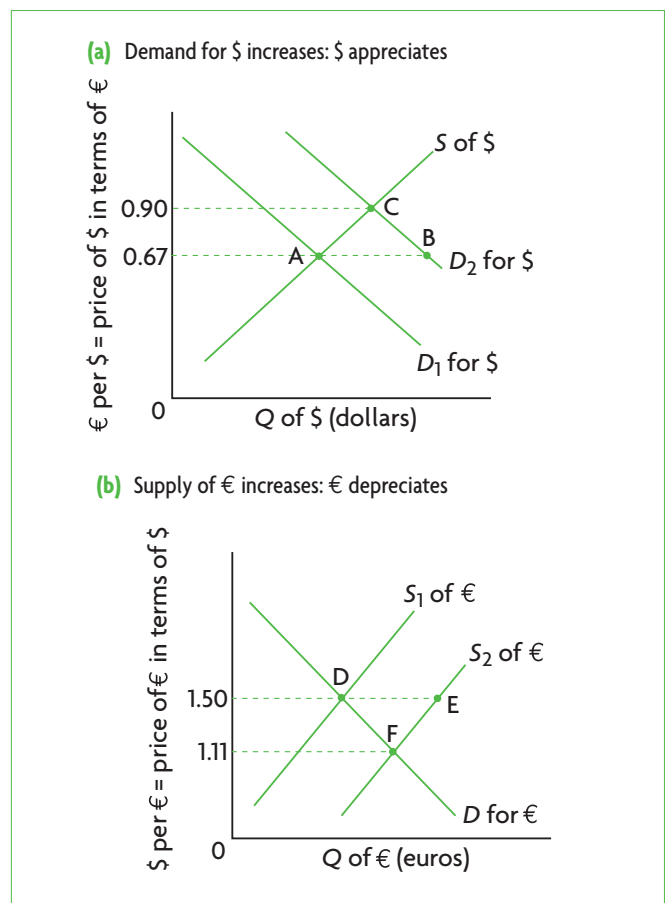
Figure 14.2 Exchange rate changes in a freely floating exchange rate system

(a) Shifting the currency demand curve

(b) Shifting the currency supply curve
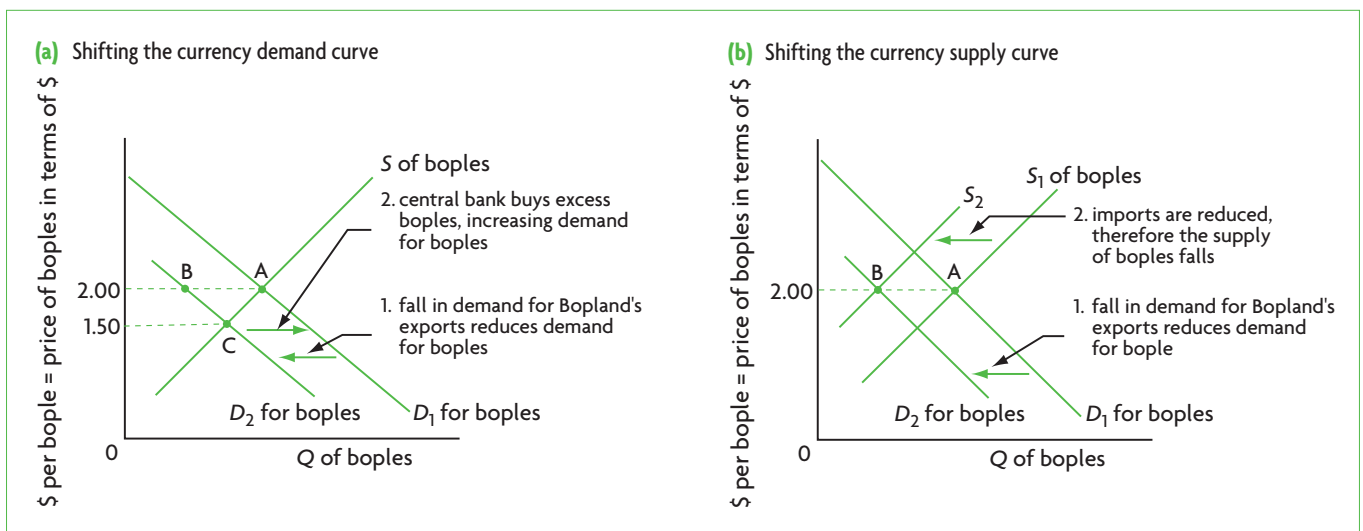
Figure 14.3 Fixed exchange rates: maintaining the value of the bople at 1 bople = $2.00

(a) With a trade deficit, country consumes outside its *PPC*

good A

•C

PPC

0

good B

(b) With a trade surplus, country consumes inside its *PPC*
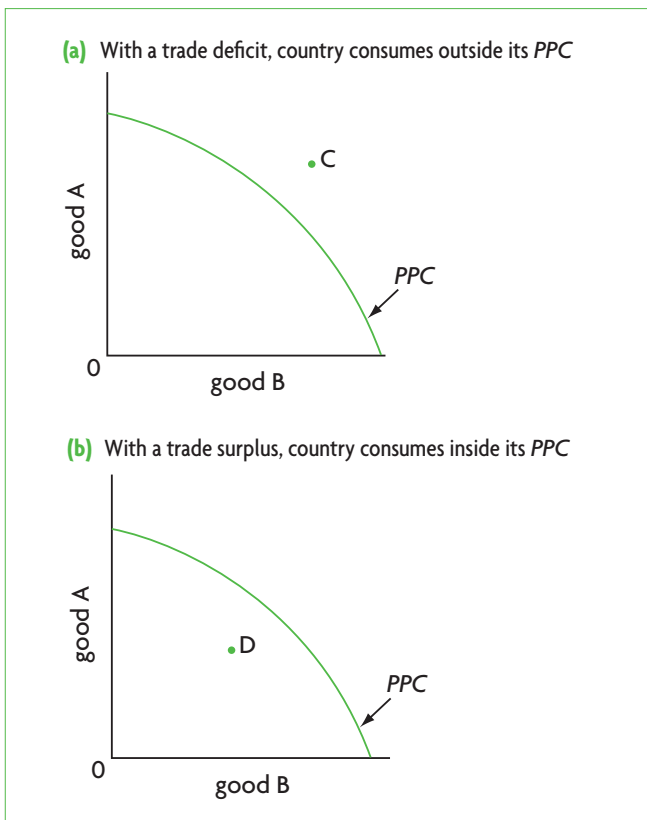
good A

•D

PPC

0

good B

Figure 14.6 Using a *PPC* to illustrate a trade deficit and a trade surplus

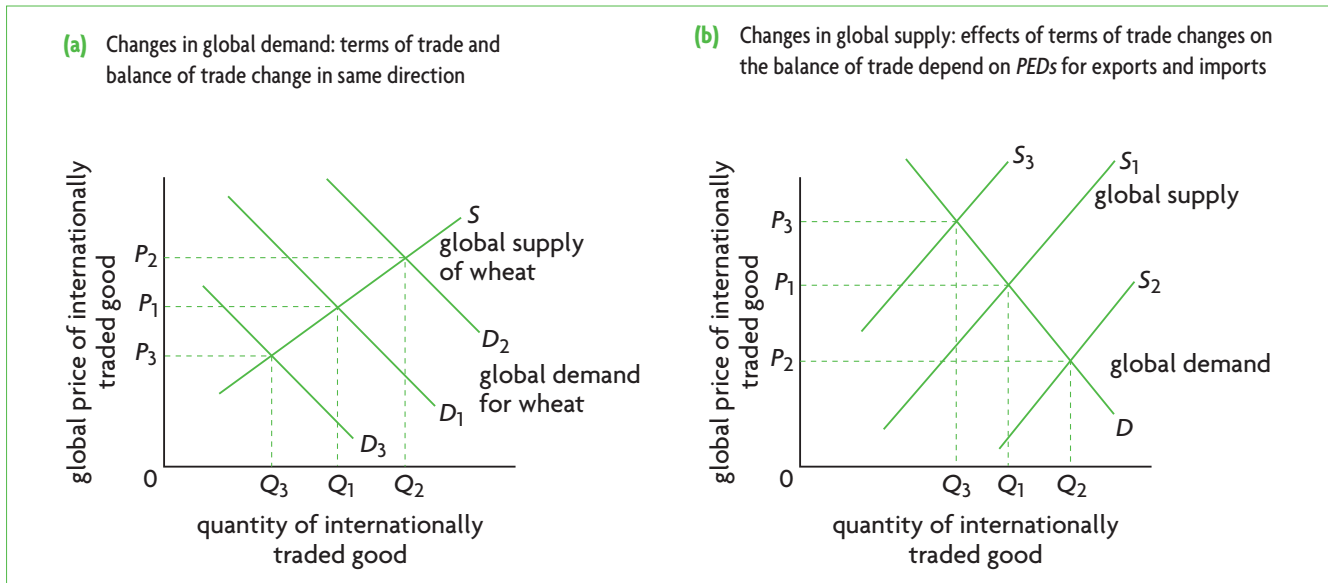# Chapter 15 Economic integration and the terms of trade

Higher level topic

(a) Changes in global demand: terms of trade and balance of trade change in same direction

(b) Changes in global supply: effects of terms of trade changes on the balance of trade depend on *PEDs* for exports and imports

Figure 15.1 Changes in global demand or supply: terms of trade impacts on the balance of trade
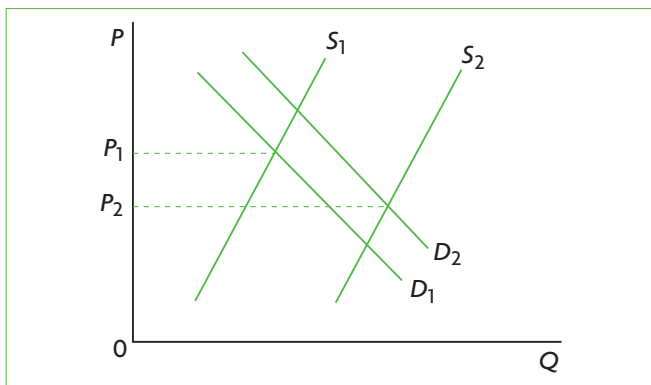

Figure 15.2 Long-term declines in primary product prices due to low growth in demand (due to low *YED*s) and high growth in supply (due to technological advances)

Chapter 16 Understanding economic development

A→B: no economic growth with some development
B→C: economic growth with no development
B→D or E: economic growth with development

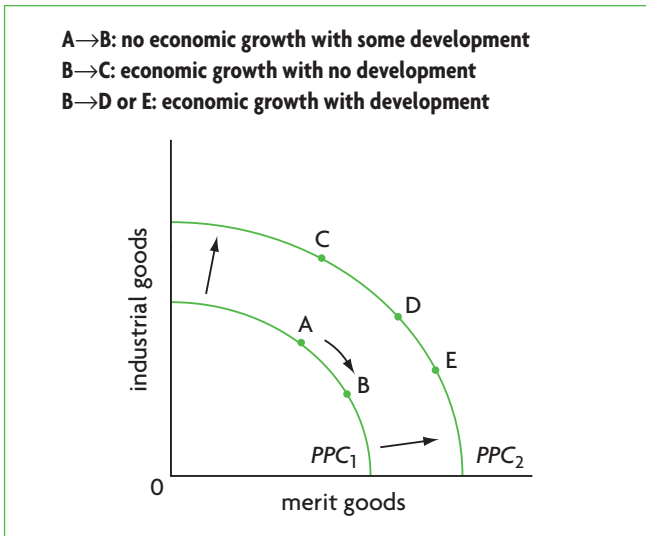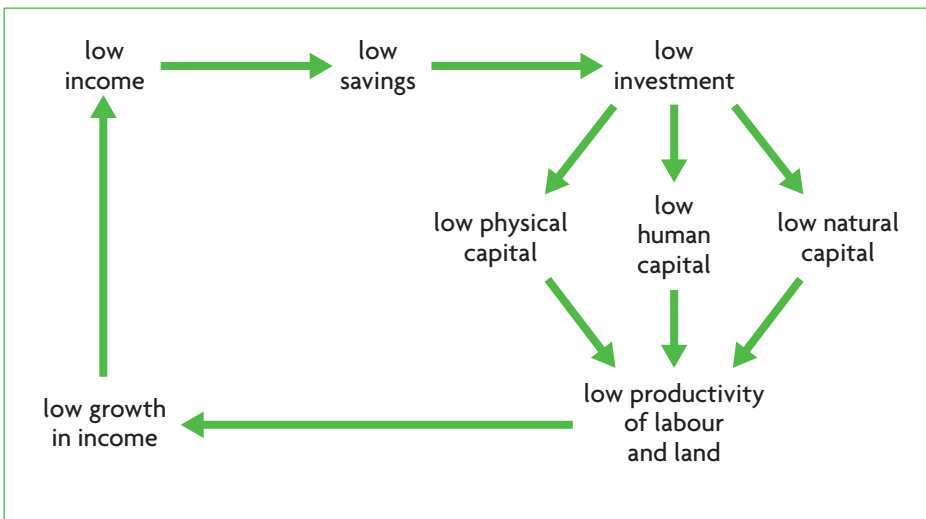**Figure 16.1** Economic growth and economic development

Figure 16.2 The poverty cycle (poverty trap)