ELEVENTH EDITION

ECONOMICS

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ECONOMICS

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Eleventh edition

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NOTE THAT ANY PAGE CROSS REFERENCES REFER TO THE PRINT EDITION

About the Authors

John Sloman is Visiting Fellow at the University of Bristol and Associate of the Economics Network (www.economicsnetwork.ac.uk), a UK-wide organisation, where, until his retirement in 2012, he was Director. The Economics Network is based at the University of Bristol and provides a range of services designed to promote and share good practice in learning and teaching economics. The Network is supported by grants from the Royal Economic Society, the Scottish Economic Society and university economic departments and units from across the UK.

John is also Visiting Professor at the University of the West of England, Bristol, where, from 1992 to 1999, he was Head of School of Economics. He taught at UWE until 2007.

John has taught a range of courses, including economic principles on Economics, Social Science and Business Studies degrees, development economics, comparative economic systems, intermediate macroeconomics and managerial economics. He has also taught economics on various professional courses.

John is the co-author with Dean Garratt of *Essentials of Economics* (Pearson Education, 8th edition 2019); with Dean Garratt, Elizabeth Jones of the University of Warwick and Jon Guest of *Economics for Business* (Pearson Education, 8th edition 2019); and with Elizabeth Jones of *Essential Economics for Business* (Pearson Education, 6th edition 2020). Translations or editions of the various books are available for a number of different countries with the help of co-authors around the world.

John is very interested in promoting new methods of teaching economics, including group exercises, experiments, role playing, computer-aided learning and the use of audience response systems and podcasting in teaching. He has organised and spoken at conferences for both lecturers and students of economics throughout the UK and in many other countries.

As part of his work with the Economics Network he has contributed to its two sites for students and prospective students of economics: Studying Economics (www.studyingeconomics.ac.uk/) and Why Study Economics? (http://whystudyeconomics.ac.uk).

From March to June 1997, John was a visiting lecturer at the University of Western Australia. In July and August 2000, he was again a visiting lecturer at the University of Western Australia and also at Murdoch University in Perth.

In 2007, John received a Lifetime Achievement Award as 'outstanding teacher and ambassador of economics', presented jointly by the Higher Education Academy, the Government Economic Service and the Scottish Economic Society.

Dr Dean Garratt is a Senior Teaching Fellow at Aston Business School having previously been a Principal Lecturer at Nottingham Business School. Dean teaches economics at a variety of levels, including modules in macroeconomics and economic principles for business and management students.

He is passionate about encouraging students to communicate economics more intuitively, to deepen their interest in economics and to apply economics to a range of issues.

Earlier in his career Dean worked as an economic assistant at both HM Treasury and at the Council of Mortgage Lenders (now known as UK Finance). While at these institutions he was researching and briefing on a variety of issues relating to the household sector and to the housing and mortgage markets.

Dean is a Senior Fellow of the Higher Education Academy and an Associate of the Economics Network which aims to promote high-quality teaching practice. He has been involved in several projects promoting a problem-based learning (PBL) approach in the teaching of economics.

In 2006, Dean was awarded the Outstanding Teaching Prize by the Economics Network. The award recognises exemplary teaching practice that deepens and inspires interest in economics. In 2013, he won the student-nominated Nottingham Business School teacher of the year award.

Dean has worked as an academic assessor for the Government Economic Service (GES) helping to assess candidates at Economic Assessment Centres (EACs). He has also run sessions on HM Treasury's Graduate Development Programme (GDP) on principles in policy making and contemporary developments in macroeconomics.

Outside of work, Dean is an avid watcher of many sports. Having been born in Leicester, he is a season ticket holder at both Leicester City Football Club and Leicestershire County Cricket Club.

Jon Guest is a Senior Teaching Fellow at Aston Business School and a Teaching Associate at Warwick Business School. He joined Aston University in September 2017 having previously been a Senior Lecturer at Nottingham Business School, a Principal Teaching Fellow at Warwick Business School and a Senior Lecturer at Coventry University.

Jon has taught on a range of courses including Principles of Microeconomics, Intermediate Microeconomics, Economic Issues and Behavioural Economics. He has also taught economics on various professional courses for the Government Economic Service and HM Treasury.

Jon has worked on developing teaching methods that promote a more active learning environment in the classroom. In particular, he has published journal articles and carried out a number of funded research projects on the impact of games and experiments on student learning. These include an online version of the TV show *Deal or No Deal* and games that involve students acting as buyers and sellers in the classroom. He has recently included a series of short videos on economics topics and implemented elements of the flipped classroom into his teaching. Jon is also interested in innovative ways of providing students with feedback on their work.

Through his work as an Associate of the Economics Network, Jon has run sessions on innovative pedagogic practices at a number of universities and major national events. He is also an academic assessor for the Economics Assessment Centres run by the Government Economic Service. This involves interviewing candidates and evaluating their ability to apply economic reasoning to a range of policy issues. He has also acted as an External Examiner for a number of UK universities.

The quality of his teaching was formally recognised when he became the first Government Economic Service Approved Tutor in 2005 and won the student-nominated award from the Economics Network in the same year. Jon was awarded the prestigious National Teaching Fellowship by the Higher Education Academy in 2011.

Jon is a regular contributor and editor of the *Economic Review* and is a co-author of the 8th edition of the textbook *Economics for Business*. He has published chapters in books on the economics of sport and regularly writes cases for the 'Sloman in the News' website. He has also published research on the self-evaluation skills of undergraduate students.

Outside of work Jon is a keen runner and has completed the London Marathon. However, he now has to accept that he is slower than both of his teenage sons – Dan and Tom. He is also a long-suffering supporter of Portsmouth Football Club.

Brief Contents

Contents

Supporting Resources

Visit go.pearson.com/uk/sloman to find valuable online resources:

MyLab Economics

For students

- Study guide with exercises, quizzes and tests, arranged chapter by chapter
- Multiple-choice questions to test your learning
- Audio animations to illustrate key economic concepts and models
- Link to Sloman Economics News site
- Online textbook chapters
- Link to additional resources on the companion website (listed below)

For lecturers

- MyLab's gradebook, which automatically tracks student performance and progress
- Extensive test bank, allowing you to generate your own tests, assessments and homework assignment
- Access to a wealth of lecturer resources on the companion website (listed below)

Companion website

For students

- Answers to all in-chapter questions in the book
- Over 220 case studies with questions and activities, organised by chapter
- Over 130 audio animations explaining all the key models used in the book
- Regularly updated and searchable blog, featuring current news items with discussion of the issue, questions and links to articles and data
- Hotlinks to 284 sites relevant to the study of economics
- Maths case studies illustrating the key mathematical concepts used in the book

For lecturers

- Comprehensive range of PowerPoint slides, including figures and tables from the book, as well as animated slide shows for use in lectures, organised chapter by chapter. There are various versions of these slide shows, some including questions that can be used with 'clickers', phones or other smart devices
- Animated key models in PowerPoint
- Teaching and learning case studies, discussing ways of increasing student engagement and improving student learning
- 20 workshops in Word for use in large or small classes, plus a guide on ways of using the workshops. These can easily be customised to suit lecturers' needs. Answers are given to all the workshop questions
- Over 220 case studies with questions and student activities (as on student website). Answers to all questions in case studies
- Answers to all questions in the book (end-of-chapter questions, box questions and in-text questions) and to questions in maths case studies

Also: The companion website provides the following features:

- Search tool to help locate specific items of content
- Online help and support to assist with website usage and troubleshooting

For more information please contact your local Pearson Education sales representative or visit go.pearson.com/uk/sloman.

Preface

Economics affects all our lives. This has been dramatically brought home to us by the coronavirus pandemic. Governments imposed lockdowns and other restrictions. Many people lost their jobs or were put on furlough. Firms went out of business. Working lives changed and many switched to working online. Governments spent vast amounts of money, thereby increasing their debts. Later they tried to find ways of clawing down these debts, whether by raising taxes or cutting government expenditure.

We are all faced with economic questions and decisions. As consumers we try to make the best of our limited incomes. As workers – or future workers – we take our place in the job market. As citizens of a country our lives are affected by the decisions of our government and other policy makers: decisions over taxes, decisions over spending on health and education, decisions on interest rates, decisions that affect unemployment, inflation and growth. As dwellers on the planet Earth we are affected by the economic decisions of each other: the air we breathe, the water we drink and the environment we leave to our children are all affected by the economic decisions taken by the human race.

Economics thus deals with some of the most challenging issues we face. It is this that still excites us about economics after many years of teaching the subject. We hope that some of this excitement rubs off on you.

The first ten editions of *Economics* have been widely used in Britain and throughout the world. Like them, this eleventh edition is suitable for all students of economics at first-year degree level, A level or on various professional courses where a broad grounding in both principles and applications is required. It is structured to be easily understood by those of you who are new to the subject, with various sections and boxes that can be left out on first reading or on shorter courses; yet it also has sufficient depth to challenge those of you who have studied the subject before, with starred sections (appearing on a grey background) and starred case studies that will provide much that is new. There are also optional short mathematical sections for those of you studying a more quantitatively focused course.

The book gives a self-contained introduction to the world of economics and is thus ideal for those who will not study the subject beyond introductory level. But by carefully laying a comprehensive foundation and by the inclusion of certain materials in starred sections that bridge the gap between introductory and second-level economics, it provides the necessary coverage for those of you going on to specialise in economics.

The book looks at the world in the 2020s. Despite huge advances in technology and despite the comfortable lives led by many people in the industrialised world, we still suffer from unemployment, poverty and inequality, and in many countries (the UK included) the gap between rich and poor has grown much wider; our environment is polluted and the world is facing a climate emergency; our economy still goes through periodic recessions; conflict and disagreement often dominate over peace and harmony.

In today's world there are many challenges that face us, including:

- A growing interdependence of the economies of the world, with a seemingly inexorable process of 'globalisation', which links us all through a web of telecommunications and international trade into a world of Amazon, Facebook, Coca-Cola, Nike trainers, Google, Netflix and the English Premier League.
- Coping with the effects of the coronavirus (COVID-19) pandemic and its aftermath.
- New challenges for the UK now it has left the EU.
- A rise in populism as the lower paid and unemployed see their incomes stagnating while the wealthy get richer. This has led to many people calling for policies to protect their jobs and communities from cheap imports.
- Large-scale migration of people across and within continents placing pressures on resources, but also creating new economic opportunities.
- Evidence that economic problems spread like a contagion around the world, tying domestic economic growth to global events.
- The effects of financialisation, by which we mean the increasing economic importance of the financial sector,

and its impact on the financial health of people, businesses and governments as well as its potential to destabilise economies.

- The continuing hangover from the turmoil on international financial markets that culminated in the banking crisis of 2007–8, with many countries today still trying to tackle high levels of public and private debt, made worse by government spending to mitigate the effects of the COVID-19 pandemic.
- Rapid economic growth of some developing countries, such as India and China, which are increasingly influential in the global economy.
- A move away from the ideological simplicity of a 'free-market' solution to all economic problems.
- An EU struggling to reform its institutions and processes and to stimulate economic growth.
- An ever-deepening crisis for many of the poorest developing countries, often ravaged by disease, conflict and famines, and seemingly stuck in a cycle of poverty.
- A world struggling to tackle climate change and cope with its economic, social and ecological consequences.

Economists are called on to offer solutions to these and many other problems. We shall be seeing what solutions economists can offer as the book progresses.

But despite our changing environment, there are certain economic fundamentals that do not change. Although there are disagreements among economists – and there are plenty – there is a wide measure of agreement on how to analyse these fundamentals.

Critical thinking and employability

When you are approaching graduation and start applying for jobs, you will need to demonstrate to potential employers that you have the range of skills necessary for analysing and solving problems and for communicating ideas and solutions to colleagues and clients. This requires the ability to think critically and to apply core concepts and ideas to new situations. Universities recognise this and 'employability' is a key objective of courses nowadays.

Employability is a core focus of this book. Critical thinking is developed through questions positioned throughout the text to encourage you to reflect on what you have just read and thereby improve and deepen your learning. Answers to these questions are freely available on the website to enable you to check your progress. Critical thinking is also developed through the use of Boxes of case studies and applications occurring several times in each chapter. These apply the economics you're learning to a variety of real-world issues and data. There are many additional case studies with questions on the student website.

If your lecturer recommends the use of MyEconLab to accompany the text, you will find there large banks of additional questions and the ability to monitor your progress.

These questions enable you to reflect on your learning and on where additional work is required.

Critical thinking is also encouraged through the use of 15 'threshold concepts'. These are core ideas and concepts that recur throughout economics. Understanding and being able to apply these core economic concepts helps you to 'think like an economist' and to relate the different parts of the subject to each other. An icon appears in the margin wherever the concept recurs so that you can easily recognise its use in a new context.

In addition there are 40 'key ideas' that encourage you to relate new material to a toolkit of ideas. Again, there are icons in the margin to help you identify the relevant idea.

The whole way through the book, you are encouraged to reflect on your learning, to apply it to the real world and to use real-world data to make sense of economic issues and problems.

In addition to the book, there is a news blog with news items added several times per month. Each blog post discusses economic issues in the news and relates these news items to key economic concepts and theories. Links are given to a range of articles, videos, podcasts, data and reports and each blog post finishes with a set of discussion questions. You can access the blog from the book's website at go.pearson.com/uk/sloman. Archived articles go back many months. You can also search the news articles by key word, chapter of this book or by month. Again, the use of real-world news topics, questions and data helps you apply the theories and ideas you will learn in this book and develop these all-important critical thinking skills that are so central to employability.

In terms of employability, employees who can think flexibly and apply concepts and theories in new and perhaps strange situations to analyse and solve problems will be much more valuable to their employer. This book helps you to develop these skills. What is more, the use of data in the book and in the blogs and other web resources, and the hyperlinks in the e-text to data sources and relevant articles, will allow you to gain experience in using evidence to support and assess arguments.

Employers value these problem-solving skills. Indeed, they like to employ graduates with an economics degree, or some element of economics in their degree, because of the skills you will develop. And it's not just for jobs as economists, but for a large number of professions where studying economics is seen to equip you with a valuable set of skills that are transferable to a range of non-economics situations.

We hope that this book will give you an enjoyable introduction to the economist's world and that it will equip you with the tools to understand and criticise the economic policies that others pursue.

Good luck and have fun.

John, Dean and Jon

TO LECTURERS AND TUTORS

In the light of the financial crisis and the struggle of many countries to tackle its aftermath, there has been much soul-searching amongst economists about the appropriateness of the models we use and what should be taught to our students. These concerns were debated at an international conference at the Bank of England in 2012. One outcome of this was the publication of a book, *What's the Use of Economics?*[1] This considers how undergraduate courses could be reformed to meet the needs of employers and how economic models and syllabuses could be revised to reflect the real world and to provide a foundation for devising effective economic policy. A second, follow-up conference, *Revisiting the State of Economics Education*, took place at the Bank of England in 2015 and the debate continues.[2]

We have attempted to address these concerns in the past three editions of this book and have gone further still in this new edition. In particular, we have incorporated recent developments in macroeconomics, including stressing the importance of balance sheets, credit cycles, financial instability and systemic risk, the increased use of the *DAD/DAS* framework and the integration of the expectations-augmented Phillips curve and the *IS/MP* model. But these have been treated at a level wholly suitable for first-year students.

We have also given further weight to behavioural economics in analysing the behaviour of both consumers, firms and workers. In particular, there is more detailed discussion of loss aversion and the endowment effect, present bias and self-control issues, reference points and biases when making decisions under conditions of uncertainty. Indeed, Chapter 5 on behavioural economics has been completely reworked for this edition. More weight is given to the importance of institutional structures and culture and we have also strengthened microeconomic analysis in several places, such as game theory and price discrimination.

We have also thoroughly revised the applied chapters and sections to reflect changes in policies. For example, we have included the implications of the Brexit vote and the UK's subsequent exit from the EU and also of the Trump and Biden administrations' policies in several parts of the book.

In addition, we show how many of the theories developed to explain the problems that existed at the time and how they have evolved to reflect today's issues. We have thus continued to emphasise the link between the history of economic thought and economic history.

1 Diane Coyle (ed.), *What's the Use of Economics?* London Publishing Partnership (2012).

2 Peter Day, 'Are economics degrees fit for purpose?', *BBC News* (5 February 2016).

This new edition also retains many of the popular features of the previous edition:

- A style that is direct and to the point, with the aim all the time to provide maximum clarity. There are numerous examples to aid comprehension.

- All economic terms highlighted in the text where they first appear and defined at the foot of that page. Each term is also highlighted in the index, so that the student can simply look up a given definition as required. By defining them on the page where they appear, the student can also see the terms used in context in the text.

- Key ideas highlighted and explained when they first appear. There are 40 of these ideas, which are fundamental to the study of economics. Students can see them recurring throughout the book, and an icon appears in the margin to refer back to the page where the idea first appears.

- Fifteen 'threshold concepts'. Understanding and being able to relate and apply these core economic concepts helps students to 'think like an economist' and to relate the different parts of the subject to each other. Again, an icon appears in the margin wherever the concept recurs.

- A wealth of applied material in boxes (172 in all), making learning more interesting for students and, by relating economics to the real world, bringing the subject alive. The boxes allow the book to be comprehensive without the text becoming daunting and allow more advanced material to be introduced where appropriate. Many of the boxes can be used as class exercises and virtually all have questions at the end.

- Extensive use of data, with links in the online version to general data sources and individual datasets, with many opportunities for students to explore data to help them reflect on policy choices.

- Full-page chapter introductions. These set the scene for the chapter by introducing the students to the topics covered and relating them to the everyday world. The introductions also include a 'chapter map'. This provides a detailed contents listing, helping students to see how the chapter is structured and how the various topics relate to each other.

- A consistent use of colour in graphs and diagrams, with explanations in panels where appropriate. These features make them easier to comprehend and more appealing.

- Starred sections and boxes for more advanced material (appearing with a grey background). These can be omitted without interrupting the flow of the argument. This allows the book to be used by students with different abilities and experience, and on courses of different levels of difficulty.

- 'Looking at the maths' sections. These short sections express a topic mathematically. Some use calculus; some

do not. They are designed to be used on more quantitatively focused courses and go further than other textbooks at introductory level in meeting the needs of students on such courses. Most refer students to worked examples in Maths Cases on the student website. Some of these use simultaneous equations; some use simple unconstrained optimisation techniques; others use constrained optimisation, using both substitution and Lagrange multipliers. The 'Looking at the maths' sections are short and can be omitted by students on non-mathematical courses without any loss of continuity.

- An open learning approach, with questions incorporated into the text so as to test and reinforce students' understanding as they progress. This makes learning a much more active process.
- End-of-chapter questions. These can be set as work for students to do in class or at home. Alternatively, students can simply use them to check their comprehension at the end of a topic.
- Summaries given at the end of each section, thus providing a point for reflection and checking on comprehension at reasonably frequent intervals.
- An even micro/macro split.
- The book is divided into seven parts. This makes the structure transparent and makes it easier for the student to navigate.

Despite retaining these popular features, there have been many changes to this eleventh edition.

Extensive revision

Economics (11th edition) uses a lot of applied material, both to illustrate theory and policy, and to bring the subject alive for students by relating it to contemporary issues. This has meant that, as with the previous edition, much of the book has had to be rewritten to reflect contemporary issues. Specifically this means that:

- Many new boxes have been included on topical and controversial issues, including the market for vaccines, the economics of two-sided markets, social media influencers, cash versus vouchers, evidence of Giffen behaviour in China, minimum unit pricing for alcohol, the secondary ticket market and takeovers, immigration and the labour market, minimum wage legislation, the roll out of Universal Credit in the UK, worker motivation and behavioural economics, the effects of consumer behaviour on firms' pricing, the dominance of Google and recent competition law cases, supermarket buying power, personalised pricing in digital markets, an analysis of the Dasgupta report on the economics of biodiversity, cap-and-trade and carbon emission taxes, measuring wellbeing, developments of HDI adjusted for inequality

and planetary pressures, COVID-19 and public-sector spending, measuring fiscal impulses, labour productivity and measuring inflation bias. Existing boxes have been extensively revised.
- There are many new examples given in the text.
- Theoretical coverage has been strengthened at various points in the book to reflect developments in the subject. This includes:
  – further emphasis on the role of borrowing, debt, financial markets, balance sheets and risk at the government, corporate and household levels with reference in many places to the impact of the COVID-19 pandemic;
  – inclusion of the role of various amplifiers in macroeconomic models;
  – the further development of macroeconomic models, including the interaction between the *IS/MP* model, the *DAD/DAS* model and the expectations-augmented Phillips curve models;
  – reworking the Solow model in terms of output per worker;
  – increased emphasis on behavioural economics at the level of both the consumer and the firm, including extending the analysis of bounded rationality, framing, present bias, loss aversion, prospect theory, preferences for fairness and biases when making decisions in an uncertain environment;
  – a deepening of the exposition of game theory at various points in the book and more detailed analysis of price discrimination, externalities and public goods.
- The text provides extensive coverage of the recent developments in money and banking and their impact on the economy.
- All policy sections reflect the changes that have taken place since the last edition, including changes to the regulation of businesses and the protection of the environment, and the responses to the financial crisis and COVID-19 pandemic, which had implications for the scale and scope of interventions and the financial well-being of governments. The text enables students to see how they can apply fundamental economic concepts to gain a better understanding of these important issues. Hence, students will be in a better position to analyse the actual responses of policy makers as well as the alternatives that could perhaps have been pursued.
- For this eleventh edition, all tables and charts have been updated, as have factual references in the text.
- Most importantly, every single section and every single sentence of the book has been carefully considered, and if necessary redrafted, to ensure both maximum clarity and contemporary relevance. The result, we hope, is a text that your students will find exciting and relevant to today's world.

SUGGESTIONS FOR SHORTER OR LESS ADVANCED COURSES

The book is designed to be used on a number of different types of course. Because of its comprehensive nature, the inclusion of a lot of optional material and the self-contained nature of many of the chapters and sections, it can be used very flexibly.

It is suitable for one-year principles courses at first-year degree level, two-year economics courses on non-economics degrees, A level, HND and professional courses. It is also highly suitable for single-semester courses, either with a micro or a macro focus, or giving a broad outline of the subject.

The following suggests chapters which are appropriate to different types of course and gives some guidance on chapters that can be omitted while retaining continuity:

Alternative 1: Less advanced but comprehensive courses

Omit all starred sections, starred sub-sections and starred boxes.

Example of a comprehensive course, omitting some of these chapters: Chapters 1–8, 10, 12–14, 15, 17–22, 24–25.

Alternative 2: Economics for Business courses

Chapters 1–3, 5–9, 12–15, 18, 21, 23–6.

Example of an Economics for Business course, omitting some of these chapters: Chapters 1–3, 6–10, 14, 15, 18, 22, 24–25.

Alternative 3: Introduction to microeconomics

Chapters 1–14, 24. The level of difficulty can be varied by including or omitting starred sections and boxes from these chapters.

Example of an Introduction to Microeconomics course, omitting some of these chapters: Chapters 1–4, 6–8, 10, 12, 24.

Alternative 4: Introduction to macroeconomics

Chapters 1, 2, 15–26. The level of difficulty can be varied by including or omitting starred sections and boxes from these chapters.

Example of an Introduction to Macroeconomics course, omitting some of these chapters: Chapters 1, 2, (if microeconomics has not previously been covered) 15, 17–23, 25.

Alternative 5: Outline courses

Chapters 1, 2, 6, 7, 15, 17, 18, 22, 24, 25 (section 25.1). Omit boxes at will.

Alternative 6: Courses with a theory bias

Chapters 1, 2, 4–10, 12, 15–21, 23, 24, 25. The level of difficulty can be varied by including or omitting starred sections and boxes from these chapters.

Alternative 7: Courses with a policy bias (and only basic theory)

Chapters 1–3, 6, 7, 11–15, (17), 22–6.

COMPANION RESOURCES

MyEconLab (for students)

MyEconLab is a comprehensive set of online resources developed for the eleventh edition of *Economics*. The book is available with an access card, but if your book did not come with one, you can purchase access to the resources online at www.MyEconLab.com.

MyEconLab provides a variety of tools to enable students to assess their own learning, including exercises, quizzes and tests, arranged chapter by chapter. There are many new questions in this edition and each question has been carefully considered to reflect the learning objectives of the chapter. A personalised Study Plan identifies areas to concentrate on to improve grades, and specific tools are provided to each student to direct their studies in the most efficient way.

Student website

In addition to the materials on MyEconLab, there is an open-access companion website for students with a large range of other resources, including:

- Animations of key models with audio explanations. These can be watched online or downloaded to a computer, MP4 player, smart phone, etc.;
- Links to the Sloman Economics news blog with news items added several times each month by a small team of authors;
- 224 case studies with questions for self-study and a range of activities for individual students or groups. These case studies are ordered chapter by chapter and referred to in the text;

- Maths cases with exercises, related to the 'Looking at the Maths' sections in the book;
- Updated list of 284 hotlinks to sites of use for economics;
- Answers to all in-chapter questions.

Note that the companion website, news blog and hotlinks can also be accessed directly from **go.pearson.com/uk/sloman**.

See the Student Resources chart on page xxi.

MyEconLab (for lecturers)

You can register online at www.myeconlab.com to use MyEconLab, which is a complete virtual learning environment for your course or embedded into Blackboard, WebCT or Moodle. You can customise its look and feel and its availability to students. You can use it to provide support to your students in the following ways:

- MyEconLab's gradebook automatically records each student's time spent and performance on the tests and Study Plan. It also generates reports you can use to monitor your students' progress.
- You can use MyEconLab to build your own tests, quizzes and homework assignments from the question base provided to set for your students' assessment.
- Questions are generated algorithmically so that they use different values each time they are used.
- You can create your own exercises by using the econ exercise builder.

Additional resources for lecturers

There are also many additional resources for lecturers and tutors that can be downloaded from the lecturer section of MyEconLab or from the separate lecturer website. These have been thoroughly revised for this updated eleventh edition. These include:

- PowerPoint® slideshows in full colour for use with a data projector in lectures and classes. These can also be made available to students by loading them on to a local network. There are several types of these slideshows:
  - All figures from the book and most of the tables. Each figure is built up in a logical sequence, thereby allowing them to be shown in lectures in an animated form. They are also available in a simple version suitable for printing for handouts or display on an OHP or visualiser.
  - A range of models. There are 42 files, each containing one of the key models from the book, developed in an animated sequence of between 20 and 80 screens.
  - Customisable lecture slideshows. There is one for each chapter of the book. Each one can be easily

edited, with points added, deleted or moved, so as to suit particular lectures. A consistent use of colour is made to show how the points tie together. It is not intended that all the material is covered in a single lecture; you can break at any point. It's just convenient to organise them by chapter. They come in various versions:

  - o Lecture slideshows with integrated diagrams. These include animated diagrams, charts and tables at the appropriate points.
  - o Lecture slideshows with integrated diagrams and questions. These include multiple-choice questions to allow lectures to become more interactive and can be used with or without an audience response system (ARS). An ARS version is available for TurningPoint® and is ready to use with the appropriate 'clickers' or on smartphones, tablets or laptops through the TurningPoint app (previously called ResponseWare®). The 'Show of Hands' version can easily be adapted for use with other ARS software.
  - o Lecture plans without the diagrams. These allow you to construct your own diagrams on the blackboard, whiteboard or visualiser.
- Answers to all questions in *Economics* (11th edition): i.e. questions embedded in the text, box questions and end-of-chapter questions. These can be edited as desired and distributed to students.
- Answers to the case studies and maths cases found on the student website.
- Case studies. These 224 cases, also available to students on the student website, can be reproduced and used for classroom exercises or for student assignments. Most cases have questions, to which answers are also provided (not available to students). Each case also has an activity for individual students or for groups, and most would be suitable for seminars.
- Maths cases. These 33 maths cases with exercises, also available to students on the student website, relate to the 'Looking at the Maths' sections in the book. Answers to the exercises are also provided (not available to students).
- Workshops. There are 20 of these (10 micro and 10 macro/international). They are in Word® and can be reproduced for use with large groups of students (up to 200). They can also be amended to suit your course. Suggestions for use are given in an accompanying file. Answers to all workshop questions are given in separate Word® files.
- Teaching/learning case studies. These 20 case studies examine various ways to improve student learning of introductory economics. They have been completely revised with new hyperlinks where appropriate.

The following two pages show in diagrammatic form all the student and lecturer resources.

Student Resources

- **Student website (open access)**
  - **News blog site**
    - Podcasts on topical news items
    - Hotlinks to 284 sites
    - Current news articles with questions
    - News archive searchable by chap or month
  - **Chapter resources**
    - Animated models with audio
    - Answers to in-text questions
    - Maths case studies
    - Links to news articles by chapter
    - Over 220 case studies
    - Hotlinks to news and data sources

- **MyEconLab (access using pincode in book)**
  - **Homework quizzes and tests**
    - Calendar for homework and tests
    - Practice and assigned tests
      - Results
    - Study plan (exercises)
    - Assigned homework
      - Results
  - **Other resources for book**
    - Grapher
    - Ebook to view any chapter online
    - MyEconLab Help
    - Glossary and glossary flashcards
    - Single player experiments
    - Hotlinks to sites listed in Appendix 2

Lecturer Resources

Word files

- **Student case studies**
  - **Maths cases**
    - Answers to maths cases questions
  - **Case studies**
    - Answers to case study questions
- **Teaching/ learning case studies**
- **Workshops (20)**
  - Answers to workshops
- **Answers to questions in book**
  - In-text questions
  - End-of-chapter questions
  - Box questions

PowerPoint files

- **Lecture plans**
  - Non-animated for OHTs or printing
  - Animated in full colour for projection
    - Without questions
    - With questions
      - Plain (for show of hands, etc.)
      - Audience response system
        - TurningPoint version for clickers, phones, etc.
- **Models (animated)**
- **Figures and tables**
  - Non-animated for OHTs or printing
  - Animated in full colour for projection

Acknowledgements

Introduction

This opening part of the book introduces you to economics – what it is and why it is a great subject to study. Economics is not a set of facts or theories to be memorised; it is both more interesting and more useful than that. Studying economics enables you to think about the world in a different way; it helps you to make sense of the decisions people make: decisions about what to buy or what job to do; decisions governments make about how much to tax or what to spend those taxes on; decisions businesses make about what to produce, what prices to charge and what wages to pay. This makes economics relevant for everyone, not only those who are going on to further study.

And it is about some of the biggest issues that face society, such as poverty and inequality, health and wellbeing, the environment, biodiversity and sustainability, the relationships between nations and how we trade and how money gets moved around the world, economic recessions and unemployment, and how individuals and governments can help to tackle these issues.

By studying economics, you will gain a 'toolkit' of concepts, ideas and theories that will enable you to think about and analyse these issues. You will be able to apply this 'way of thinking' to your life both now and in the future. You will be able to think more analytically and to problem-solve more effectively; this helps explain why economics graduates are so highly valued by employers. Studying economics therefore opens up a variety of career opportunities.

Economics and Economies

We start by looking at two of the biggest issues of our time – the COVID-19 pandemic and global warming. These have had profound effects on societies around the world and, in the case of global warming, will do for decades to come. But they are not just issues studied by health and climate scientists. They are forcing us and our governments to make choices. Studying these choices is central to economics. Economists can analyse them and present us with policy alternatives. They can help us come to the best decisions in the light of the information presented by scientists.

Economics contains some core ideas. These ideas are simple, but can be applied to a wide range of economic problems. We start examining these ideas in this chapter. We begin on the journey to help you to 'think like an economist' – a journey that we hope you will find fascinating and will give you a sound foundation for many possible future careers.

In this chapter, we will attempt to answer the question, 'What is economics about?', and give you greater insight into the subject you are studying. We will see how the subject is divided up and distinguish between the two major branches of economics: microeconomics and macroeconomics.

We will also look at the ways in which different types of economy operate, from the centrally planned economies of the former communist countries to the more free-market economies of most of the world today. We will ask just how 'markets' work.

1.1 ECONOMICS AND GLOBAL ISSUES

Economists study very many of the issues we face, whether as individuals, families, firms and employees, local groups, societies, central and local government, and internationally through institutions and meetings of governments. Some of these issues are small everyday ones, such as what to buy in the supermarket or how much to save. Others are global in scale, requiring solutions at a whole range of levels from the international to actions by individuals.

Two of the greatest issues to confront society in recent times have been the coronavirus pandemic and the climate crisis.

As COVID-19 swept across the world in early 2020, it left a trail of deaths and lost livelihoods in its wake. Everyone had to adjust their way of living, faced with lockdowns, working from home, or jobs lost or furloughed. As scientists rushed to develop vaccines and health authorities rushed to distribute them, so governments were faced with the seeming dilemma of how much to prioritise saving lives versus how much to prioritise saving livelihoods through keeping the economy going. Or would prioritising saving lives and locking down allow the economy to bounce back more quickly later on with the virus sooner under control?

The other issue is the climate emergency, with scientific evidence becoming clearer of the devasting effect of global warming. Melting ice caps causing rising sea levels that devastate low-lying lands; a change in long-term rainfall totals, with some areas becoming drier and others wetter, affecting long-term crop yields and livelihoods and forcing people to migrate to survive; more frequent droughts, fires, floods and hurricanes causing death and destruction; a loss of biodiversity as species are wiped out and as humans take more desperate steps to survive, such as cutting down forests and farming more intensively – activities that compound environmental damage.

We examine each of these two issues and see how economists can contribute to understanding them and their consequences and what can be done about them. As we shall see, economists have played a major part and will continue to do so.

COVID-19 and the global health emergency

The COVID-19 pandemic dominated our lives during 2020 and 2021 and beyond. People and governments struggled to cope with illness and death, and the damage to lives and livelihoods. The impact on developing countries was particularly harsh. According to the World Bank, in 2020 alone the pandemic may have pushed around 100 million people into extreme poverty.[1]

Everyone was faced with choices and these affected behaviour. Most of these had an economic dimension. Indeed, economics studies the choices we make as individuals, firms, societies or governments.

Individual choices

People had to decide whether to follow the rules and advice about behaviour (e.g. whether to wear a face mask or socially distance). Some decided to follow lockdowns; others were ready to break or bend the rules. Economics studies people's behaviour – and how it impacts on economic decisions and the economy. We look at such behaviour in Chapters 2 to 5. For example, early on in the pandemic, many people stockpiled various items, such as hand sanitiser, toilet rolls and dried foods. This caused many shops to run out, which only further encouraged panic buying. Some shops responded by raising prices to increase their profit margins.

The lockdowns affected firms' profits. Some sectors were particularly hard hit, such as hospitality, leisure and tourism. Many suppliers found that their sales revenues had dried up as they were forced to close down, while others adjusted by trying to sell more online. Firms had to choose whether to give up or carry on.

On the plus side, some of their costs had fallen, such as heating and lighting and staff costs; we call these 'variable costs'. Other costs, however, such as rent, rates and interest charges generally did not fall; we call these 'fixed costs'.

Profits would have become losses if the government had not provided substantial support, which was still not enough to prevent many firms going out of business. Some managed to defer fixed costs, but these would have to be paid later – another difficult choice whether or not to give up.

And the pandemic hastened the move to online sales and away from the High Street, leading to the demise of many large chains of shops such as Arcadia, Laura Ashley and Debenhams. Others, such as John Lewis, closed a number of branches. Across the UK, some 17 500 chain-store outlets were permanently closed in 2020. In contrast, sales of online retailers such as Boohoo and Asos boomed.

We examine costs, revenues and profits in Chapters 6 to 9. We see how some firms are better protected against market forces than others, especially if they have a large market share and resulting market power.

As far as employees were concerned, some were easily able to work from home with a separate room to work in and a good Internet connection. They also saved money on commuting costs. Others with childcare responsibilities and shared working spaces and/or devices struggled to work efficiently from home. Some found their incomes constant or even rising; others saw a fall or had to rely on furlough money from the government. Most had little power in such a situation and had to accept the wages determined by the changing market environment.

Then vaccines began to be rolled out. Most people embraced getting jabbed to protect them and their loved ones. Others were suspicious for various reasons. But here was

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a classic problem in economics: what we do for ourselves often has spillover effects on others. If we are not protected, we are more likely to catch the disease and pass it on to others, even if we only get infected mildly or are largely asymptomatic. Many actions we take affect others – either beneficially or adversely. These can be as simple as whether to wear a face mask. So should the government constrain our actions? This is another key choice that has to be made and economists can help analyse these choices and identify their costs and benefits.

Government choices

The pandemic did not just affect individuals and firms; it had major effects on whole economies. With many firms being forced to shut down, even if only temporarily, and some sectors, such as public transport, facing a collapse in demand, economies around the world went into recession – economic growth was negative.

The UK was particularly badly hit at first, partly from the choice made by the government to delay locking down. National output (known as 'gross domestic product' or 'GDP') fell by nearly 10 per cent in 2020. Unemployment rose. The government responded by massively increasing spending by supporting individuals through the furlough scheme, whereby 80 per cent of the wages of those temporarily laid off were covered by the government and distributed through their employers. Other support was given to businesses and to the self-employed. This prevented unemployment from rising much further.

Other longer-term measures for recovery included large-scale spending on physical infrastructure, such as public transport, roads, green energy and broadband, and on public services, such as health and education. In the USA, President Biden introduced a $3 trillion programme of infrastructure spending to boost a green recovery. This followed a $1.9 trillion programme of support for vulnerable people and businesses to survive the pandemic.

We look at issues such as growth and unemployment in the second half of the book from Chapter 15 onwards.

But the massive support came at a cost. Government spending on support schemes plus a decline in tax revenues meant that government borrowing soared. In the UK, annual public-sector net borrowing rose from 2.6 per cent of GDP in 2019 to nearly 17 per cent in 2020, so adding to the total stock of public-sector debt, pushing it up from 84.4 per cent in 2019 to just over 100 per cent in 2020 – and forecast to rise to nearly 110 per cent by 2023 (see Figure 22.3 on page 697).

The government has to finance the borrowing through paying interest from taxes (or even more borrowing). So the government was faced with a choice about when to start raising taxes or cutting government spending to reduce the level of borrowing. This was a hard choice and the plan, announced in the 2021/22 Budget, was to raise taxes on business profits ('corporation tax') and to freeze income tax thresholds from April 2023. Similar dilemmas were faced by governments around the world. The general approach was to

spend now and pay later – an easy choice at the time, but a difficult one later, especially for governments facing re-election. Policy choices such as these are examined in Chapter 22.

It was not just governments that were trying to keep their economies going. Central banks, such as the Federal Reserve in the USA, the European Central Bank for the eurozone and the Bank of England for the UK, were also playing their part. The general approach was to create more electronic money, through a process of 'quantitative easing'. If there was more money circulating through the banking system, people would borrow and spend more, helping to boost businesses.

But when you turn on the 'money tap' like this, you have to choose how much money to create and when to turn the tap off. Too little money and the recession may persist; too much money and prices may be pushed up by soaring spending. This 'inflation', as it is called, creates other problems for the economy, and central banks are keen not to let it go above 2 per cent per annum. The role of money in the economy is examined in Chapter 18 and subsequent chapters.

Give some other examples of choices that governments had to make during the pandemic. To what extent were they economic choices?

Getting all these economic choices right was a hard thing for individuals, businesses and governments. Economists had a crucial role in analysing the effects of these choices and advising on the best courses of action.

The environment and the global climate emergency

So can economists play a central role in addressing the climate emergency? The answer is 'yes' at many levels. Climate scientists can model the causes and effects of global warming. However, to address the problem and cut emissions to reach carbon neutrality and stop global warming – or at least limit it to 1.5°C above pre-industrial levels, which is the objective of the Intergovernmental Panel on Climate Change (IPCC) – then choices have to be made.

As we saw when looking at the coronavirus pandemic in the context of vaccination, people's actions affect others. Perhaps nowhere is this more crucial than with the environment. When people burn fossil fuels in their boilers or their cars, or buy goods which have travelled half way across the world on fossil-fuel hungry ships and planes, this affects others; not just themselves.

At an individual level, therefore, people need to think and behave 'green'. But what are the mechanisms for achieving this? Apart from education and developing greater social responsibility, pricing is key. If renewable energy were cheaper and fossil fuels were more expensive, then people would be more willing to switch to low-carbon

consumption. Indeed, pricing is a central issue in economics. We look at pricing in Chapters 2 and 3 and later in Chapters 7 and 8.

But how can prices be altered? They can be reduced by government subsidies and raised by taxes. We look at green taxes and subsidies in Chapters 12 and 13. There are other methods too by which pricing can be used. One of these is emissions trading. This is where permits to emit CO_2 are allocated or auctioned to businesses, which can then trade them in markets. Low emitters will not have to pay so much, thereby giving them a cost advantage over high emitting companies, which will require more permits and hence have to pay more. Economists have played a key role in developing emissions trading in markets such as the EU Emissions Trading Scheme (EU ETS).

The issue of fairness

One of the key issues in economics is how to achieve a fair distribution of income and wealth, both today and over time. One area where this is vitally important is the environment. How can the world fairly share the costs and benefits of creating a low-carbon economy? If it fails, politicians will face a backlash from people who see their jobs and incomes under threat. Young people will blame the old for taking more than their fair share and degrading the environment in the process.

The problem is that change normally involves gainers and losers – a central dilemma in economics. Green investment may create jobs in alternative energy generation but result in jobs being lost in coal mining and heavy industry. And when there are groups of losers, populist politicians can use the resulting anger to drive wedges in society and turn people against tackling climate change – something that is easier if they can deny its existence.

International action

We live in an interdependent world. Actions in one part of the globe affect lives in others. If the rich countries are big carbon emitters, this affects people in poor countries too. Their lives may be more vulnerable to climate change and its impact on the weather and harvests. Economists play a large role in studying the trading between nations and how economic power affects patterns of trade and investment.

Multinational companies often drive intensive farming and mining in developing countries, and the effects on the environment in these countries can be devastating. Rainforests are cut down for mining, ranching or growing monocrops, such as palm oil plantations. And not only is the devastation confined to these countries: as well as hugely diminishing biodiversity, they contribute to global warming as the 'lungs of the world' are destroyed. From 2010 to 2019, in Brazil's Amazon basin 16.6 billion tonnes of CO_2 were released into the atmosphere from burning or destroying forest, or replacing it with plantations. Yet only 13.9 billion tonnes were drawn down through photosynthesis and new growth.[2]

Actions by the global community can help but very often there are international games being played, with countries often unwilling to commit to carbon-reducing measures unless they can be convinced that other countries are playing their part too. Economists study these types of 'games'. Indeed there is a major branch of economics called 'game theory', which looks at effective ways of incentivising people, firms and governments to behave in co-operative ways.

2 Xiangming Xiao et al., 'Carbon loss from forest degradation exceeds that from deforestation in the Brazilian Amazon', *Nature Climate Change* (29 April 2021), www.nature.com/articles/s41558-021-01026-5

> **BOX 1.1**   **WHAT'S THE LATEST ECONOMICS NEWS?**   CASE STUDIES AND APPLICATIONS
>
> - The UK cannot retain the benefits of the EU's single market or customs union now it has left the EU.
> - Researchers suggest that the long-term economic effects from the COVID-19 pandemic may be less serious than those from the financial crisis of 2007–8.
> - Severe droughts cause crops to fail across sub-Saharan Africa: higher grain prices expected soon.
> - There is concern that American trade policies will hurt both US consumers and producers, while reducing global growth.
> - Unemployment falls and economic growth accelerates, leading to expectations of higher interest rates.
> - The age at which UK workers can draw their state pension is raised further. Many predict that those currently under 30 will be working until at least the age of 70.
>
> - Lack of training helps to explain low levels of productivity.
> - Oil prices set to remain low for many years as more and more countries engage in fracking and as more investment takes place in green energy.
> - The economy grows more rapidly and economists predict that interest rates will rise; house prices likely to stop rising.
> - Government raises taxes to tackle soaring public-sector debt.
>
> 1. *What is it that makes each one of the above news items an economics item (we explore this question in the next section)?*
> 2. *In each case identify two different individuals or groups who might be affected by the news item.*

For what reasons may governments want other governments to stick to tough climate or emissions targets and yet be not willing to do so themselves?

Trade can make everyone better off. Countries can specialise in what they are good at and export these products, and then import products in which they are less efficient. But this only works if certain conditions hold, including recognition of the environmental impact of trade. Economists study these conditions and can advise governments on trade policy. This and other international issues are the subject of the final three chapters of the book.

All these economic issues stem from a core set of problems. It is to this core that we now turn.

1.2   THE CORE OF ECONOMICS

Many people think that economics is about *money*. Well, to some extent this is true. Economics has a lot to do with money: with how much money people earn; how much they spend; what various items cost; how much money firms make; the total amount of money there is in the economy. But, as we shall see later in the book, money is only important because of what it allows us to do; money is a tool and economics is more than just the study of money.

It is concerned with the following:

- The *production* of goods and services: how much an economy produces, both in total and of individual items; how much each firm or person produces; what techniques of production are used; how many people are employed.
- The *consumption* of goods and services: how much people spend (and how much they save); how much people buy of particular items; what individuals choose to buy; how consumption is affected by prices, advertising, fashion, people's incomes and other factors.

Could production and consumption take place without money? If you think they could, give some examples.

But we still have not got to the bottom of what economics is about. Is there one crucial ingredient that makes a problem an economic one? The answer is that there is a central problem faced by all individuals and all countries, no matter how rich. It is the problem of *scarcity* – an issue underlying all other economic problems. For an economist, scarcity has a very specific definition.

Before reading on, how would you define 'scarcity'? Must goods be at least temporarily unattainable to be scarce?

The problem of scarcity

Ask people if they would like more money, and the vast majority would answer 'Yes'. But they don't want more money for its own sake. Rather they want to be able to buy more goods and services, either today or in the future. These 'wants' will vary according to income levels and tastes.

In a poor country 'wants' might include clean water, education and suitable housing. In richer nations 'wants' might involve a second car, longer holidays and more time with friends and family. As countries get richer, human wants may change but they don't disappear. Wants are virtually unlimited.

Yet the means of fulfilling wants are limited. At any point, the world can only produce a finite amount of goods and services because the world has a limited amount of *resources*. These resources, or *factors of production* as they are often called in economics, are of three broad types:

- Human resources: *labour*. The labour force is limited in number, but also in skills. This limits the productivity of labour: i.e. the amount labour can produce.
- Natural resources: *land and raw materials*. The world's land area is limited, as are its raw materials.
- Manufactured resources: *capital*. Capital consists of all those inputs that have themselves had to be produced. The world has a limited stock of factories, machines, transportation and other equipment. The productivity of this capital is limited by the current state of technology.

Definitions

Production The transformation of inputs into outputs by firms in order to earn profit (or to meet some other objective).

Consumption The act of using goods and services to satisfy wants. This will normally involve purchasing the goods and services.

Factors of production (or resources) The inputs into the production of goods and services: labour, land and raw materials, and capital.

Labour All forms of human input, both physical and mental, into current production.

Land and raw materials Inputs into production that are provided by nature: e.g. unimproved land and mineral deposits in the ground.

Capital All inputs into production that have themselves been produced: e.g. factories, machines and tools.

? *Could each of these types of resources be increased in quantity or quality? Is there a time dimension to your answer?*

So this is the fundamental economic problem: human wants are virtually unlimited, whereas the resources available to meet those wants are limited. We can thus define scarcity as follows:

> **KEY IDEA 1**
>
> **Scarcity** is the excess of human wants over what can actually be produced. Because of scarcity, various choices have to be made between alternatives.

? *If we would all like more money, why does the government not print a lot more? Could it not thereby solve the problem of scarcity 'at a stroke'?*

Of course, we do not all face the problem of scarcity to the same degree. A poor family who may not be able to afford enough to eat, or a decent place to live, will hardly see it as a 'problem' that a rich family cannot afford a second skiing holiday. But economists do not claim that we all face an equal problem of scarcity. In fact this is one of the major issues economists study: how resources are distributed, whether between different individuals, different regions of a country or different countries of the world.

This economic problem – limited resources but limitless wants – makes people, both rich and poor, behave in certain ways. Economics studies that behaviour. It studies people at work, producing goods that people want. It studies people as consumers, buying the goods that they want. It studies governments influencing the level and pattern of production and consumption. It even studies why people get married and what determines the number of children they have! In short, it studies anything to do with the process of satisfying human wants.

Demand and supply

We have said that economics is concerned with consumption and production. Another way of looking at this is in terms of *demand* and *supply*. Demand and supply and the relationship between them lie at the very centre of economics. How does this relate to the problem of scarcity?

Demand is related to wants. If every good and service were free, people would simply demand whatever they wanted. In total, such wants are likely to be virtually boundless, perhaps only limited by people's imaginations. *Supply*, on the other hand, is limited. It is related to resources. The amount that firms can supply depends on the resources and technology available.

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Given the problem of scarcity – that human wants exceed what can actually be produced – *potential* demands will exceed *potential* supplies. Society has to find some way of dealing with this problem, to try to match demand with supply. This applies at the level of the economy overall: total or 'aggregate' demand needs to be balanced against total or *aggregate* supply. In other words, total spending in the economy should balance total production. It also applies at the level of individual goods and services. The demand and supply of cabbages should balance, and so should the demand and supply of cars, houses, tablets and holidays.

But if potential demand exceeds potential supply, how are *actual* demand and supply made equal? Either demand has to be reduced, or supply has to be increased, or a combination of the two. Economics studies this process. It studies how demand adjusts to available supplies, and how supply adjusts to consumer demands.

Dividing up the subject

Economics is traditionally divided into two main branches – *macroeconomics* and *microeconomics*, where 'macro' means big and 'micro' means small.

Macroeconomics is concerned with the economy as a whole. It is concerned with **aggregate demand** and **aggregate supply**. By 'aggregate demand' we mean the total amount of spending in the economy, whether by consumers, by customers outside the country for our exports, by the government, or by firms when they buy capital equipment or stock up on raw materials. By 'aggregate supply' we mean the total national output of goods and services.

Microeconomics is concerned with the individual parts of the economy. It is concerned with the demand and supply of particular goods, services and resources such as cars, butter, clothes, haircuts, plumbers, accountants, blast furnaces, computers and oil.

> ## Definitions
>
> **Scarcity** The excess of human wants over what can actually be produced to fulfil these wants.
>
> **Macroeconomics** The branch of economics that studies economic aggregates (grand totals): e.g. the overall level of prices, output and employment in the economy.
>
> **Aggregate demand** The total level of spending in the economy.
>
> **Aggregate supply** The total amount of output in the economy.
>
> **Microeconomics** The branch of economics that studies individual units: e.g. households, firms and industries. It studies the interrelationships between these units in determining the pattern of production and distribution of goods and services.

? *Which of the following are macroeconomic issues, which are microeconomic ones and which could be either depending on the context?*
  (a) Inflation.
  (b) Low wages in certain sectors.
  (c) The rate of exchange between the pound and the euro.
  (d) Why the prices of fresh fruit and vegetables fluctuate more than those of cars.
  (e) The rate of economic growth this year compared with last year.
  (f) The decline of traditional manufacturing industries.
  (g) Immigration of workers.

Macroeconomics

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p7

Because scarcity exists, societies are concerned that their resources should be used *as fully as possible* and that over time their national output should grow.

Why should resources be used as fully as possible? If resources are 'saved' in one time period, surely they can be used in the next time period? The answer is that not all resources can be saved. For example, if a worker doesn't go to work one week then that resource is lost: labour can't be saved up for the future.

Why do societies want growth? To understand this, think back to the discussion of endless wants: if our output grows, then more of our wants can be satisfied. Individuals and society can be made better off.

The achievement of growth and the full use of resources are not easy. This is demonstrated by periods of high unemployment and stagnation that have occurred from time to time throughout the world (for example, in the recessions of the 1930s, the early 1980s and following the financial crisis of 2007–8 and COVID-19 pandemic of 2020). Furthermore, attempts by governments to stimulate growth and employment can result in inflation and rising imports. Economies have often experienced business cycles where periods of growth alternate with periods of recession, such periods varying from a few months to a few years.

Macroeconomic problems are closely related to the balance between aggregate demand and aggregate supply.

If aggregate demand is too *high* relative to aggregate supply, inflation and trade deficits are likely to result.

- **Inflation** refers to a general rise in the level of prices throughout the economy. If aggregate demand rises substantially, firms are likely to respond by raising their prices. If demand is high, they can probably still sell as much as before (if not more) even at the higher prices, and make higher profits. If firms in general put up their prices, inflation results. By comparing price levels between different periods we can measure the *rate of inflation*. Typically, the rate of inflation reported is the *annual* rate of inflation: the percentage increase in prices over a 12-month period.
- **Balance of trade** deficits are the excess of imports over exports. If aggregate demand rises, people are likely to

buy more imports. So part of the extra spending will go on goods from overseas, such as Japanese TVs, Chinese computers, German cars, etc. Also, if the rate of inflation is high, home-produced goods will become uncompetitive with foreign goods. We are likely to buy more foreign imports and people abroad are likely to buy fewer of our exports.

If aggregate demand is too low relative to aggregate supply, unemployment and recession may well result.

- **Recession** is where output in the economy declines for two successive quarters or longer. In other words, during this period growth becomes negative. Hence, not all periods during which the economy contracts are termed 'recessions'. It is the duration and persistence of the contraction that distinguishes a recession. Recessions are associated with low levels of consumer spending. If people spend less, shops are likely to find themselves with unsold stock. Then they will buy less from the manufacturers; they will cut down on production; and buy fewer capital goods such as machinery.
- **Unemployment** is likely to result from cutbacks in production. If firms are producing less, they will need to employ fewer people.

Macroeconomic policy, therefore, tends to focus on the balance of aggregate demand and aggregate supply. It can be **demand-side policy**, which seeks to influence the level of spending in the economy. This in turn will affect the level of production, prices and employment. Or it can be **supply-side policy**. This is designed to influence the level of production directly: for example, by trying to create more incentives for firms to innovate.

Definitions

Inflation A general rise in the level of prices throughout the economy.

(Annual) Rate of inflation The percentage increase in the level of prices over a 12-month period.

Balance of trade Exports of goods and services minus imports of goods and services. If exports exceed imports, there is a 'balance of trade surplus' (a positive figure). If imports exceed exports, there is a 'balance of trade deficit' (a negative figure).

Recession A period where national output falls for two or more successive quarters.

Unemployment The number of people of working age who are actively looking for work but are currently without a job. (Note that there is much debate as to who should officially be counted as unemployed.)

Demand-side policy Government policy designed to alter the level of aggregate demand, and thereby the level of output, employment and prices.

Supply-side policy Government policy that attempts to alter the level of aggregate supply directly.

BOX 1.2   LOOKING AT MACROECONOMIC DATA

CASE STUDIES AND APPLICATIONS

Assessing different countries' macroeconomic performance

Rapid economic growth, low unemployment, low inflation and the avoidance of current account deficits[1] are major macroeconomic policy objectives of most governments around the world. To help them achieve these objectives they employ economic advisers. But when we look at the performance of various economies, the success of governments' macroeconomic policies seems decidedly 'mixed'.

The table shows data for the USA, Japan, Germany[2] and the UK from 1961 to 2022.

Macroeconomic performance of four industrialised economies (average annual figures)

	Unemployment (% of workforce)				Inflation (annual %)				Economic growth (annual %)				Balance on current account (% of national income)			
	USA	Japan	Germany	UK	USA	Japan	Germany	UK	USA	Japan	Germany	UK	USA	Japan	Germany	UK
1961–70	4.8	1.3	0.6	1.7	2.4	5.6	2.7	3.9	4.2	10.1	4.4	3.0	0.5	0.6	0.7	0.2
1971–80	6.4	1.8	2.2	3.8	7.0	8.8	5.1	13.2	3.2	4.4	2.8	2.0	0.9	0.5	1.1	−0.7
1981–90	2.5	2.5	6.0	9.6	4.5	2.2	2.5	6.2	3.2	3.9	2.3	2.6	−1.7	2.3	2.6	−1.4
1991–2000	3.3	3.3	7.9	7.9	2.2	0.4	2.3	3.3	3.3	1.5	1.9	2.4	−1.6	2.5	−0.7	−1.5
2001–07	5.3	4.6	9.2	5.2	2.8	−0.1	1.9	1.9	2.1	1.0	2.3	2.5	−4.8	3.3	3.8	−2.1
2008–11	8.4	4.7	7.0	7.3	2.1	−0.2	1.6	3.4	0.4	−0.6	0.8	−0.3	−3.2	2.9	5.9	−3.3
2012–19	5.5	3.3	4.3	5.5	1.6	0.7	1.3	1.8	2.4	1.1	1.4	1.9	−2.2	2.6	7.5	−4.3
2020	8.1	2.8	4.2	4.5	1.2	0.0	0.4	0.9	−3.5	−4.8	−4.9	−9.9	−3.1	3.3	7.1	−3.9
2021–22	5.0	2.6	4.1	6.1	2.3	0.4	1.7	1.7	5.0	2.9	3.5	5.2	−3.5	3.4	7.3	−3.9

Note: Years 2021 and 2022 are based on forecasts.
Sources: *Statistical Annex of the European Economy* (Commission of the European Communities, various tables and years) and *World Economic Outlook* (IMF, April 2021), www.imf.org/en/Publications/WEO/weo-database/2021/April

1. *Has the UK generally fared better or worse than the other three countries?*
2. *Was there a common pattern in the macroeconomic performance of each of the four countries over these 60 years?*

If the government does not have much success in managing the economy, it could be for the following reasons:

■ Economists have incorrectly analysed the problems and hence have given the wrong advice.
■ Economists disagree and hence have given conflicting advice.
■ Economists have based their advice on inaccurate statistics or incorrect forecasts.
■ Governments have not listened to the advice of economists. This could be for political reasons, such as the electoral cycle.
■ There is little else that governments could have done: the problems were insoluble or could not have been predicted.

1 The current account balance is the trade balance plus any incomes earned from abroad minus any incomes paid abroad. These incomes could be wages, investment incomes or government revenues (see section 15.7 for details).
2 West Germany from 1961 to 1991.

Microeconomics

Microeconomics and choice

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p7

Because resources are scarce, choices have to be made. There are three main categories of choice that must be made in any society:

■ *What* goods and services are going to be produced and in what quantities, since there are not enough resources to produce everything people want? How many electric cars, how much coffee, how much healthcare, how many smartphones, etc. will be produced?
■ *How* are things going to be produced? What resources are going to be used and in what quantities? What techniques of production are going to be adopted? Will cars be produced by robots or by assembly-line workers? Will electricity be produced from coal, oil, gas, nuclear fission, renewable resources such as wind farms or a mixture of these?
■ *For whom* are things going to be produced? In other words, how will the country's income be distributed? After all, the higher your income, the more you can consume of the total output. What will be the wages of shop workers, MPs, footballers and accountants? How much will pensioners receive? How much of the country's income will go to shareholders or landowners?

All societies have to make these choices, whether they are made by individuals, groups or the government. They can be seen as microeconomic choices, since they are concerned not with the total amount of national output, but with the individual goods and services that make it up: what they are, how they are made, and who gets to consume them.

Choice and opportunity cost

Choice involves sacrifice. The more food you choose to buy, the less money you will have to spend on other goods. The more food a nation produces, the fewer resources there will be for producing other goods. In other words, the production or consumption of one thing involves the sacrifice of alternatives. This sacrifice of alternatives in the production (or consumption) of a good is known as its **opportunity cost**.

If the workers on a farm can produce either 1000 tonnes of wheat or 2000 tonnes of barley, then the opportunity cost of producing 1 tonne of wheat is the 2 tonnes of barley forgone. The opportunity cost of buying a textbook is the new pair of jeans that you have had to go without. The opportunity cost of saving for your old age is the consumption you sacrifice while younger.

Opportunity cost as the basis for choice is the first of our 'threshold concepts'. There are 15 of these threshold

KEY IDEA 2 The *opportunity cost* of any activity is the sacrifice made to do it. It is the best thing that could have been done as an alternative.

concepts, which we shall be exploring throughout the book. Once you have grasped these concepts and seen their significance, they will affect the way that you understand and analyse economic problems. They will help you to 'think like an economist'.

TC 1 p10

Definition

Opportunity cost The cost of any activity measured in terms of the best alternative forgone.

| THRESHOLD CONCEPT 1 | CHOICE AND OPPORTUNITY COST | THINKING LIKE AN ECONOMIST |

KI 1 p7

Scarcity, as we have seen, is at the heart of economics.

We all face scarcity. With a limited income we cannot buy everything we want. And even if we had the money, with only 24 hours in a day, we would not have time to enjoy all the things we would like to consume. The same applies at a national level. A country has limited resources and so cannot produce everything people would like. Of course, this is also true on a global scale: our planet has finite resources, and the technology and our abilities to exploit these resources are also limited.

With limited resources and endless wants, we have to make choices. In fact, virtually every time we do something, we are making a choice between alternatives. If you choose to watch television, you are choosing not to go out. If you buy a pair of trainers for £70, you are choosing not to spend that £70 on something else. Likewise, if a country devotes more of its resources to producing manufactured goods, there will be less to devote to the provision of services. If we devote more resources to producing a cleaner environment, we may have to produce less of the material goods that people want to consume.

What we give up in order to do something is known as its *opportunity cost*. Opportunity cost is the cost of doing something measured in terms of the best alternative forgone. It's what you would have chosen to do with your time or money if you had not made the choice you did. This is one of the most fundamental concepts in economics. It is a threshold concept: once you have seen its importance, it affects the way you look at economic problems. When you use the concept of opportunity cost, you are thinking like an economist. And this may be different from thinking like an accountant or from the way you thought before. It may sound deceptively simple, but in some

cases working out the opportunity cost of an activity can be a tricky process. We will come across this concept many times throughout this book.

By looking at opportunity cost we are recognising that we face trade-offs. To do more of one thing involves doing less of something else. For example, we trade off work and leisure. The more we work, the less leisure time we will have. In other words, the opportunity cost of working is the leisure we have sacrificed. Nations trade off producing one good against others. The more a country spends on defence, the less it will have to spend on consumer goods and services. This has become known as the 'guns versus butter' trade-off. In other words, if a country decides to use more of its resources for defence, the opportunity cost is the consumer goods sacrificed. We examine such trade-offs at a national level on pages 14–16, when we look at the 'production possibility curve'.

We therefore have to make decisions between alternatives. To make sensible decisions we must weigh up the benefits of doing something against its opportunity cost. This is known in economics as 'rational decision making'. It is another of our threshold concepts (no. 8): see page 109.

1. *Think of three things you did last week. What was the opportunity cost of each one?*
2. *Assume that a supermarket has some fish that has reached its sell-by date. It was originally priced at £10, but yesterday was marked down to £5 'for quick sale'. It is now the end of the day and it still has not been sold. The supermarket is about to close and there is no one in the store who wants fish. What is the opportunity cost for the store of throwing the fish away?*

Rational choices

Economists often refer to **rational choices**. This simply means that people are weighing up the *costs* and *benefits* of different activities and picking the option that allows them to maximise their objective. For consumers and workers this means making choices that maximise their happiness. For a firm it may mean choosing what and how much to produce to maximise profits.

Imagine you are doing your shopping in a supermarket and you want to buy a chicken. Do you spend a lot of money and buy a free-range organic chicken, or do you buy a cheap bird instead? To make a rational (i.e. sensible) decision, you will need to weigh up the costs and benefits of each alternative. The free-range chicken may taste better and it may meet your concerns about animal welfare, but it has a high opportunity cost: because it is expensive, you will need to sacrifice quite a lot of consumption of other goods if you decide to buy it. If you buy the intensively farmed chicken, however, although you will not enjoy it so much, you will have more money left over to buy other things: it has a lower opportunity cost.

Thus rational decision making, as far as consumers are concerned, involves choosing those items that give you the best value for money – i.e. the *greatest benefit relative to cost*.

The same principles apply to firms when deciding what to produce. For example, should a car firm open up another production line? A rational decision will again involve weighing up the benefits and costs. The benefits are the revenues the firm will earn from selling the extra cars. The costs will include the extra labour costs, raw material costs, costs of component parts, etc. It will be profitable to open up the new production line only if the revenues earned exceed the costs entailed: in other words, if it increases profits.

In the more complex situation of deciding which model of car to produce, or how many of each model, the firm must weigh up the relative benefits and costs of each – i.e. it will want to produce the most profitable product mix.

> **?** Assume that you are looking for a job and are offered two. One is more enjoyable, but pays less. How would you make a rational choice between the two jobs?

Marginal costs and benefits

In economics we argue that rational choices involve weighing up **marginal costs** and **marginal benefits**. These are the costs and benefits of doing a little bit more or a little bit less of a specific activity. They can be contrasted with the total costs and benefits of the activity.

Take a familiar example. What time will you set your alarm to go off tomorrow morning? Let us say that you have to leave home at 8:30. Perhaps you will set the alarm for 7:00. That will give you plenty of time to get ready, but it will mean less sleep. Perhaps you will decide to set it for 8:00. That will give you a longer lie-in, but more of a rush in the morning to get ready.

So how do you make a rational decision about when the alarm should go off? What you have to do is to weigh up the costs and benefits of *additional* sleep. Each extra minute in bed gives you more sleep (the marginal benefit), but means you'll be more rushed when you get up (the marginal cost). The decision is therefore based on the costs and benefits of *extra* sleep, not on the total costs and benefits of a whole night's sleep.

This same principle applies to rational decisions made by consumers, workers and firms. For example, the car firm we were considering just now will weigh up the marginal costs and benefits of producing cars: in other words, it will compare the costs and revenue of producing *additional* cars. If additional cars add more to the firm's revenue than to its costs, it will be profitable to produce them.

Rational decision making, then, involves weighing up the marginal benefit and marginal cost of any activity. If the marginal benefit exceeds the marginal cost, it is rational to do the activity (or to do more of it). If the marginal cost exceeds the marginal benefit, it is rational not to do it (or to do less of it).

Rational decision making is Threshold Concept 8 and this is examined in Chapter 4, page 109.

> **?** How would the principle of weighing up marginal costs and benefits apply to a worker deciding how much overtime to work in a given week?

Microeconomic objectives

Microeconomics is concerned with the allocation of scarce resources: with the answering of the *what, how* and *for whom* questions. But how satisfactorily will these questions be answered? Clearly this depends on society's objectives. There are two major objectives that we can identify: *efficiency* and *equity*.

Efficiency. If altering what was produced or how it was produced could make us all better off (or at least make some of us

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Definitions

Rational choices Choices that involve weighing up the benefit of any activity against its opportunity cost so that the decision maker successfully maximises their objective: i.e. happiness or profits.

Marginal costs The additional cost of doing a little bit more (or 1 unit more if a unit can be measured) of an activity.

Marginal benefits The additional benefits of doing a little bit more (or 1 unit more if a unit can be measured) of an activity.

Rational decision making Doing more of an activity if its marginal benefit exceeds its marginal cost and doing less if its marginal cost exceeds its marginal benefit.

better off without anyone losing), then it would be efficient to do so. For a society to achieve full *economic efficiency*, three conditions must be met:

- Efficiency in production (**productive efficiency**). This is where production of each item is at minimum cost. Producing any other way would cost more.
- Efficiency in consumption. This is where consumers allocate their expenditures so as to get maximum satisfaction from their income. Any other pattern of consumption would make people feel worse off.
- Efficiency in specialisation and exchange. This is where firms specialise in producing goods for sale to consumers, and where individuals specialise in doing jobs in order to buy goods, so that everyone maximises the benefits they achieve relative to the costs of achieving them.

These last two are collectively known as *allocative efficiency*. In any economic activity, allocative efficiency will be increased as long as doing more of that activity (and hence less of an alternative) involves a greater marginal benefit than marginal cost. Allocative efficiency will be achieved when all such improvements have been made.

Definitions

Economic efficiency A situation where each good is produced at the minimum cost and where individual people and firms get the maximum benefit from their resources.

Productive efficiency A situation where firms are producing the maximum output for a given amount of inputs, or producing a given output at the least cost.

Allocative efficiency A situation where the current combination of goods produced and sold gives the maximum satisfaction for each consumer at their current levels of income. Note that a redistribution of income would lead to a different combination of goods that was allocatively efficient.

BOX 1.3 THE OPPORTUNITY COSTS OF STUDYING

CASE STUDIES AND APPLICATIONS

What are you sacrificing?

You may not have realised it, but you probably consider opportunity costs many times a day. We are constantly making choices: what to buy, what to eat, what to wear, whether to go out, how much to study, and so on. Each time we make a choice to do something, we are in effect rejecting doing some alternative. This alternative forgone is the opportunity cost of the action we choose.

Sometimes the opportunity costs of our actions are the direct monetary costs we incur. Sometimes it is more complicated.

Take the opportunity costs of your choices as a student.

Buying a textbook costing £59.99

This choice does involve a direct money payment. What you have to consider are the alternatives you could have bought with the £59.99. You then have to weigh up the benefit from the best alternative against the benefit of the textbook.

1. *What might prevent you from making the best decision?*

Coming to lectures

Even though students now pay fees for their degrees in many countries, there is no extra (marginal) monetary cost in coming to classes once the fees have been paid. You will not get a refund by missing a lecture. The fees, once you've paid them, are what we call a 'sunk cost'.

So are the opportunity costs zero? No: by coming to a lecture you are not working in the library; you are not sleeping; you are not undertaking paid work during that time. If you are making a rational decision to come to classes, then you will consider such possible alternatives.

2. *If there are several other things you could have done, is the opportunity cost the sum of all of them?*

3. *What factors would make the opportunity cost of attending a class relatively high?*

Revising for an economics exam

Again, the opportunity cost is the best alternative to which you could have put your time. This might be revising for some other exam. You will probably want to divide your time sensibly between your subjects. A *sensible* decision is not to revise economics on any given occasion if you will gain a greater benefit from revising another subject. In such a case the (marginal) opportunity cost of revising economics exceeds the (marginal) benefit.

Choosing to study at university or college

What are the opportunity costs of being a student in higher education?

At first it might seem that the costs of higher education would include the following:

- Tuition fees.
- Books, stationery, etc.
- Accommodation, food, entertainment, travel and other living expenses.

But adding these up does not give the opportunity cost. The opportunity cost is the *sacrifice* entailed by going to university or college *rather than* doing something else. Let us assume that the alternative is to take a job that has been offered. The correct list of opportunity costs of higher education would include:

- Books, stationery, etc.
- Additional accommodation and travel expenses over what would have been incurred by taking the job.

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- Wages that would have been earned in the job, less any income received as a student.
- The tuition fees paid by the student.

?

4. *Why is the cost of food not included? Should the cost of clothing be included?*
5. *What impact would it have on the calculation of opportunity costs if you really disliked the nature of the work in the best alternative job?*

6. *Is the opportunity cost to the individual of attending higher education different from the opportunity costs to society as a whole? Do the benefits of higher education for society differ from those for the individual?*

Estimate your own cost of studying for a degree (or other qualification). For what reasons might you find it difficult to make such a calculation?

KEY IDEA 3

Economic efficiency is achieved when each good is produced at the minimum cost and where individual people and firms get the maximum benefit from their resources.

KEY IDEA 4

Equity is where income is distributed in a way that is considered to be fair or just. Note that an equitable distribution is not the same as an equal distribution and that different people have different views on what is equitable.

Equity. Even though the current levels of production and consumption might be efficient, they could be regarded as unfair, if some people are rich while others are poor. Another microeconomic goal, therefore, is that of **equity**. Income distribution is regarded as equitable if it is considered to be fair or just. The problem with this objective, however, is that people have different notions of fairness. A rich person may well favour a much higher degree of inequality than will a poor person. Likewise, socialist governments will generally be in favour of a greater redistribution of income from the rich to the poor than will conservative

governments. Equity is therefore described as a value judgement: notions of equity will depend on the values of individuals or society.

Definition

Equity A distribution of income that is considered to be fair or just. Note that an equitable distribution is not the same as an equal distribution and that different people have different views on what is equitable.

BOX 1.4   **SCARCITY AND ABUNDANCE**   CASE STUDIES AND APPLICATIONS

Is lunch ever free?

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The central economic problem is scarcity. But are *all* goods and services scarce? Is anything we desire truly abundant?

First, what do we mean by *abundance*? In the economic sense we mean something where supply exceeds demand at a *zero* price. In other words, even if it is free, there is no shortage. What is more, there must be no opportunity cost in supplying it. For example, if the government supplies health care free to the sick, it is still scarce in the economic sense because there is a cost to the government (and hence the taxpayer).

Two things that might seem to be abundant are air and water.

Air

In one sense air *is* abundant. There is no shortage of air to breathe for most people for most of the time. But if we define air as clean, unpolluted air, then in some parts of the world it is scarce. It costs money to clean polluted air. We may not pay directly – the cleaned-up air may be free to the 'consumer' – but the taxpayer or industry (and hence its customers) will have to pay.

Even if you live in a non-polluted part of the country, you may well have spent money moving there to escape the pollution. Again there is an opportunity cost to obtain the clean air.

Water

Whether water is abundant depends again on where you live. It also depends on what the water is used for.

Water for growing crops in a country with plentiful rain *is* abundant. In drier countries, resources have to be spent on irrigation. Water for drinking is not abundant. Reservoirs have to be built. The water has to be piped, purified and pumped.

?

1. *There is a saying in economics, 'There is no such thing as a free lunch' (hence the subtitle for this box). What does this mean?*
2. *Are any other (desirable) goods or services truly abundant?*

Can you think of any other (desirable) goods or services that are truly abundant? Discuss your ideas at a group level and see if you agree or disagree with any of the other suggestions.

Would it be desirable to have total equality in an economy, so that everyone receives the same share of resources?

The social implications of choice

In practice, the choices that people make may be neither efficient nor equitable. Firms may use inefficient techniques or be poorly managed; people often make wrong decisions about what to buy or what job to take; governments may be wasteful or inefficient in their use of tax revenues; there may be considerable inequality and injustice.

What is more, the effects of people's choices often spill over to other people. Take the case of pollution. It might be profitable for a firm to tip toxic waste into a river. But what is profitable for the firm will not necessarily be 'profitable' for society. Such an action may have serious environmental consequences.

Throughout the book we will be considering how well the economy meets various economic and social objectives, whether micro or macro. We will examine why problems occur and what can be done about them.

Illustrating economic issues: the production possibility curve

Economics books and articles frequently contain diagrams. The reason is that diagrams are very useful for illustrating economic relationships. Ideas and arguments that might take a long time to explain in words can often be expressed clearly and simply in a diagram.

Two of the most common types of diagram used in economics are graphs and flow diagrams. In this and the next section we will look at one example of each. These examples are chosen to illustrate the distinction between microeconomic and macroeconomic issues.

We start by having a look at a ***production possibility curve***. This diagram is a graph. Like many diagrams in economics it shows a simplified picture of reality – a picture stripped of all details that are unnecessary to illustrate the points being made. Of course, there are dangers in this.

In the attempt to make a diagram simple enough to understand, we run the risk of oversimplifying. If this is the case, the diagram may be misleading.

A production possibility curve is shown in Figure 1.1. The graph is based on the data shown in Table 1.1.

Assume that some imaginary nation devotes all its resources – land, labour and capital – to producing just two goods: food and clothing. Various possible combinations that could be produced over a given period of time (e.g. a year) are shown in the table. Thus the country, by devoting all its resources to producing food, could produce 8 million units of food but no clothing. Alternatively, by producing, say, 7 million units of food it could release enough resources – land, labour and capital – to produce 2.2 million units of clothing. At the other extreme, it could produce 7 million units of clothing with no resources at all being used to produce food.

> ### Definition
>
> **Production possibility curve** A curve showing all the possible combinations of two goods that a country can produce within a specified time period with all its resources fully and efficiently employed.

Figure 1.1   A production possibility curve
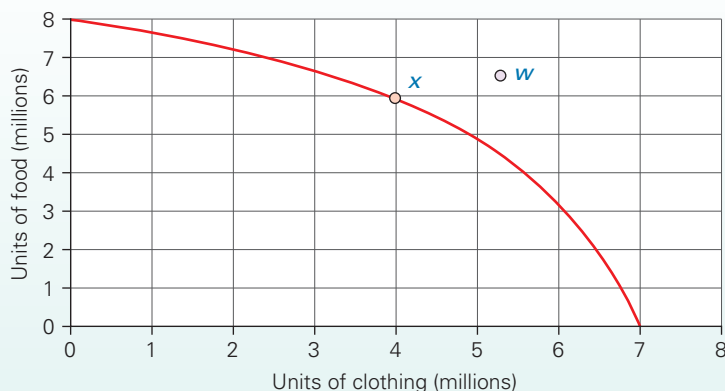
Table 1.1	Maximum possible combinations of food and clothing that can be produced in a given time period

Units of food (millions)	Units of clothing (millions)
8.0	0.0
7.0	2.2
6.0	4.0
5.0	5.0
4.0	5.6
3.0	6.0
2.0	6.4
1.0	6.7
0.0	7.0

The information in the table can be transferred to a graph (Figure 1.1). We measure units of food on one axis (in this case the vertical axis) and units of clothing on the other. The curve shows all the combinations of the two goods that can be produced with all the nation's resources fully and efficiently employed. For example, production could take place at point *x*, with 6 million units of food and 4 million units of clothing being produced. Production cannot take place beyond the curve. For example, production is not possible at point *w*: the nation does not have enough resources to do this.

Note that there are two simplifying assumptions in this diagram. First, it is assumed that there are just two types of good that can be produced. We have to assume this because we only have two axes on our graph. The other assumption is that there is only one type of food and one type of clothing. This is implied by measuring their output in particular units (e.g. tonnes). If food differed in type, it would be possible to produce a greater tonnage of food for a given amount of clothing simply by switching production from one foodstuff to another.

These two assumptions are obviously enormous simplifications when we consider the modern complex economies of the real world. But despite this, the diagram still allows important principles to be illustrated simply. In fact, this is one of the key advantages of using diagrams.

Microeconomics and the production possibility curve

A production possibility curve illustrates the microeconomic issues of choice and opportunity cost.

If the country chose to produce more clothing, it would have to sacrifice the production of some food. This sacrifice of food is the opportunity cost of the extra clothing.

The fact that to produce more of one good involves producing less of the other is illustrated by the downward-sloping nature of the curve. For example, the country could move from point *x* to point *y* in Figure 1.2. In doing so it would be producing an extra 1 million units of clothing, but 1 million units less of food. Thus the opportunity cost of the 1 million extra units of clothing would be the 1 million units of food forgone.

It also illustrates the phenomenon of *increasing opportunity costs*. By this we mean that as a country produces more of one good it has to sacrifice ever-increasing amounts of the other. The reason for this is that different factors of production have different properties. People have different skills; land varies across different parts of the country; raw materials differ one from another; and so on. Thus, as a country concentrates more on the production of one good, it has to start using resources that are less suitable – resources that would have been better suited to producing

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Definition

Increasing opportunity costs of production When additional production of one good involves ever-increasing sacrifices of another.

Figure 1.2	Increasing opportunity costs
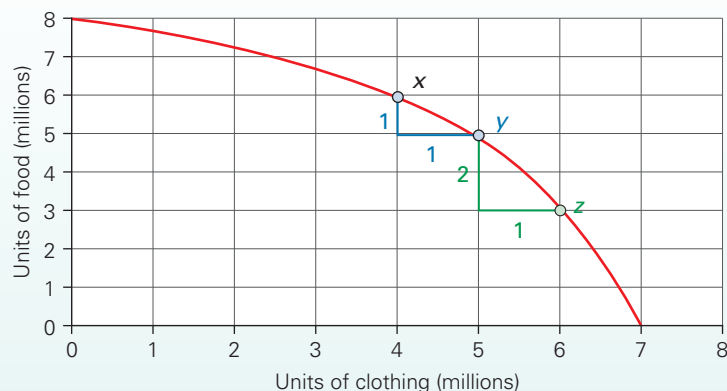
other goods. In our example, then, the production of more and more clothing will involve a growing *marginal cost*: ever-increasing amounts of food have to be sacrificed for each additional unit of clothing produced.

It is because opportunity costs increase that the production possibility curve is bowed outward rather than being a straight line. Thus in Figure 1.2, as production moves from point *x* to *y* to *z*, so the amount of food sacrificed rises for each additional unit of clothing produced. The opportunity cost of the fifth million units of clothing is 1 million units of food. The opportunity cost of the sixth million units of clothing is 2 million units of food.

?

1. *What is the opportunity cost of the seventh million units of clothing?*
2. *If the country moves upward along the curve and produces more food, does this also involve increasing opportunity costs?*
3. *Under what circumstances would the production possibility curve be (a) a straight line; (b) bowed in towards the origin? Are these circumstances ever likely?*

Macroeconomics and the production possibility curve

There is no guarantee that resources will be fully employed, or that they will be used in the most efficient way possible. The nation may thus be producing at a point inside the curve: for example, point *v* in Figure 1.3.

What we are saying here is that the economy is producing less of both goods than it is possible for it to produce, either because some resources are not being used (for example, workers may be unemployed), or because it is not using the most efficient methods of production possible, or a combination of the two. By using its resources to the full, the nation could move out onto the curve: to point *x* or *y*, for example. It could produce more clothing *and* more food.

Here we are concerned not with the combination of goods produced (a microeconomic issue), but with whether the total amount produced is as much as it could be (a macroeconomic issue).

Over time, the production possibilities of a nation are likely to increase. **Investment** in new plant and machinery will increase the stock of capital; new raw materials may be discovered; technological advances are likely to take place; through education and training, labour is likely to become more productive. This growth in potential output is illustrated by an outward shift in the production possibility curve. This will then allow actual output to increase: for example, from point *x* to point *x'* in Figure 1.4.

?

Will economic growth always involve a parallel outward shift of the production possibility curve?

Illustrating economic issues: the circular flow of goods and incomes

The process of satisfying human wants involves producers and consumers. The relationship between them is two-sided and can be represented in a flow diagram (see Figure 1.5).

The consumers of goods and services are labelled 'households'. Some members of households, of course, are also

> ### Definition
>
> **Investment** The production of items that are not for immediate consumption.

> **Figure 1.3**   Making a fuller use of resources
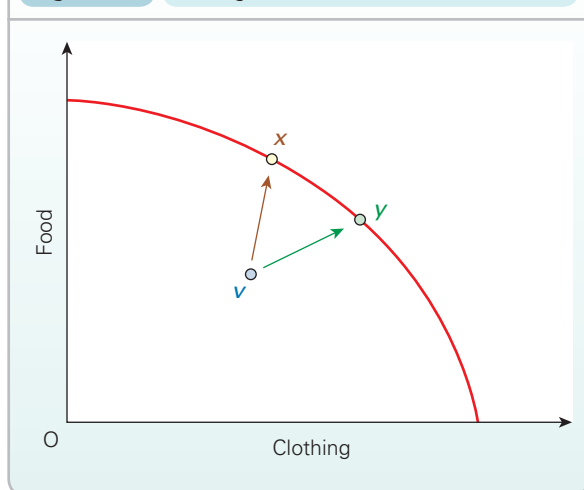
> **Figure 1.4**   Growth in actual and potential output

| **Figure 1.5** | Circular flow of goods and incomes |

Goods and services

£
Consumer
expenditure

Wages, rent,
dividends, etc.
£

Services of factors of production (labour, etc.)
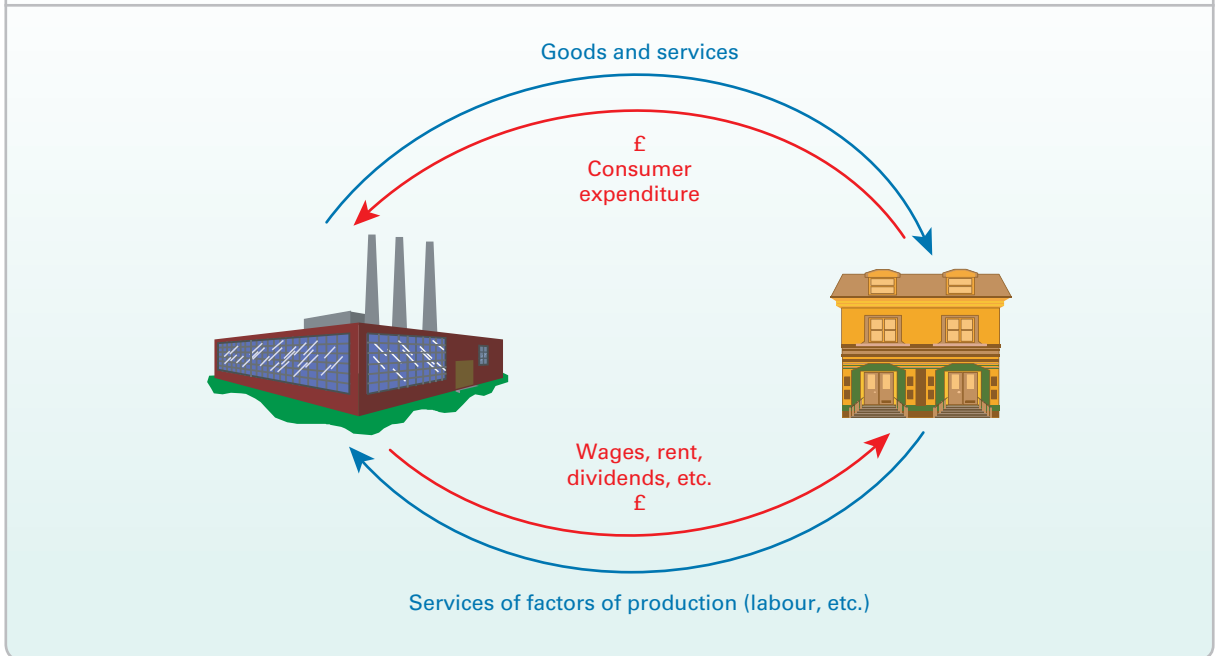
workers, and in some cases are the owners of other factors of production too, such as land. The producers of goods and services are labelled 'firms'.[3]

Firms and households are in a twin 'demand and supply' relationship with each other.

First, in the top part of the diagram, households demand goods and services, and firms supply goods and services. In the process, exchange takes place. In a money economy (as opposed to a ***barter economy***), firms exchange goods and services for money. In other words, money flows from households to firms in the form of consumer expenditure, while goods and services flow the other way – from firms to households.

This coming together of buyers and sellers is known as a ***market*** – it could be a street market, a shop or a website offering online shopping. Thus we talk about the market for apples, for oil, for houses, for televisions, and so on.

Second, firms and households come together in the market for factors of production. This is illustrated in the bottom half of Figure 1.5. This time the demand and supply roles are reversed. Firms demand the use of factors of production owned by households – labour, land and capital. Households supply them. Thus the services of labour and other factors flow from households to firms, and in exchange firms pay

households money – namely, wages, rent, dividends and interest. Just as we referred to particular goods markets, so we can also refer to particular factor markets – the market for bricklayers, for footballers, for land, and so on.

So there is a circular flow of incomes. Households earn incomes from firms and firms earn incomes from households. The money circulates. There is also a circular flow of goods and services, but in the opposite direction. Households supply factor services to firms, which then use them to supply goods and services to households.

This flow diagram, like the production possibility curve, can help us to distinguish between microeconomics and macroeconomics.

Microeconomics is concerned with the composition of the circular flow: what combinations of goods make up the goods flow; how the various factors of production are combined to produce these goods; for whom the wages, dividends, rent and interest are paid out.

Macroeconomics is concerned with the total size of the flow and what causes it to expand and contract.

3 In practice, much of society's production takes place within the household for its members' own consumption. Examples include cooking, cleaning, growing vegetables, decorating and childcare. Also, firms buy from and sell to each other – whether it be raw materials, capital goods or semi-finished goods. Nevertheless, it is still useful to depict the flows of goods and services and money between households and firms when explaining the operation of markets.

Definitions

Barter economy An economy where people exchange goods and services directly with one another without any payment of money. Workers would be paid with bundles of goods.

Market The interaction between buyers and sellers.

Section summary

1. The central economic problem is that of scarcity. Given that there is a limited supply of factors of production (labour, land and capital), it is impossible to provide everybody with everything they want. Potential demands exceed potential supplies.

2. The subject of economics is usually divided into two main branches: macroeconomics and microeconomics.

3. Macroeconomics deals with aggregates such as the overall levels of unemployment, output, growth and prices in the economy.

4. Microeconomics deals with the activities of individual units within the economy: firms, industries, consumers, workers, etc. Because resources are scarce, people have to make choices. Society has to choose by some means or other *what* goods and services to produce, *how* to produce them and *for whom* to produce them. Microeconomics studies these choices.

5. Rational choices involve weighing up the marginal benefits of each activity against its marginal opportunity costs. If the marginal benefits exceed the marginal costs, it is rational to choose to do more of that activity.

6. The production possibility curve shows the possible combinations of two goods that a country can produce in a given period of time. Assuming that the country is already producing on the curve, the production of more of one good will involve producing less of the other. This opportunity cost is illustrated by the slope of the curve. If the economy is producing within the curve as a result of idle resources or inefficiency, it can produce more of both goods by taking up this slack. In the longer term, it can only produce more of both by shifting the curve outwards through investment, technological progress, etc.

7. The circular flow of goods and incomes shows the interrelationships between firms and households in a money economy. Firms and households come together in markets. In goods markets, firms supply goods and households demand goods. In the process, money flows from households to firms in return for the goods and services that the firms supply. In factor markets, firms demand factors of production and households supply them. In the process, money flows from firms to households as incomes for factor services.

1.3 DIFFERENT ECONOMIC SYSTEMS

The classification of economic systems

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All societies face the problem of scarcity. They differ considerably, however, in the way they tackle the problem. One important difference between societies is in the degree of government control of the economy: the extent to which government decides 'what', 'how' and 'for whom' to produce.

At the one extreme lies the completely ***planned or command economy***, where all the economic decisions are taken by the government.

At the other extreme lies the completely ***free-market economy***. In this type of economy there is no government intervention at all. All decisions are taken by individuals and firms. Households decide how much labour and other factors to supply, and what goods to consume. Firms decide what goods to produce and what factors to employ. The pattern of production and consumption that results depends on the interactions of all these individual demand and supply decisions in free markets.

In practice, all economies are a mixture of the two; it is the *degree* of government intervention that distinguishes different economic systems. In China, the government plays a large role, whereas in the USA, the government plays a much smaller role.

It is still useful to analyse the extremes, in order to put the different ***mixed economies*** of the real world into perspective.

The mixture of government and the market can be shown by the use of a spectrum diagram such as Figure 1.6. It shows where particular economies of the real world *typically* lie along the spectrum between the two extremes.

The diagram is useful in that it provides a simple picture of the mixture of government and the market that exists in various economies. It can also be used to show changes in the mixture over time or from responses to crises.

The problem with this type of classification is that it is one-dimensional and oversimplified. Countries differ in the *type* of government intervention as well as the level. For example, governments can intervene through planning, public ownership, regulation, taxes and subsidies, partnership schemes with private industry, and so on. Two countries

Definitions

Centrally planned or command economy An economy where all economic decisions are taken by the central authorities.

Free-market economy An economy where all economic decisions are taken by individual households and firms and with no government intervention.

Mixed economy An economy where economic decisions are made partly by the government and partly through the market. In practice all economies are mixed.

Figure 1.6	Classifying economic systems

Mid-1980s

N. Korea   China
　　　Cuba   Poland   France   UK   USA   Hong Kong

Totally planned economy ────────────────────────────── **Totally free-market economy**

N. Korea   Cuba   China   France   USA
　　　　　　　　　　　　　　　　　　　Poland   UK   China (Hong Kong)

Early 2020s
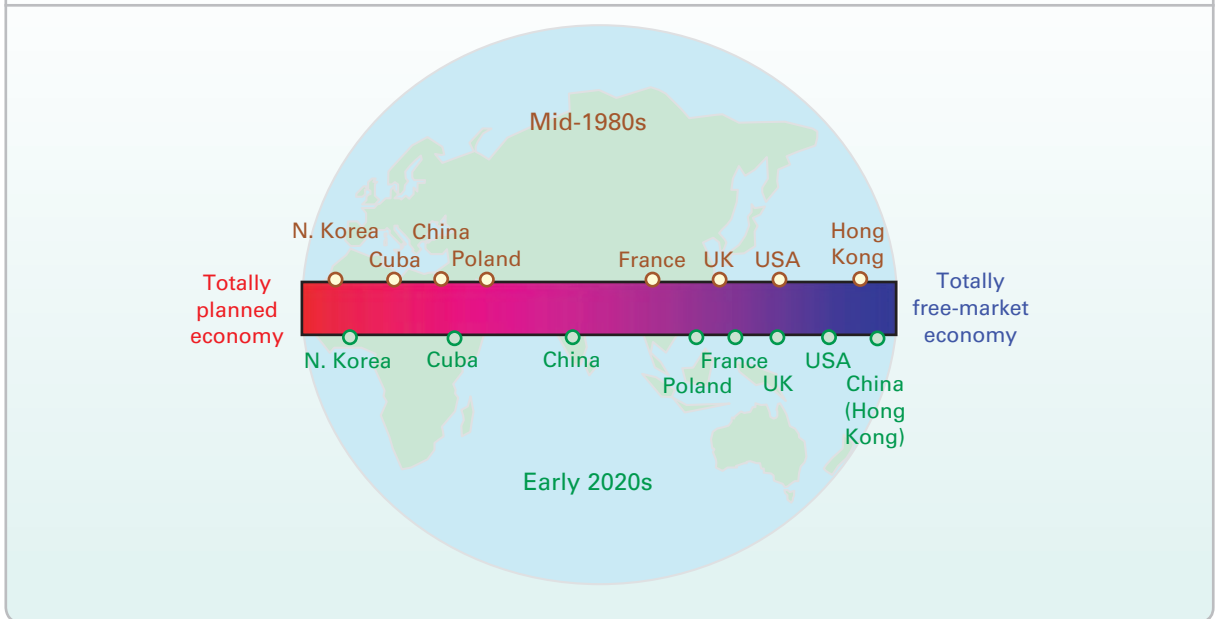
could be in a similar position along the spectrum but have very different types of government intervention.

Notice that there has been a general movement to the right along the spectrum since the 1980s. In former communist countries this has been a result of the abandonment of central planning and the adoption of private enterprise. In Western economies it has been a result of deregulation of private industry and privatisation (the selling of nationalised industries to the private sector).

? *How do you think the positions of these eight countries will change over the next decade?*

The informal sector: a third dimension

In all societies, many economic decisions are made, whether individually or in groups, which involve neither the government nor the market. For example, many of the activities taking place in the home, such as cooking, cleaning, gardening and care for children or the elderly, can be seen as 'economic' activities. There is an output (such as a meal or a service provided) and there is an opportunity cost to the provider (in terms of alternative activities forgone). And yet no money changes hands. Similarly, many of the activities done in groups, such as clubs and charities, involve the provision of goods and/or services, but again, no money changes hands.

These activities are taking place in the *informal sector*. The relative size of the informal sector varies from one country to another and over time. In rich countries, as more women continue to work after having children, and as working hours have increased, many people employ others to do the jobs, such as cleaning and childcare, that they once did

themselves. What was once part of the informal sector is now part of the market sector.

In many developing countries, much of the economic activity in poorer areas involves *subsistence production*. This is where people grow their own food, build their own shelter, etc. While some of the inputs (e.g. building materials) may have to be purchased through the market, much of this production is in the informal sector and involves no exchange of money. The importance of the informal sector, particularly to developing countries, should not be underestimated. This is an area of increasing interest to many economists, particularly those interested in the downsides of economic growth.

The command economy

The command economy is usually associated with a socialist or communist economic system, where land and capital are collectively owned. The state plans the allocation of resources at three levels:

■ It plans the allocation of resources between current consumption and investment for the future. By sacrificing

Definitions

Informal sector The parts of the economy that involve production and/or exchange, but where there are no money payments.

Subsistence production Where people produce things for their own consumption.

some present consumption and diverting resources into investment, it could increase the economy's growth rate.

The amount of resources it chooses to devote to investment will depend on its broad macroeconomic strategy: the importance it attaches to growth as opposed to current consumption.

- At a microeconomic level, it plans the output of each industry and firm, the techniques that will be used, and the labour and other resources required by each industry and firm.

In order to ensure that the required inputs are available, the state would probably conduct some form of *input–output analysis*. All industries are seen as users of inputs from other industries and as producers of output for consumers or other industries. For example, the steel industry uses inputs from the coal and iron-ore industries and produces output for the vehicle and construction industries. Input–output analysis shows, for each industry, the sources of all its inputs and the destination of all its output. By using such analysis the state attempts to match up the inputs and outputs of each industry so that the planned demand for each industry's product is equal to its planned supply.

- It plans the distribution of output between consumers. This will depend on the government's aims. It may distribute goods according to its judgement of people's needs; or it may give more to those who produce more, thereby providing an incentive for people to work harder. It may distribute goods and services directly (for example, by a system of rationing); or it may decide the distribution of money incomes and allow individuals to decide how to spend them. If it does the latter, it may still seek to influence the pattern of expenditure by setting appropriate prices: low prices to encourage consumption, and high prices to discourage consumption.

Assessment of the command economy

With central planning, the government could take an overall view of the economy. It could direct the nation's resources in accordance with specific national goals.

High growth rates could be achieved if the government directed large amounts of resources into investment. Unemployment could be largely avoided if the government carefully planned the allocation of labour in accordance with

Definition

Input–output analysis This involves dividing the economy into sectors, where each sector is a user of inputs from and a supplier of outputs to other sectors. The technique examines how these inputs and outputs can be matched to the total resources available in the economy.

production requirements and labour skills. National income could be distributed more equally or in accordance with needs. The social repercussions of production and consumption (e.g. the effects on the environment) could be taken into account, provided the government was able to predict these effects and chose to take them into account.

In practice, a command economy could achieve these goals only at considerable social and economic cost. The reasons are as follows:

- The larger and more complex the economy, the greater the task of collecting and analysing the information essential to planning, and the more complex the plan. Complicated plans are likely to be costly to administer and involve cumbersome bureaucracy.
- If there is no system of prices, or if prices are set arbitrarily by the state, planning is likely to involve the inefficient use of resources. It is difficult to assess the relative efficiency of two alternative techniques that use different inputs if there is no way in which the value of those inputs can be ascertained. For example, how can a rational decision be made between an oil-fired and a coal-fired furnace if the prices of oil and coal do not reflect their relative scarcity?

- It is difficult to devise appropriate incentives to encourage workers and managers to be more productive without a reduction in quality. For example, if bonuses are given according to the quantity of output produced, a factory might produce shoddy goods, since it can probably produce a larger quantity of goods by cutting quality. To avoid this problem, a large number of officials may have to be employed to check quality.
- Complete state control over resource allocation would involve a considerable loss of individual liberty. Workers would have no choice where to work; consumers would have no choice what to buy.
- If production is planned, but consumers are free to spend money incomes as they wish, there will be a problem if the wishes of consumers change. Shortages will occur if consumers decide to buy more; surpluses will occur if they decide to buy less.

Most of these problems were experienced in the former Soviet Union and the other Eastern bloc countries, and were part of the reason for the overthrow of their communist regimes (see Box 1.5).

The free-market economy

Free decision making by individuals

In a free market, individuals are free to make their own economic decisions. Consumers are free to decide what to buy with their incomes: free to make demand decisions. Firms are free to choose what to sell and what production methods to use: free to make supply decisions. The demand and supply decisions of consumers and firms are transmitted to

each other through their effect on prices: through the *price mechanism*. The prices that result are the prices that firms and consumers have to accept.

The price mechanism

The price mechanism works as follows. Prices respond to shortages and surpluses. Shortages result in prices rising. Surpluses result in prices falling. Let us take each in turn.

If consumers want more of a good (or if producers decide to cut back supply), demand will exceed supply. The resulting shortage will cause the price of the good to rise. This will act as an incentive to producers to supply more, since production will now be more profitable. At the same time it will discourage consumers from buying so much. *The price will continue rising until the shortage has been eliminated*.

If, on the other hand, consumers decide they want less of a good (or if producers decide to produce more), then supply will exceed demand. The resulting surplus will cause the price of the good to fall. This will act as a disincentive to producers, who will supply less, since production will now be less profitable. It will encourage consumers to buy more. *The price will continue falling until the surplus has been eliminated*.

This price, where demand equals supply, is called the **equilibrium price**. By **equilibrium** we mean a point of balance or a point of rest: in other words, a point towards which there is a tendency to move.

> **1.** *Try using the same type of analysis in the labour market to show what will happen if there is an increase in demand for labour. What is the 'price' of labour?*
> **2.** *Can you think of any examples where prices and wages do not adjust very rapidly to a shortage or surplus? For what reasons might they not do so?*

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The response of demand and supply to changes in price illustrates a very important feature of how economies work: *people respond to incentives*. It is important, therefore, that incentives are appropriate and have the desired effect. This is the fifth of our 15 threshold concepts (see Chapter 2, page 48).

Definitions

Price mechanism The system in a market economy whereby changes in price in response to changes in demand and supply have the effect of making demand equal to supply.

Equilibrium price The price where the quantity demanded equals the quantity supplied: the price where there is no shortage or surplus.

Equilibrium A position of balance. A position from which there is no inherent tendency to move away.

The effect of changes in demand and supply

How will the price mechanism respond to changes in consumer demand or producer supply? Patterns of consumer demand will change over time: for example, people may decide they want more fixed gear bikes and fewer mountain bikes. Likewise the pattern of supply changes: for example, changes in technology may allow the mass production of microchips at lower cost, while the production of hand-built furniture becomes relatively expensive.

In all cases of changes in demand and supply, the resulting changes in price act as both signals and incentives.

A change in demand.   A rise in demand is signalled by a rise in price, which then acts as an incentive for supply to rise. The high price of these goods relative to their costs of production signals that consumers are willing to see resources diverted from other uses. This is just what firms do. They divert resources from goods with lower prices relative to costs (and hence lower profits) to those goods that are more profitable.

A fall in demand is signalled by a fall in price. This then acts as an incentive for supply to fall. The goods are now less profitable to produce.

A change in supply.   A rise in supply is signalled by a fall in price. This then acts as an incentive for demand to rise. A fall in supply is signalled by a rise in price. This then acts as an incentive for demand to fall.

The fact that markets adjust so as to equate demand and supply is our fourth 'Threshold Concept', which is discussed in Chapter 2, page 45.

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> **KEY IDEA 5**
>
> ***Changes in demand or supply cause markets to adjust.*** Whenever such changes occur, the resulting 'disequilibrium' will bring an automatic change in prices, thereby restoring equilibrium (i.e. a balance of demand and supply).

> **1.** *Why do the prices of fresh vegetables fall when they are in season? Could an individual farmer prevent the price falling?*
> **2.** *If you were the manager of a supermarket, how would you set about deciding what prices to charge for food approaching its sell-by date?*
> **3.** *Demand for streaming music has grown rapidly, yet the subscription prices have not increased. Why?*

BOX 1.5 COMMAND ECONOMIES

The rise and fall of planning

Russia

The Bolsheviks under the leadership of Lenin came to power in Russia with the October revolution of 1917. Communism was introduced and the market economy abolished. Industries were nationalised; workers were told what jobs to do; food was taken from peasants to feed the towns; workers were allocated goods from distribution depots.

With the ending of the civil war in 1921, the economy was in bad shape and Lenin embarked on the New Economic Policy. This involved a return to the use of markets. Smaller businesses were returned to private hands and peasants were able to sell their crops. The economy began to recover; however, Lenin died in 1924 and Stalin came to power.

The Russian economy underwent a radical transformation from 1928 onwards. The key features of the Stalinist approach were collectivisation, industrialisation and central planning. Peasant farms were abolished and replaced by large-scale collective farms where land was collectively owned and worked, and by state farms, owned by the state and run by managers. This caused disruption and famine, with peasants slaughtering their animals rather than giving them up. However, in the longer term more food was produced. Both collective and state farms were given quotas of output that they were supposed to deliver, for which the state would pay a fixed price.

Alongside the agricultural reforms a drive to industrialisation took place and a vast planning apparatus was developed. At the top was *Gosplan*, the central planning agency. This prepared five-year plans, which specified the general direction in which the economy was to move, and annual plans, which gave details of what was to be produced and with what resources for some 200 or so key products. The system operated without either the price mechanism or the profit motive, although incentives existed with bonuses paid to managers and workers if targets were achieved.

Stalin died in 1953, but the planning system remained largely unchanged throughout the Soviet Union until the late 1980s. Initially, high growth rates had been achieved, though at a cost of low efficiency. Poor flows of information led to inconsistencies in the plans. Targets were often unrealistic, and as a result there were frequent shortages and sometimes surpluses. There was little product innovation and goods were frequently of poor quality. A large 'underground economy' flourished in which goods were sold on the illegal market and in which people did second 'unofficial' jobs.

Moves to the market

By the time Gorbachev came to power in 1985 many people were pressing for economic reform. Gorbachev responded with his policy of perestroika (economic reconstruction), which involved managers preparing their own plans and managers and workers being rewarded for becoming more efficient. Under the new system, one-person businesses and larger co-operatives were allowed, while the price mechanism was reintroduced with the state raising prices if there were substantial shortages.

These reforms, however, did not halt the economic decline. Managers resented the extra responsibilities and people were unclear as to what to expect from the state. Queues lengthened in the shops and people became disillusioned with *perestroika*.

Communism fell apart in 1989 and both the Soviet Union and the system of central planning came to an end. Russia embarked upon a radical programme of market reforms in which competition and enterprise were intended to replace state central planning (see Case Studies 1.5, Free-market medicine in Russia; 14.9, Privatisation in transition economies; and 14.10, Forms of privatisation in transition countries, on the student website).

Initially, the disruption of the move to the market led to a sharp decline in the Russian economy. GDP fell by an average of 5.5 per cent per annum between 1993 and 1998. This was followed by a period of rapid economic growth, which averaged 7 per cent from 2000 to 2008. But the economy declined by nearly 8 per cent in the 2009 recession. Although this was followed by growth rates of 4.5 and 5.1 per cent in 2010 and 2011, since then growth has averaged only 1.4 per cent. Many commentators point to decades of underinvestment in industry and in road and rail infrastructure, corruption, disillusionment and continuing political uncertainty as root causes of this sluggish growth rate. From 2014, the economy was further dampened by Western economic sanctions in response to Russia's annexation of Crimea and the continuing conflict in Eastern Ukraine. Russia went into recession in 2015, but rebounded in 2017 and 2018 only to go back into recession with the onset of the coronavirus pandemic.

The interdependence of markets

The interdependence of goods and factor markets. A rise in demand for a good will raise its price and profitability. Firms will respond by supplying more. But to do this they will need more inputs. Thus the demand for the inputs (factors of production) will rise, which in turn will raise the price of the inputs. The suppliers of inputs will respond to this incentive by supplying more. This can be summarised as follows:

1. Goods market
   - Demand for the good rises.
   - This creates a shortage.
   - This causes the price of the good to rise.
   - This eliminates the shortage by reducing demand and encouraging firms to produce more.
2. Factor market
   - The increased supply of the good causes an increase in the demand for factors of production (i.e. inputs) used in making it.
   - This causes a shortage of those inputs.
   - This causes their prices to rise.
   - This eliminates their shortage by reducing demand and encouraging the suppliers of inputs to supply more.

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Economic growth in China and Russia
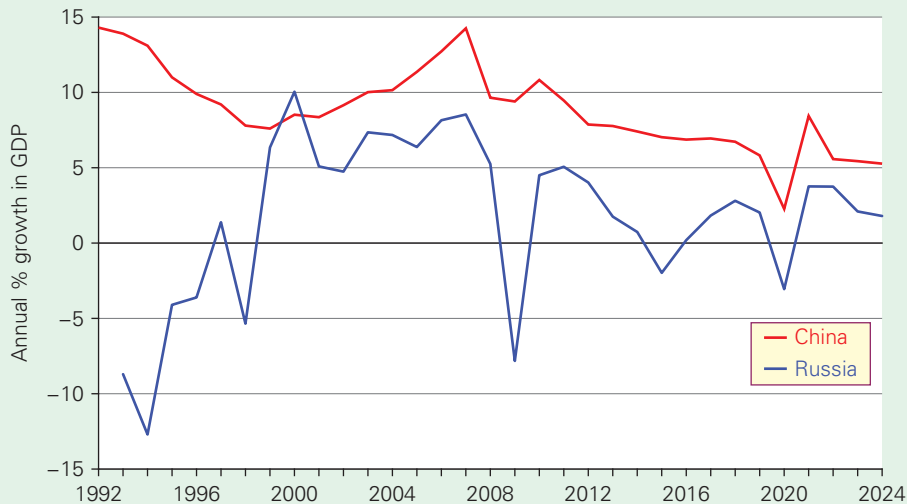
Note: Figures from 2021 based on forecasts

Source: Data drawn from *World Economic Outlook Database,* IMF (April 2021),
www.imf.org/en/Publications/WEO/weo-database/2021/April

China

In contrast to the Soviet Union, China's move towards a more market-based economy has been carefully managed by the ruling Communist Party. From the 1940s to the 1970s central planning, combined with the removal of all property rights, resulted in low productivity, a creaking infrastructure and famine.

But after the death of Party Chairman Mao Zedong in 1976, a new breed of Chinese leaders came to power, and they were increasingly pragmatic. There was a focus on making use of aspects of capitalism alongside government control of the economy. Productivity was valued equally with political stability, while consumer welfare was considered as important as the elimination of unemployment. Economic zones were set up, where foreign investment was encouraged, and laws on patents and other intellectual property encouraged innovation. This approach was developed further over the following decades and from 1992 to 2010 China averaged growth of 10.5 per cent per annum – the highest in the world.

Today, China is the world's second largest economy and, although growth has slowed somewhat to around 6 per cent, is poised to overtake the USA by the mid-2020s, albeit with much lower output *per head*. Yet its human rights record remains a concern to many around the world; economic liberalisation and growth have not been accompanied by political freedom. Furthermore, it is experiencing some of the problems of capitalism: pollution, income inequality and potential instability of the financial system. It remains unclear how long the combination of capitalist economics alongside tight political control can continue to deliver.

Investigate some examples of market reforms in either China or Russia and discuss their likely effects.

So changes in goods markets will lead to changes in factor markets. Figure 1.7 summarises this sequence of events, where the subscripts 'g' and 'f' refer to the good and the factors used in making it respectively. (It is common in economics to summarise an argument like this by using symbols.)

Interdependence exists in the other direction too: factor markets affect goods markets. For example, the discovery of raw materials will lower their price. This will lower the costs of production of firms using these raw materials and will increase the supply of the finished goods. The resulting surplus will lower the price of the good, which will encourage consumers to buy more.

Summarise this last paragraph using symbols like those in Figure 1.7.

The interdependence of different goods markets.   A rise in the price of one good will encourage consumers to buy alternatives. This will drive up the price of alternatives. This in turn will encourage producers to supply more of the alternatives.

Are different factor markets similarly interdependent? What would happen if the price of capital equipment rose?

Figure 1.7   The price mechanism: the effect of a rise in demand

Goods market

$$D_g \uparrow \longrightarrow \text{shortage} \longrightarrow \boxed{P_g \uparrow} \overset{S_g \uparrow}{\underset{D_g \downarrow}{\nearrow}} \text{ until } D_g = S_g$$
$$(D_g > S_g)$$

Factor market

$$S_g \uparrow \longrightarrow D_f \uparrow \longrightarrow \text{shortage} \longrightarrow \boxed{P_f \uparrow} \overset{S_f \uparrow}{\underset{D_f \downarrow}{\nearrow}} \text{ until } D_f = S_f$$
$$(D_f > S_f)$$
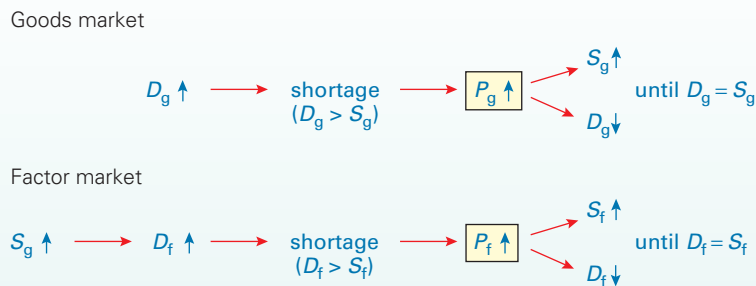
Conclusion

Even though all individuals are merely looking to their own self-interest in the free-market economy, they are in fact being encouraged to respond to the wishes of others through the incentive of the price mechanism. (See Case Study 1.4, The interdependence of markets, on the student website; see also Box 1.6.)

Assessment of the free-market economy

The fact that a free-market economy functions automatically is one of its major advantages. There is no need for costly and complex bureaucracies to co-ordinate economic decisions. The economy can respond quickly to changing demand and supply conditions.

When markets are highly competitive, no one has great power. Competition between firms keeps prices down and acts as an incentive for efficiency. The more firms there are competing, the more responsive they will be to consumer wishes.

The more efficiently firms can combine their factors of production, the more profit they will make. The more efficiently workers work, the higher their wages are likely to be. The more carefully consumers decide what to buy, the greater the value for money they will receive.

Thus people pursuing their own self-interest through buying and selling in competitive markets helps to minimise the central economic problem of scarcity, by encouraging the efficient use of society's resources in line with consumer wishes. From this type of argument, the following conclusion is often drawn by defenders of the free market: 'The pursuit of private gain results in the social good.' This claim is the subject of much debate and has profound moral implications (see Threshold Concept 2).

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BOX 1.6   ADAM SMITH (1723–90)   EXPLORING ECONOMICS

The 'invisible hand' of the market

Many economists would argue that modern economics dates from 1776, the year in which Adam Smith's *An Inquiry into the Nature and Causes of the Wealth of Nations* was published – one of the most important books on economics ever written.

The work, in five books, is very wide-ranging, but the central argument is that market economies generally serve the public interest well. Markets guide production and consumption like an *invisible hand*. Even though everyone is looking after their own private self-interest, their interaction in the market will lead to the social good.

In book I, Chapter 2, Smith writes:

Man has almost constant occasion for the help of his brethren and it is in vain for him to expect it from their benevolence only . . . It is not from the benevolence of the butcher, the brewer, or the baker that we expect our dinner, but from their regard to their own interest. We address ourselves, not to their humanity but to their self-love, and never talk to them of our own necessities, but of their advantages.

Later, in book IV, Chapter 2, he continues:

Every individual is continually exerting himself to find out the most advantageous employment of whatever capital he can command. It is his own advantage, indeed, and not that of the society, which he has in view. But the study of his own advantage naturally, or rather necessarily, leads him to prefer that employment which is most advantageous to the society . . . he intends only his own gain, and he is in this, as in many other cases, led by an invisible hand to promote an end which was no part of his intention. Nor is it always the worse for the society that it was no part of it. By pursuing his own interest he frequently promotes that of society more effectually than when he really intends to promote it.

He argued, therefore, with one or two exceptions, that the state should not interfere with the functioning of the economy.

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It should adopt a laissez-faire or 'hands-off' policy. It should allow free enterprise for firms and free trade between countries.

This praise of the free market has led many on the political right to regard him as the father of the 'libertarian movement' – the movement that advocates the absolute minimum amount of state intervention in the economy (see Box 12.7 on page 397). In fact, one of the most famous of the libertarian societies is called the Adam Smith Institute.

But Smith was not blind to the drawbacks of unregulated markets. In book I, Chapter 7, he looks at the problem of monopoly:

A monopoly granted either to an individual or to a trading company has the same effect as a secret in trade or manufactures. The monopolists, by keeping the market constantly under-stocked, by never fully supplying the effectual demand, sell their commodities much above the natural price, and raise their emoluments, whether they consist in wages or profit, greatly above their natural rate.

Later on he looks at the dangers of firms getting together to pursue their mutual interest:

People of the same trade seldom meet together, even for merriment or diversion, but the conversation ends in a conspiracy against the public or in some contrivance to raise prices.

Problems of the free market

In practice, however, markets do not achieve maximum efficiency in the allocation of scarce resources, and governments therefore feel it necessary to intervene to rectify this and other problems of the free market. The problems of a free market include:

- **KI 4** **p13** Power and property may be unequally distributed. Those who have power and/or property (e.g. big business, unions and landlords) will gain at the expense of those without power and property.
- Competition between firms is often limited. A few firms may dominate an industry, charging high prices and making large profits.
- Consumers and firms may not have full information about the costs and benefits associated with different goods and factor inputs and may thus make the wrong decisions.
- Rather than responding to consumer wishes, firms may attempt to persuade consumers by advertising.
- Lack of competition and high profits may remove the incentive for firms to be efficient.
- The practices of some firms may be socially undesirable. For example, a chemical works may pollute the environment.
- Some socially desirable goods would simply not be produced by private enterprise. Who would carry out counter-terrorism activities if this were not funded by governments?
- A free-market economy may lead to macroeconomic instability. There may be periods of recession with high unemployment and falling output, and other periods of rising prices.
- **TC 3** **p26** Finally, there is the ethical objection, that a free-market economy, by rewarding self-interested behaviour, may encourage selfishness, greed, materialism and the acquisition of power.

The fact that free markets may fail to meet various social objectives is Threshold Concept 3.

The mixed economy

Because of the problems of both free-market and command economies, all real-world economies are a mixture of the two systems.

In *mixed market economies*, the government may control the following:

- *Relative prices* of goods and inputs, by taxing or subsidising them or by direct price controls.
- Relative incomes, by the use of income taxes, welfare payments or direct controls over wages, profits, rents, etc.
- The pattern of production and consumption, by the use of legislation (e.g. making it illegal to produce unsafe goods), by direct provision of goods and services (e.g. education and defence) or by taxes and subsidies.
- The macroeconomic problems of unemployment, inflation, lack of growth, balance of trade deficits and exchange rate fluctuations, by the use of taxes and government expenditure, the control of bank lending and interest rates, the direct control of prices and the control of foreign exchange rates.

The fact that government intervention can be used to rectify various failings of the market is Threshold Concept 7 (see Chapter 3, page 79). It is important to realise, however, that government actions may bring adverse as well as beneficial consequences. For more on government intervention in the mixed economy see Chapters 11 to 14.

TC 7 **p79**

Definitions

Mixed market economy A market economy where there is some government intervention.

Relative price The price of one good compared with another (e.g. good X is twice the price of good Y).

THRESHOLD CONCEPT 2   PEOPLE GAIN FROM VOLUNTARY ECONOMIC INTERACTION   THINKING LIKE AN ECONOMIST

Economic interaction between people can take a number of different forms. Sometimes it takes place in markets. For example, when goods are exchanged, there is interaction between the consumer and the shop. When someone is employed, there is interaction between the employer and the employee. When a firm buys raw materials, there is interaction between the purchasing firm and the selling firm.

In each case there is expected to be a mutual gain. If there wasn't, the interaction would not take place. If you go on a holiday costing £400, then assuming the holiday turns out as you expected, you will have gained. You would rather have the holiday than spend the £400 on something else. The marginal benefit to you exceeds the marginal cost. The travel agent and tour operator also gain. They make a profit on selling you the holiday. It is a 'win–win situation'. This is sometimes called a *positive sum game*: an interaction where there is a positive net gain.

Another example is international trade (the subject of Chapter 24). If two countries trade with each other, there will be a net gain to both of them. If there wasn't, they would not trade. Both countries will end up consuming a greater value of products than they could without trade. The reason is that each country can specialise in the products it is relatively good at producing (compared to the other country) and export them, and import from the other country the goods it is relatively poor at producing.

That there is a net gain from voluntary interaction is a *threshold concept* because realising this tends to change the way we look at economic activity. Often it is important to identify what these overall gains are so that we can compare them with alternative forms of interaction. For example, even though both workers and their employer respectively gain from the wages currently paid and the output currently produced, it might still be possible to reorganise the workforce in a way that increases production. This could allow the employer to pay higher wages and still gain an increase in profits. Both sides could thus gain from constructive negotiation about wages and new work practices.

Sometimes it may appear that voluntary interaction results in one side gaining and the other losing. For example, a firm may raise its price. It gains and the consumer loses. But is this strictly true? Consumers are certainly worse off than before, but as long as they are still prepared to buy the product, they must consider that they are still gaining more by buying it than by not. There is still a gain to both sides: it's just that the firm is gaining more and the consumer is gaining less.

?
1. *Would you ever swap things with friends if both of you did not gain? Explain your answer.*
2. *Give one or two examples of involuntary (i.e. compulsory) economic interaction, where one side gains but the other loses.*

THRESHOLD CONCEPT 3   MARKETS MAY FAIL TO MEET SOCIAL OBJECTIVES   THINKING LIKE AN ECONOMIST

We have seen that market forces can automatically equate demand and supply. The outcomes of the process may be desirable, but they are by no means always so. Unrestrained market forces can result in severe problems for individuals, society and the environment.

Markets tend to reflect the combined actions of individual consumers and firms. But when consumers and firms make their decisions, they may act selfishly and fail to take account of the broader effects of their actions. If people want to buy guns, market forces will make their supply profitable. If people want to drive fuel-hungry cars, then this will create the market for firms to supply them. Market forces are not kind and caring. They mechanically reflect human behaviour.

And it's not just selfish behaviour that markets reflect, but ignorance too. You may be unaware that a toy you buy for a child is dangerous, but by buying it, you encourage unscrupulous firms to supply them. A firm may not realise that a piece of machinery it uses is dangerous until an accident happens. In the meantime, it continues using it because it is profitable to do so.

If wages are determined purely by demand and supply, then some people, such as footballers and bankers, may be very

well paid. Others, such as cleaners and shop workers, may be very poorly paid. If the resulting inequality is seen as unfair, then market forces alone will not be enough to achieve a fair society.

Recognising the limitations and failings of markets is a *threshold concept*. It helps us to understand how laws or taxes or subsidies could be framed to counteract such failings. It helps us to relate the mechanical operation of demand and supply to a whole range of social objectives and ask whether the market system is the best way of meeting such objectives.

But to recognise market failures is only part of the way to finding a solution. Can the government put things right, and if so, how? Or do the limitations of government mean that the solution is sometimes worse than the problem? We examine these issues in many parts of the book. We set the scene in Threshold Concept 7 on page 79.

?
1. *If global warming affects all of us adversely, why in a purely market economy would individuals and firms continue with activities that contribute towards global warming?*
2. *In what ways do your own consumption patterns adversely affect other people?*

Section summary

1. The economic systems of different countries vary according to the extent to which they rely on the market or the government to allocate resources.

2. At the one extreme, in a command economy, the state makes all the economic decisions. It plans amounts of resources to allocate for present consumption and amounts for investment for future output. It plans the output of each industry, the methods of production it will use and the amount of resources it will be allocated. It plans the distribution of output between consumers.

3. A command economy has the advantage of being able to address directly various national economic goals, such as rapid growth and the avoidance of unemployment and inequality. A command economy, however, is likely to be inefficient and bureaucratic; prices and the choice of production methods are likely to be arbitrary; incentives may be inappropriate; shortages and surpluses may result.

4. At the other extreme is the free-market economy. In this economy, decisions are made by the interaction of demand and supply. Price changes act as the mechanism whereby demand and supply are balanced. If there is a shortage, price will rise until the shortage is eliminated. If there is a surplus, price will fall until that is eliminated.

5. A free-market economy functions automatically and if there is plenty of competition between producers this can help to protect consumers' interests. In practice, however, competition may be limited; there may be great inequality; there may be adverse social and environmental consequences; there may be macroeconomic instability.

6. In practice, all economies are some mixture of the market and government intervention. It is the degree and form of government intervention that distinguishes one type of economy from another.

1.4 THE NATURE OF ECONOMIC REASONING

Economics is one of the social sciences. So in what sense is it a *science*? Is it like the natural sciences such as physics and astronomy? What is the significance of the word 'social' in social science? What can economists do, and what is their role in helping governments devise economic policy?

Economics as a science

The methodology employed by economists has a lot in common with that employed by natural scientists. Both attempt to construct theories or *models* which are then used to *explain* and *predict*. An astronomer, for example, constructs models of planetary movements to *explain* why planets are in the position they are and to *predict* their position in the future.

Models in economics

In order to explain and predict, the economist constructs models which show simplified relationships between various economic phenomena. The simplification is deliberate – economists know their models look nothing like the real world they hope to explain. It is referred to as abstraction. An example of a model is one showing the relationships between demand, supply and price of a product. Although most models can be described verbally, they can normally be represented more precisely in graphical or mathematical form.

Building models

Models are constructed by making general hypotheses about the causes of economic phenomena: for example, that consumer demand will rise when consumer incomes rise. These hypotheses will often be based on observations. This process of making general statements from particular observations is known as *induction*.

Using models

Explanation. Models explain by showing how things are caused: what the causes of inflation are, why workers in some industries earn more than others, and so on. A model is constructed to help explain a particular relationship or set of phenomena. An economic model might be really useful for one purpose but not very useful for another.

Prediction. Models are sometimes used to make simple forecasts: for example, inflation will be below 5 per cent next year. Usually, however, predictions are of the 'If . . . then . . .' variety: for example, if demand for good *x* rises, its price will rise. This process of drawing conclusions from models is known as *deduction*.

When making such deductions it has to be assumed that nothing else that can influence the outcome has changed in the meantime. For example, if demand for

Definitions

Economic model A formal presentation of an economic theory.

Induction Constructing general theories on the basis of specific observations.

Deduction Using a theory to draw conclusions about specific circumstances.

good *x* rises, its price will rise *assuming* the cost of producing good *x* has not fallen. This is known as the ***ceteris paribus*** assumption. *Ceteris paribus* is Latin for 'other things being equal'.

Assessing models

Models can be judged according to how successful they are in explaining and predicting. They are not judged by how closely they resemble the real world.

If the predictions are wrong, the first thing to do is to check whether the deductions were correctly made. If they were, the model must be either adapted or abandoned in favour of an alternative model with better predictive ability. But in economics, as with many other disciplines, academics are often unwilling to abandon their models. Instead they prefer the minimum adaptation necessary. This can lead to lively debates between different 'schools of thought', each claiming that their models paint a more accurate picture of the economy.

There has been a great deal of debate in recent years about why economic models failed to forecast the financial crisis of 2007–8. In September 2010, Ben Bernanke, the then Federal Reserve Board Chairman, said the failure of the economic models did not mean that they were irrelevant or significantly flawed. Rather than throwing out the models, more work was needed to capture how the financial system impacts on growth and stability. Some people argued that the models were simply misused: i.e. used for a purpose they were not designed for. John Kay argued it was like using a London Underground map to work out the best walking route![4]

Others disagreed. They claimed that many of the main models that had failed to predict the crisis were fundamentally flawed and needed replacing with other models – perhaps amended versions of older ones; perhaps new ones. We look at these debates in Parts E and F of the book.

4 John Kay, *Obliquity* (Profile Books, 2010).

Economists as detectives

Because of a lack of conclusive evidence about just how many parts of the economy function, economists also need the skills of detectives. This involves a third type of reasoning (in addition to induction and deduction), known as ***abduction***. This involves making informed guesses or estimates from limited evidence. It is using the scraps of evidence as clues to what might be really going on. It is how many initial hypotheses are formed. Then the researcher (or detective) will use the clues to search for more evidence that can be used for induction that will yield a more robust theory. The clues may lead to a false trail, but sometimes they may allow the researcher to develop a new theory or amend an existing one. A good researcher will be alert to clues; to seeing patterns in details that might previously have been dismissed or gone unnoticed.

Before the banking crisis of 2007–8 and the subsequent credit crunch and recession in the developed world, many economists were picking up clues and trying to use them to develop a theory of systemic risk in financial markets. They were using the skills of an economic detective to try to discover not only what was currently going on but also what might be the consequences for the future. Some used abductive reasoning successfully to predict the impending crisis; most did not.

Definitions

Ceteris paribus Latin for 'other things being equal'. This assumption has to be made when making deductions from theories.

Abduction Using pieces of evidence to develop a plausible explanation. This can then be tested by gathering more evidence.

| BOX 1.7 | *CETERIS PARIBUS* | CASE STUDIES AND APPLICATIONS |

Because of the complexities of the real world, economic models have to make various simplifying assumptions. Sometimes, however, economists are criticised for making unrealistic assumptions, assumptions that make their models irrelevant. The following joke illustrates the point.

There were three people cast away on a desert island: a chemist, an engineer and an economist. There was no food on the island and their plight seemed desperate.

Then they discovered a crate of canned food that had been washed up on the island. When they realised that they had no

means of opening the cans, they decided that each of them should use their expertise to find a solution.

The chemist searched around for various minerals that could be heated up to produce a compound that would burn through the lids of the cans.

The engineer hunted around for rocks and then worked out what height of tree they would have to be dropped from in order to smash open the cans.

Meanwhile the economist sat down and thought 'Assuming we had a can opener . . . '.

Economics as a social science

Economics concerns human behaviour. One problem here is that individuals often behave in very different ways. People have different tastes and different attitudes. This problem, however, is not as serious as it may seem at first sight. The reason is that people *on average* are likely to behave more predictably. For example, if the price of a product goes up by 5 per cent, we might be able to predict, *ceteris paribus*, that the quantity demanded will fall by approximately 10 per cent. This does not mean that every single individual's demand will fall by 10 per cent, only that *total* demand will. Some people may demand a lot less; others may demand the same as before.

Even so, there are still things about human behaviour that are very difficult to predict, even when we are talking about whole groups of people. How, for example, will firms react to a rise in interest rates when making their investment decisions? This will depend on things such as the state of business confidence, something that is notoriously difficult to predict. How will a business respond to price changes by its rivals? This will often depend on how it thinks its rivals themselves will react to its own response. How will people respond to a crisis, such as the global banking and credit crisis of 2007–8? This depends very much on the mood of financial and other companies and individuals. A mood of pessimism (or optimism for that matter) can quickly spread, but not to a degree that is easily predictable.

For these reasons there is plenty of scope for competing models in economics, each making different assumptions and leading to different policy conclusions. As a result, economics can often be highly controversial. As we shall see later on in the book, different political parties may adhere to different schools of economic thought. Thus the political left may adhere to a model which implies that governments must intervene if unemployment is to be cured, whereas the political right may adhere to a model which implies that unemployment will be reduced if the government intervenes less and relies more on the free market.

One branch of economics that has seen considerable growth in recent years is behavioural economics, which adds elements of psychology to traditional models in an attempt to gain a better understanding of decision making by investors, consumers and other economic participants. Much of the early evidence in support of behavioural economics came from laboratory experiments where people made decisions in simulated environments – normally a computer room. More recent evidence has come from field experiments, where people make decisions in a more natural environment and do not know their behaviour is being observed. For more on behavioural economics see Chapters 4, 5, 9, 10, 13 and 14.

The fact that there are different economic theories does not mean that economists always disagree. Despite the popular belief that 'if you laid all the economists of the world end to end they would still not reach a conclusion', there is in fact a large measure of agreement between economists about how to analyse the world and what conclusions to draw.

Economics and policy

Economists play a major role in helping governments to devise economic policy. In order to understand this role, it is necessary to distinguish between 'positive' and 'normative' statements.

A ***positive statement*** is a statement of fact. It may be right or wrong, but its accuracy can be tested by appealing to the facts. 'Unemployment is rising', 'Inflation will be over 6 per cent by next year' and 'If the government cuts taxes, imports will rise' are all examples of positive statements.

A ***normative statement*** is a statement of value: a statement about what ought or ought not to be, about whether something is good or bad, desirable or undesirable. 'It is right to tax the rich more than the poor', 'The government ought to reduce inflation' and 'State pensions ought to be increased' are all examples of normative statements. They cannot be proved or disproved by a simple appeal to the facts.

Economists can only contribute to questions of policy in a positive way. That is, they can analyse the consequences of following certain policies. They can say which of two policies is more likely to achieve a given aim, but they should not, as economists, say whether the aims of the policy are desirable. For example, economists may argue that a policy of increasing government expenditure will reduce unemployment and raise inflation, but they cannot, as economists, decide whether such a policy is desirable.

> **KEY IDEA 6**
>
> ***The importance of the positive/normative distinction.*** Economics can only contribute to policy issues in a positive way. Economists, as scientists, should not make normative judgements. They can make them only as individual people, with no more moral right than any other individual.

? Which of the following are positive statements and which are normative?
(a) Cutting the higher rates of income tax will redistribute incomes from the poor to the rich.
(b) It is wrong that inflation should be targeted if the consequence is higher unemployment.
(c) It is incorrect to state that putting up interest rates will reduce inflation.
(d) The government should introduce road pricing to address the issue of congestion.
(e) Current government policies should be aimed at reducing the deficit rather than stimulating growth.

Definitions

Positive statement A value-free statement which can be tested by an appeal to the facts.

Normative statement A value judgement.

Section summary

1. The methodology used by economists is similar to that used by natural scientists. Economists construct models, which they use to explain and predict economic phenomena. These models can be tested by appealing to facts and seeing how successfully they have been predicted or explained by the model. Unsuccessful models can be either abandoned or amended.

2. Being a social science, economics is concerned with human actions. Making accurate predictions in economics is very difficult given that economics has to deal with a constantly changing environment.

3. Economists can help governments to devise policy by examining the consequences of alternative courses of action. In doing this, it is important to separate positive questions about what the effects of the policies are from normative ones as to what the goals of policy should be. Economists in their role as economists have no superior right to make normative judgements. They do, however, play a major role in assessing whether a policy meets the political objectives of government (or opposition).

END OF CHAPTER QUESTIONS

1. Imagine that a country can produce just two things: goods and services. Assume that over a given period it could produce any of the following combinations:

Units of goods										
0	10	20	30	40	50	60	70	80	90	100

Units of services										
80	79	77	74	70	65	58	48	35	19	0

   (a) Draw the country's production possibility curve.
   (b) Assuming that the country is currently producing 40 units of goods and 70 units of services, what is the opportunity cost of producing another 10 units of goods?
   (c) Explain how the figures illustrate the principle of increasing opportunity cost.
   (d) Now assume that technical progress leads to a 10 per cent increase in the output of goods for any given amount of resources. Draw the new production possibility curve. How has the opportunity cost of producing extra units of services altered?

2. Imagine that you won millions of pounds on the National Lottery. Would your 'economic problem' be solved?

3. Assume that in a household one parent currently works full-time and the other stays at home to look after the family. How would you set about identifying and calculating the opportunity costs of the second parent now taking a full-time job? How would such calculations be relevant in deciding whether it is worth taking that job?

4. When you made the decision to study economics, was it a 'rational' decision (albeit based on the limited information you had available at the time)? What additional information would you like to have had in order to ensure that your decision was the right one?

5. In what way does specialisation reduce the problem of scarcity?

6. Would redistributing incomes from the rich to the poor reduce the overall problem of scarcity?

7. Assume that fracking becomes common across the UK. The result is that supplies of shale gas and oil increase sharply. Trace through the effects of this on the market for oil, gas and the market for other fuels.

8. Give two examples of positive statements about the economy, and two examples of normative ones. Now give two examples that are seemingly positive, but which have normative implications or undertones.

Online resources

Additional case studies on the student website

1.1 **Buddhist economics.** A different perspective on economic problems and economic activity.

1.2 **Green economics.** This examines some of the environmental costs that society faces today. It also looks at the role of economics in analysing these costs and how the problems can be tackled.

1.3 **Global economics.** This examines how macroeconomics and microeconomics apply at the global level and identifies some key issues.

1.4 **The interdependence of markets.** A case study in the operation of markets, examining the effects on a local economy of the discovery of a large coal deposit.

1.5 **Free-market medicine in Russia.** This examines the operating of the fledgling market economy in Russia and the successes and difficulties in moving from a planned to a market economy.

1.6 **Alternative measures of well-being.** This case study takes a preliminary look at how we measure the well-being of society. Should we use output (GDP) per head or some other measure?

Websites relevant to this chapter

Numbers and sections refer to websites listed in the Web Appendix and hotlinked from this book's website at **go.pearson.com/uk/sloman**.

- For news articles relevant to this chapter, see the *Sloman Economics News* site link from MyEconLab or the *Economics News* section on the student website.
- For general economics news sources, see websites in section A of the Web Appendix at the end of the book, and particularly A1–9, 24, 25, 35, 36. See also A39–44 for links to newspapers worldwide.
- For sources of economic data, see sites in section B and particularly B1–5, 21, 33, 34, 38, 47.
- For general sites for students of economics, see sites in section C and particularly C1–10.
- For sites giving links to relevant economics websites, organised by topic, see sites I2, 3, 7, 12, 13, 14, 16.
- For news on the Russian economy (Box 1.5 and Case Study 1.5 on the student website), see sites A14, 15.
- For an excellent site giving details of the lives, works and theories of famous economists from the history of economic thought (including Adam Smith from Box 1.6), see C18.

Foundations of Microeconomics

In the first half of the book, we focus on microeconomics. Despite being 'small economics' – in other words, the economics of the individual parts of the economy, rather than the economy as a whole – it is still concerned with many of the big issues of today. To understand how the economy works at this micro level, we must understand how markets work. This involves an understanding of demand and supply.

In Chapter 2, we look at how demand and supply interact to determine prices (and so allocate resources) in a free-market economy. We will also see just how responsive they are to changing circumstances.

Markets, however, are not always free: governments frequently intervene in markets. In Chapter 3, we look at some of the reasons why governments may choose to reject the free market and examine the methods they use to influence prices, output and allocation.

We look at markets, their efficiency and government intervention in more detail in Parts C and D.

2 Chapter

Supply and Demand

As we saw in Chapter 1, in a free-market economy prices play a key role in transmitting information from buyers to sellers and from sellers to buyers. This chapter examines this 'price mechanism' in more detail.

We examine what determines demand, what determines supply and what the relationship is between demand, supply and price. We see how the price mechanism transmits information both from consumers to producers, and from producers to consumers; and how prices act as incentives – for example, if consumers want more European city breaks, how this increased demand leads to an increase in their price and hence to an incentive for firms to increase their production.

What we will see is the mechanism whereby the free market responds to changes in demand or supply – and responds in a way that balances demand and supply at a position of 'equilibrium'.

But we will also need to see just how much prices and output respond to changes in demand and supply. How much will the demand for music downloads go up if their price comes down? How much will the supply of new houses go up if the price of houses rises? In section 2.4 we develop the concept of elasticity of demand and supply to examine this responsiveness.

Finally, we look at how quickly markets adjust and also examine how people's expectations of price changes affect what actually happens to prices. In particular, we look at speculation – people attempting to gain from anticipated price changes.

The markets we will be examining are highly competitive ones, with many firms competing against each other. In economics we call this **perfect competition**. This is where consumers and producers are too numerous to have any control over prices: they are **price takers.**

In the case of consumers, this means that they have to accept the prices as given for the things that they buy. On most occasions this is true; when you get to the supermarket checkout you cannot start haggling with the checkout operator over the price of a can of beans or a tub of ice cream.

In the case of firms, perfect competition means that producers are small and face too much competition from other firms to be able to raise prices. Take the case of foreign exchange traders selling euros. They have to sell the currency at the current market price. If individually they try to sell at a higher price, no one will buy, since purchasers of currency can get all the euros they want at the market price.

Of course, many firms *do* have the power to choose their prices. This does not mean that they can simply charge whatever they like. They will still have to take account of overall consumer demand and their competitors' prices. Apple, when setting the price of its iPhones, will have to ensure that they remain competitive with those produced by Samsung, Huawei, etc. Nevertheless, most firms have some flexibility in setting their prices: they have a degree of 'market power'.

If this is the case, then why do we study *perfect* markets, where firms are price takers? One reason is that they provide a useful approximation to the real world and give us many insights into how a market economy works. Many markets, such as those in agriculture and finance, do function very similarly to those we shall be describing.

Another is that perfect markets provide an ideal against which to compare the real world, since in perfect markets we see resources being used and allocated efficiently. Economists can therefore use them as a benchmark when comparing the prices, output, profit, etc. in different types of market. For example, will the consumer end up paying higher prices in a market dominated by just a few firms than in one operating under perfect competition? Will Netflix respond to an increase in the demand for streaming services in the same way as a farmer does to an increase in the demand for cauliflowers?

Markets with powerful firms are examined in Chapters 7 and 8. For now we concentrate on price takers.

2.1 DEMAND

The relationship between demand and price

The headlines announce, 'Major crop failures in Brazil and Vietnam: coffee prices soar'. Shortly afterwards you find that coffee prices have increased sharply in the shops. What do you do? You will probably cut back on the amount of coffee you drink. Perhaps you will reduce it from, say, six cups per day to four. Perhaps you will give up drinking coffee altogether.

This is simply an illustration of the general relationship between price and consumption: *when the price of a good rises, the quantity demanded will fall.* This relationship is known as the **law of demand**. There are two reasons for this law:

- People will feel poorer. They will not be able to afford to buy as much of the good with their money. The purchasing power of their income (their *real income*) has fallen. This is called the **income effect** of a price rise.

- The good will now cost more than alternative or 'substitute' goods, and people will switch to these. This is called the **substitution effect** of a price rise.

Similarly, when the price of a good falls, the quantity demanded will rise. People can afford to buy more (the income effect), and they will switch away from consuming alternative goods (the substitution effect).

Therefore, returning to our example of the increase in the price of coffee, we will not be able to afford to buy as much as before, and we will probably drink more tea, cola, fruit juices or even water instead.

Definitions

Perfect competition (preliminary definition) A situation where the consumers and producers of a product are price takers. (There are other features of a perfectly competitive market; these are examined in Chapter 7.)

Price taker A person or firm with no power to be able to influence the market price.

Law of demand The quantity of a good demanded per period of time will fall as price rises and will rise as price falls, other things being equal (*ceteris paribus*).

Income effect The effect of a change in price on quantity demanded arising from the consumer becoming better or worse off as a result of the price change.

Substitution effect The effect of a change in price on quantity demanded arising from the consumer switching to or from alternative (substitute) products.

A word of warning: be careful about the meaning of the words *quantity demanded*. They refer to the amount that consumers are willing and able to purchase at a given price over a given period (e.g. a week, or a month, or a year). They do not refer to what people would simply *like* to consume. You might like to own a luxury yacht, but your demand for luxury yachts will almost certainly be zero at the current price. Quantity demanded may also be different from the quantity actually purchased. A consumer may be willing and able to purchase the good but cannot find a supplier willing to sell at that price.

The demand curve

Consider the hypothetical data in Table 2.1, which shows how many kilograms of potatoes per month would be purchased at various prices.

Columns (2) and (3) show the *demand schedules* for two individuals, Kate and Simon. Column (4) shows the total *market demand schedule*. This is the total demand by all consumers. To obtain the market demand schedule for potatoes, we simply add up the quantities demanded at each price by all consumers: i.e. Kate, Simon and everyone else who demands potatoes. Notice that we are talking about demand *over a period of time* (not at a *point* in time). Thus we could talk about daily demand or weekly demand or annual demand.

> ? Assume that there are 200 consumers in the market. Of these, 100 have schedules like Kate's and 100 have schedules like Simon's. What would be the total market demand schedule for potatoes now?

The demand schedule can be represented graphically as a *demand curve*. Figure 2.1 shows the market demand curve for potatoes corresponding to the schedule in Table 2.1. The price of potatoes is plotted on the vertical axis. The quantity demanded is plotted on the horizontal axis.

Point *E* shows that at a price of 100p per kilo, 100 000 tonnes of potatoes are demanded each month. When the price falls to 80p we move down the curve to point *D*. This shows that the quantity demanded has now risen to 200 000 tonnes per month. Similarly, if the price falls to 60p we move down the curve again to point *C*: 350 000 tonnes are now demanded. The five points on the graph (*A*−*E*) correspond to the figures in columns (1) and (4) of Table 2.1. The graph also enables us to read off the likely quantities demanded at prices other than those in the table.

> ? 1. How much would be demanded at a price of 30p per kilogram?
> 2. Assuming that demand does not change from month to month, plot the annual market demand for potatoes.

Table 2.1	The demand for potatoes (monthly)			
	Price (pence per kg) (1)	**Kate's demand (kg) (2)**	**Simon's demand (kg) (3)**	**Total market demand (tonnes: 000s) (4)**
A	20	28	16	700
B	40	15	11	500
C	60	5	9	350
D	80	1	7	200
E	100	0	6	100

Definitions

Quantity demanded The amount of a good that a consumer is willing and able to buy at a given price over a given period of time.

Demand schedule for an individual A table showing the different quantities of a good that a person is willing and able to buy at various prices over a given period of time.

Market demand schedule A table showing the different total quantities of a good that consumers are willing and able to buy at various prices over a given period of time.

Demand curve A graph showing the relationship between the price of a good and the quantity of the good demanded over a given time period. Price is measured on the vertical axis; quantity demanded is measured on the horizontal axis. A demand curve can be for an individual consumer or group of consumers, or more usually for the whole market.

Figure 2.1 | Market demand curve for potatoes (monthly)
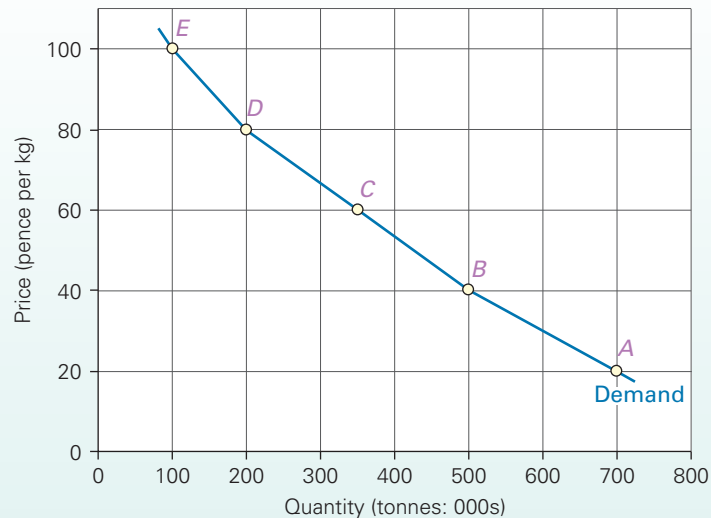
A demand curve could also be drawn for an individual consumer. Like market demand curves, individuals' demand curves generally slope downwards from left to right: they have negative slope. The lower the price of the product, the more a person is likely to buy.

> **?**
> 1. *Draw Kate's and Simon's demand curves for potatoes on one diagram. Note that you will use the same vertical scale as in Figure 2.1, but you will need a quite different horizontal scale.*
> 2. *At what price is their demand the same?*
> 3. *What explanations could there be for the quite different shapes of their two demand curves? (This question is explored in section 3.1 below.)*
> 4. *Assume that Kate and Simon are the only two consumers in the market. Show how it is possible to derive a market demand curve from their individual demand curves.*

Two points should be noted at this stage:

- In textbooks, demand curves (and other curves too) are only occasionally used to plot specific data. More frequently they are used to illustrate general theoretical arguments. In such cases the axes will simply be price and quantity, with the units unspecified.
- The term 'curve' is used even when the graph is a straight line. In fact when using demand curves to illustrate arguments we frequently draw them as straight lines – it's easier.

Other determinants of demand

Price is not the only factor that determines how much of a good people will buy. Demand is also affected by the following.

Tastes. The more desirable people find the good, the more they will demand. Tastes are affected by advertising, by trends and fashion, by observing other consumers, by considerations of health and by the experience of consuming the good on previous occasions. For example, during the lockdowns in 2020 roller-skating became very popular with the impact of influencers such as Oumi Janta. Big increases in the demand for roller skates caused a world-wide shortage.

`TC 1`
`p10`

The number and price of substitute goods (i.e. competitive goods). The higher the price of **substitute goods**, the higher will be the demand for this good as people switch from the substitutes. For example, the price of cigarettes will influence the demand for e-cigarettes. If the price of cigarettes increases, the demand for e-cigarettes will rise.

The number and price of complementary goods. **Complementary goods** are those that are consumed together; cars and petrol, paper and ink cartridges, fish and chips. The higher the price of complementary goods, the fewer of them will be bought and hence the less will be the demand for the good under consideration. For example, the demand for games will depend on the price of games consoles, such as the Sony

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Definitions

Substitute goods A pair of goods which are considered by consumers to be alternatives to each other. As the price of one goes up, the demand for the other rises.

Complementary goods A pair of goods consumed together. As the price of one goes up, the demand for both goods will fall.

PlayStation® and Microsoft box®. If the price of games consoles comes down, so that more are purchased, the demand for games will rise.

Income. As people's incomes rise, their demand for most goods will rise. Such goods are called *normal goods*. There are exceptions to this general rule, however. As people get richer, they spend less on *inferior goods*, such as supermarket 'value' ranges, and switch to better quality goods.

Distribution of income. If national income were redistributed from the poor to the rich, the demand for luxury goods would rise. At the same time, as the poor got poorer they might have to buy more inferior goods; demand for these would rise too.

Expectations of future price changes. If people think that prices are going to rise in the future, they are likely to buy more now before the price does go up.

Movements along and shifts in the demand curve

A demand curve is constructed on the assumption that 'other things remain equal' (*ceteris paribus*). In other words, it is assumed that none of the determinants of demand, other than price, changes. The effect of a change in price is then simply illustrated by a movement along the demand curve: for example, from point B to point D in Figure 2.1 when the price of potatoes rises from 40p to 80p per kilo.

What happens, then, when one of these other determinants does change? The answer is that we have to construct a whole new demand curve: the curve shifts. If a change in one of the other determinants causes demand to rise – say, income rises – the whole curve will shift to the right. This shows that at each price more will be demanded than before. Thus, in Figure 2.2, at a price of P, a quantity of Q_0 was originally demanded. But now, after the increase in demand, Q_1 is demanded. (Note that D_1 is not necessarily parallel to D_0.)

Figure 2.2 An increase in demand
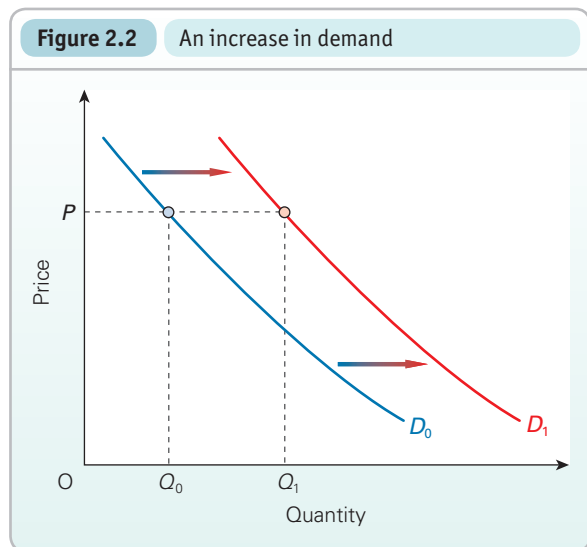
If a change in a determinant other than price causes demand to fall, the whole curve will shift to the left.

To distinguish between shifts in and movements along demand curves, it is usual to distinguish between a change in *demand* and a change in the *quantity demanded*. A shift in the demand curve is referred to as a *change in demand*, whereas a movement along the demand curve as a result of a change in price is referred to as a *change in the quantity demanded*.

> 1. Assume that in Table 2.1 the total market demand for potatoes increases by 20 per cent at each price – due, say, to substantial increases in the prices of bread and rice. Plot the old and the new demand curves for potatoes. Is the new curve parallel to the old one?
> 2. The price of strawberries rises and yet the sales of strawberries increase. Does this mean that the demand curve for strawberries is upward sloping? Explain.

Definitions

Normal good A good whose demand rises as people's incomes rise.

Inferior good A good whose demand falls as people's incomes rise.

Change in demand The term used for a shift in the demand curve. It occurs when a determinant of demand other than price changes.

Change in the quantity demanded The term used for a movement along the demand curve to a new point. It occurs when there is a change in price.

*LOOKING AT THE MATHS

We can represent the relationship between the market demand for a good and the determinants of demand in the form of an equation. This is called a **demand function**. It can be expressed either in general terms or with specific values attached to the determinants.

Simple demand functions

Demand equations are often used to relate quantity demanded to just one determinant. Thus an equation relating quantity demanded to price could be in the form

$$Q_d = a - bP \tag{1}$$

For example, the actual equation might be:

$$Q_d = 10\,000 - 200P \tag{2}$$

From this can be calculated a complete demand schedule or demand curve, as shown in the table and diagram. As price (P) changes, the equation tells us how much the quantity demanded (Q_d) changes.

Demand schedule for equation (2)

P	Q_d
5	9000
10	8000
15	7000
20	6000
25	5000

Demand curve for equation (2)
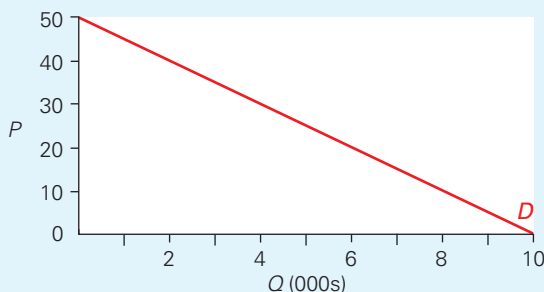
1. *Complete the demand schedule in the table up to a price of 50.*
2. *What is it about equation (2) that makes the demand curve (a) downward sloping; (b) a straight line?*

Definitions

Demand function An equation which shows the mathematical relationship between the quantity demanded of a good and the values of the various determinants of demand.

Regression analysis A statistical technique which allows a functional relationship between two or more variables to be estimated.

Econometrics The science of applying statistical techniques to economic data in order to identify and test economic relationships.

This equation is based on a *ceteris paribus* assumption: it is assumed that all the other determinants of demand remain constant. If one of these other determinants changed, the equation itself would change. There would be a shift in the curve: a change in demand. If the *a* term alone changed, there would be a parallel shift in the curve. If the *b* term changed, the slope of the curve would change.

Simple equations can be used to relate demand to other determinants too. For example, an equation relating quantity demanded to income would be in the form

$$Q_d = a + bY \tag{3}$$

1. *Referring to equation (3), if the term 'a' has a value of −50 000 and the term 'b' a value of 0.001, construct a demand schedule with respect to total income (Y). Do this for incomes between £100 million and £300 million at £50 million intervals.*
2. *Now use this schedule to plot a demand curve with respect to income. Comment on its shape.*

More complex demand functions

In a similar way, we can relate the quantity demanded to two or more determinants. For example, a demand function could be of the form:

$$Q_d = a - bP + cY + dP_s - eP_c \tag{4}$$

This equation says that the quantity demanded (Q_d) will fall as the price of the good (P) rises, will rise as the level of consumer incomes (Y) rises, will rise as the price of a particular substitute (P_s) rises and will fall as the price of a particular complement (P_c) rises, by amounts *b*, *c*, *d* and *e* respectively.

Estimated demand equations

Surveys can be conducted to show how demand depends on each one of a number of determinants, while the rest are held constant. Using statistical techniques called **regression analysis**, a demand equation can be estimated.

For example, assume that it was observed that the demand for butter (measured in 250g units) depended on its price (P_b), the price of margarine (P_m) and total annual consumer incomes (Y). The estimated weekly demand equation may then be something like

$$Q_d = 2\,000\,000 - 50\,000P_b + 20\,000P_m + 0.01Y \tag{5}$$

Thus if the price of butter were 50p, the price of margarine were 35p and consumer incomes were £200 million, and if P_b and P_m were measured in pence and Y was measured in pounds, then the demand for butter would be 2 200 000 units. This is calculated as follows:

$$\begin{aligned}
Q_d &= 2\,000\,000 - (50\,000 \times 50) + (20\,000 \times 35) \\
&\quad + (0.01 \times 200\,000\,000) \\
&= 2\,000\,000 - 2\,500\,000 + 700\,000 + 2\,000\,000 \\
&= 2\,200\,000
\end{aligned}$$

The branch of economics that applies statistical techniques to economic data is known as **econometrics**. Econometrics is beyond the scope of this book. It is worth noting, however, that econometrics, like other branches of statistics, cannot produce equations and graphs that allow totally reliable predictions to be made. The data on which the equations are based are often incomplete or unreliable, and the underlying relationships on which they are based (often ones of human behaviour) may well change over time.

Section summary

1. When the price of a good rises, the quantity demanded per period of time will fall. This is known as the 'law of demand'. It applies both to individuals' demand and to the whole market demand.

2. The law of demand is explained by the income and substitution effects of a price change.

3. The relationship between price and quantity demanded per period of time can be shown in a table (or 'schedule') or as a graph. On the graph, price is plotted on the vertical axis and quantity demanded per period of time on the horizontal axis. The resulting demand curve is downward sloping (negatively sloped).

4. Other determinants of demand include tastes, the number and price of substitute goods, the number and price of complementary goods, income, distribution of income and expectations of future price changes.

5. If price changes, the effect is shown by a movement along the demand curve. We call this effect 'a change in the quantity demanded'.

6. If any other determinant of demand changes, the whole curve will shift. We call this effect 'a change in demand'. A rightward shift represents an increase in demand; a leftward shift represents a decrease in demand.

*7. The relationship between the quantity demanded and the various determinants of demand (including price) can be expressed as an equation.

2.2 SUPPLY

Supply and price

Imagine you are a farmer deciding what to do with your land. Part of your land is in a fertile valley, while part is on a hillside where the soil is poor. Perhaps, then, you will consider growing vegetables in the valley and keeping sheep on the hillside.

Your decision will depend to a large extent on the price that various vegetables will fetch in the market and the price you can expect to get for meat and wool. As far as the valley is concerned, you will plant the vegetables that give the best return. If, for example, the price of potatoes is high, you might use a lot of the valley for growing potatoes. If the price gets higher, you may well use the whole of the valley. If the price is very high indeed, you may even consider growing potatoes on the hillside, even though the yield per acre is much lower there.

In other words, the higher the price of a particular farm output, the more land will be devoted to it. This illustrates the general relationship between supply and price: *when the price of a good rises, the quantity supplied will also rise.* There are three reasons for this:

- As firms supply more, they are likely to find that beyond a certain level of output, costs rise more and more rapidly. In the case of the farm just considered, if more and more potatoes are grown, then the land which is less suitable for potato cultivation has to be used. This raises the cost of producing extra potatoes. It is the same for manufacturers. Beyond a certain level of output, costs are likely to rise rapidly as workers have to be paid overtime and as machines approach capacity working. If higher output involves higher costs of producing each unit, producers will need to get a higher price if they are to be persuaded to produce extra output.

- The higher the price of the good, the more profitable it becomes to produce. Firms will thus be encouraged to produce more of it by switching from producing less profitable goods.

- Given time, if the price of a good remains high, new producers will be encouraged to enter the industry. Total market supply thus rises.

The first two determinants affect supply in the short run. The third affects supply in the long run. We distinguish between short-run and long-run supply in section 2.5 on page 69.

The supply curve

The amount that producers would like to supply at various prices can be shown in a *supply schedule*. Table 2.2 shows a monthly supply schedule for potatoes, both for an individual farmer (farmer X) and for all farmers together (the whole market). (Note, however, that the amount they supply at a given price may not be the same as the amount they actually sell. Some supply may remain unsold.)

Definition

Supply schedule A table showing the different quantities of a good that producers are willing and able to supply at various prices over a given time period. A supply schedule can be for an individual producer or group of producers, or for all producers (the market supply schedule).

Table 2.2	The supply of potatoes (monthly)		
	Price of potatoes (pence per kg)	Farmer X's supply (tonnes)	Total market supply (tonnes: 000s)
a	20	50	100
b	40	70	200
c	60	100	350
d	80	120	530
e	100	130	700

The supply schedule can be represented graphically as a *supply curve*. A supply curve may be an individual firm's supply curve or a market curve (i.e. that of the whole industry).

Figure 2.3 shows the *market* supply curve of potatoes. As with demand curves, price is plotted on the vertical axis and quantity on the horizontal axis. Each of the points *a–e* corresponds to a figure in Table 2.2. Thus, for example, a price rise from 60p per kilogram to 80p per kilogram will cause a movement along the supply curve from point *c* to point *d*: total market supply will rise from 350 000 tonnes per month to 530 000 tonnes per month.

> **?**
> 1. How much would be supplied at a price of 70p per kilo?
> 2. Draw a supply curve for farmer X. Are the axes drawn to the same scale as in Figure 2.3?

Not all supply curves will be upward sloping (positively sloped). Sometimes they will be vertical, or horizontal or even downward sloping. This will depend largely on the time period over which firms' response to price changes is considered. This question is examined in the section on the elasticity of supply (see section 2.4 below) and in more detail in Chapters 6 and 7.

Other determinants of supply

Like demand, supply is not simply determined by price. The other determinants of supply are as follows.

The costs of production. The higher the costs of production, the less profit will be made at any price. As costs rise, firms will cut back on production, probably switching to alternative products whose costs have not risen so much.

The main reasons for a change in costs are as follows:

- Change in input prices: costs of production will rise if wages, raw material prices, rents, interest rates or any other input prices rise.
- Change in technology: technological advances can fundamentally alter the costs of production. Consider, for example, how the microchip revolution has changed production methods and information handling in virtually every industry in the world.
- Organisational changes: various cost savings can be made in many firms by reorganising production.
- Government policy: costs will be lowered by government subsidies and raised by various taxes. Government regulation may also increase costs; examples include minimum wages and obligations for employers to provide and contribute to employee pensions.

Definition

Supply curve A graph showing the relationship between the price of a good and the quantity of the good supplied over a given period of time.

Figure 2.3	Market supply curve of potatoes (monthly)
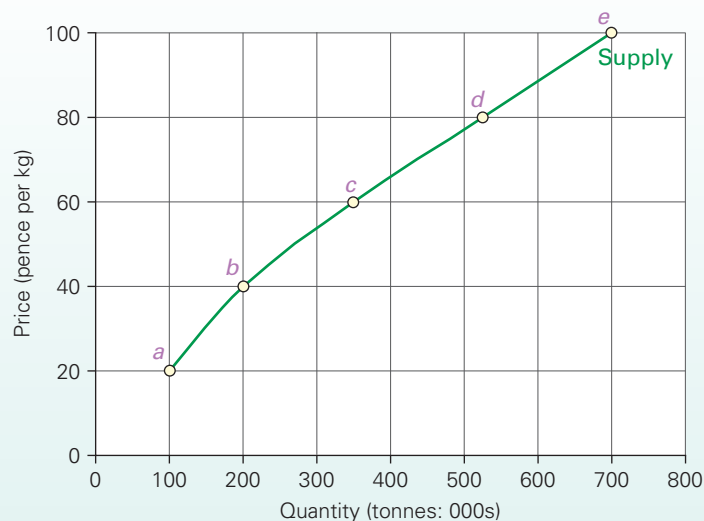
The profitability of alternative products (substitutes in supply). If a product which is a **substitute in supply** becomes more profitable to supply than before, producers are likely to switch from the first good to this alternative. Supply of the first good falls. Other goods are likely to become more profitable if their prices rise and/or their costs of production fall. For example, during 2020 many gin distilleries switched to producing hand sanitiser.

The profitability of goods in joint supply. Sometimes when one good is produced, another good is also produced at the same time. These are said to be **goods in joint supply**. An example is the refining of crude oil to produce petrol. Other grade fuels will be produced as well, such as diesel and paraffin. If more petrol is produced due to a rise in demand and hence its price, then the supply of these other fuels will rise too.

Nature, 'random shocks' and other unpredictable events. In this category we would include the weather and diseases affecting farm output, wars affecting the supply of imported raw materials, the breakdown of machinery, industrial disputes, earthquakes, floods and fire, etc. Research suggest that one third of the variation in the annual harvests of maize wheat and rice is caused by changes in the weather (temperature and rainfall). In one specific example, unexpected frosts in Brazil in July 2019 put upward pressure on coffee prices over fears it would have a negative impact on harvests.

The aims of producers. A profit-maximising firm will supply a different quantity from a firm that has a different aim, such as maximising sales. For most of the time we shall assume that firms are profit maximisers. In Chapter 9, however, we consider alternative aims.

Expectations of future price changes. If suppliers believe that the prices of the goods they produce will rise in the future, they may temporarily reduce the amount they sell today. They may build up their stocks and only release them on to the market when the price does rise. At the same time, they may install new machines or take on more labour, so that they can be ready to supply more when the price has risen.

The number of suppliers. If new firms enter the market, supply is likely to increase.

? *By referring to each of the above determinants of supply, identify what would cause (a) the supply of potatoes to fall and (b) the supply of leather to rise.*

Movements along and shifts in the supply curve

The principle here is the same as with demand curves. The effect of a change in price is illustrated by a movement along the supply curve: for example, from point *d* to point *e* in Figure 2.3 when price rises from 80p to 100p. Quantity supplied rises from 530 000 to 700 000 tonnes per month.

If any other determinant of supply changes, the whole supply curve will shift. A rightward shift illustrates an

Figure 2.4   Shifts in the supply curve
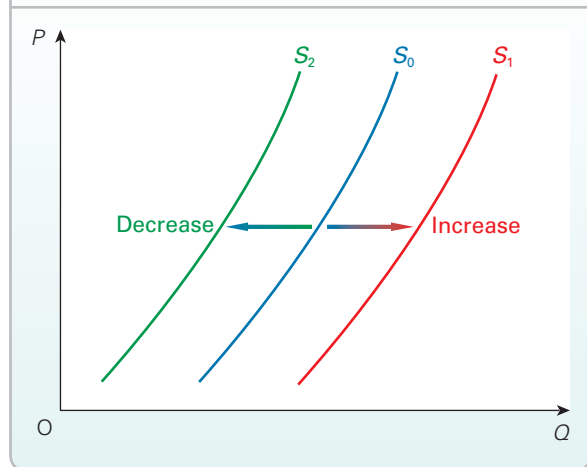
increase in supply. A leftward shift illustrates a decrease in supply. Thus in Figure 2.4, if the original curve is S_0, the curve S_1 represents an increase in supply (more is supplied at each price), whereas the curve S_2 represents a decrease in supply (less is supplied at each price).

A movement along a supply curve is often referred to as a **change in the quantity supplied**, whereas a shift in the supply curve is simply referred to as a **change in supply**.

? *This question is concerned with the supply of oil for central heating. In each case consider whether there is a movement along the supply curve (and in which direction) or a shift in it (and whether left or right).*
(a) New oil fields start up in production.
(b) The demand for central heating rises.
(c) The price of gas falls.
(d) Oil companies anticipate an upsurge in demand for central-heating oil.
(e) The demand for petrol rises.
(f) New technology decreases the costs of oil refining.
(g) All oil products become more expensive.

Definitions

Substitutes in supply These are two goods where an increased production of one means diverting resources away from producing the other.

Joint supply goods These are two goods where the production of more of one leads to the production of more of the other.

Change in the quantity supplied The term used for a movement along the supply curve to a new point. It occurs when there is a change in price.

Change in supply The term used for a shift in the supply curve. It occurs when a determinant other than price changes.

*LOOKING AT THE MATHS

Using survey data and regression analysis, equations can be estimated relating supply to some of its determinants. Note that not all determinants can be easily quantified (e.g. nature and the aims of firms), and they may thus be left out of the equation.

The simplest form of supply equation relates supply to just one determinant. Thus a function relating supply to price would be of the form

$$Q_s = c + dP \qquad (1)$$

Using regression analysis, values can be estimated for c and d. Thus an actual supply equation might be something like

$$Q_s = 500 + 1000P \qquad (2)$$

1. *If P was originally measured in pounds, what would happen to the value of the d term in equation (2) if P were now measured in pence?*
2. *Draw the schedule (table) and graph for equation (2) for prices from £1 to £10. What is it in the equation that determines the slope of the supply 'curve'?*

If any determinant other than price changed, a new equation would result. For example, if costs of production fell, the equation might then be

$$Q_s = 1000 + 1500P \qquad (3)$$

More complex supply equations would relate supply to more than one determinant. For example:

$$Q_s = 200 + 80P - 20a_1 - 15a_2 + 30j \qquad (4)$$

where P is the price of the good, a_1 and a_2 are the profitabilities of two alternative goods that could be supplied instead, and j is the profitability of a good in joint supply.

Explain why the P and j terms have a positive sign, whereas the a_1 and a_2 terms have a negative sign.

Section summary

1. When the price of a good rises, the quantity supplied per period of time will usually also rise. This applies both to individual producers' supply and to the whole market supply.

2. There are two reasons in the short run why a higher price encourages producers to supply more: (a) they are now willing to incur the higher costs per unit associated with producing more; (b) they will switch to producing this product and away from products that are now less profitable. In the long run, there is a third reason: new producers will be attracted into the market.

3. The relationship between price and quantity supplied per period of time can be shown in a table (or schedule) or as a graph. As with a demand curve, price is plotted on the vertical axis and quantity per period of time on the horizontal axis. The resulting supply curve is upward sloping (positively sloped).

4. Other determinants of supply include the costs of production, the profitability of alternative products, the profitability of goods in joint supply, random shocks and expectations of future price changes.

5. If price changes, the effect is shown by a movement along the supply curve. We call this effect 'a change in the quantity supplied'.

6. If any determinant *other* than price changes, the effect is shown by a shift in the whole supply curve. We call this effect 'a change in supply'. A rightward shift represents an increase in supply; a leftward shift represents a decrease in supply.

*7. The relationship between the quantity supplied and the various determinants of supply can be expressed in the form of an equation.

2.3 PRICE AND OUTPUT DETERMINATION

Equilibrium price and output

We can now combine our analysis of demand and supply. This will show how the actual price of a product and the actual quantity bought and sold are determined in a free and competitive market.

Let us return to the example of the market demand and market supply of potatoes, and use the data from Tables 2.1 and 2.2. These figures are given again in Table 2.3.

What will be the actual price and output? If the price started at 20p per kilogram, demand would exceed supply by 600 000 tonnes ($A - a$). Consumers would be unable to obtain all they wanted and would thus be willing to pay a higher price. Producers, unable or unwilling to supply enough to meet the demand, will be only too happy to accept a higher price. The effect of the shortage, then, will be to drive up the price. The same would happen at a price of 40p per kilogram. There would still be a shortage; price would still rise. But as the price rises, the quantity demanded falls and the quantity supplied rises. The shortage is progressively eliminated.

Table 2.3	The market demand and supply of potatoes (monthly)	
Price of potatoes (pence per kg)	**Total market demand (tonnes: 000s)**	**Total market supply (tonnes: 000s)**
20	700 (A)	100 (a)
40	500 (B)	200 (b)
60	350 (C)	350 (c)
80	200 (D)	530 (d)
100	100 (E)	700 (e)

Explain the process by which the price of houses would rise if there were a shortage.

What would happen if the price of potatoes started at a much higher level: say, at 100p per kilogram? In this case supply would exceed demand by 600 000 tonnes ($e - E$). The effect of this surplus would be to drive the price down as farmers competed against each other to sell their excess supplies. The same would happen at a price of 80p per kilogram. There would still be a surplus; price would still fall.

In fact, only one price is sustainable – the price where demand equals supply: namely, 60p per kilogram, where both demand and supply are 350 000 tonnes. When supply matches demand the market is said to **clear**. There is no shortage and no surplus.

TC 4
p45

As we have already seen in section 1.2, the price where demand equals supply is called the *equilibrium price* and we return to this in more detail in Threshold Concept 4. In Table 2.3, if the price starts at anything other than 60p per kilogram, it will tend to move towards 60p. The equilibrium price is the only price at which producers' and consumers' wishes

are mutually reconciled: where the producers' plans to supply exactly match the consumers' plans to buy.

KEY IDEA 8

Equilibrium is the point where conflicting interests are balanced. Only at this point is the amount that demanders are willing to purchase the same as the amount that suppliers are willing to supply. It is a point that will be automatically reached in a free market through the operation of the price mechanism.

Demand and supply curves

The determination of equilibrium price and output can be shown using demand and supply curves. Equilibrium is where the two curves intersect.

Figure 2.5 shows the demand and supply curves of potatoes corresponding to the data in Table 2.3. Equilibrium price is P_e (60p) and equilibrium quantity is Q_e (350 000 tonnes).

At any price above 60p, there would be a surplus. Thus at 80p there is a surplus of 330 000 tonnes ($d - D$). More is supplied than consumers are willing and able to purchase at that price. Thus a price of 80p fails to clear the market. Price will fall to the equilibrium price of 60p. As it does so, there will be a movement along the demand curve from point D to point C, and a movement along the supply curve from point d to point c.

At any price below 60p, there would be a shortage. Thus at 40p there is a shortage of 300 000 tonnes ($B - b$).

Definition

Market clearing A market clears when supply matches demand, leaving no shortage or surplus.

Figure 2.5	The determination of market equilibrium (potatoes: monthly)
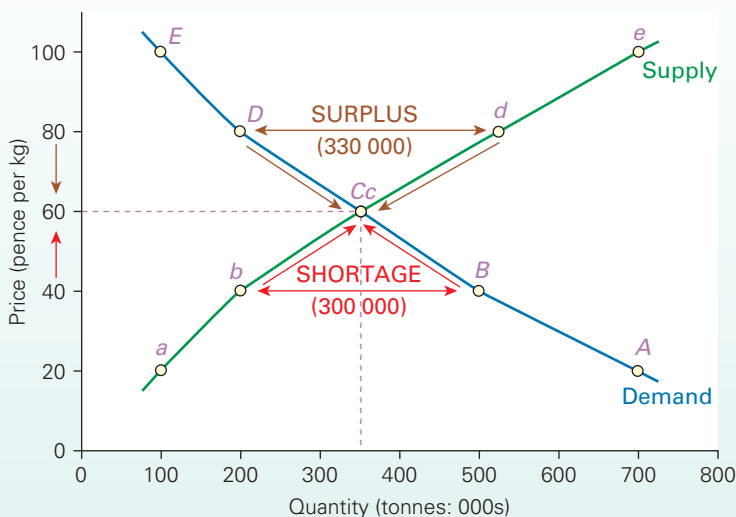
Price will rise to 60p. This will cause a movement along the supply curve from point *b* to point *c* and along the demand curve from point *B* to point *C*.

Point *Cc* is the equilibrium: where demand equals supply.

Movement to a new equilibrium

KI5
p21

The equilibrium price will remain unchanged only so long as the demand and supply curves remain unchanged. If either of the curves shifts, a new equilibrium will be formed.

A change in demand

If one of the determinants of demand changes (other than price), the whole demand curve will shift. This will lead to a movement *along* the *supply* curve to the new intersection point.

For example, in Figure 2.6, if a rise in consumer incomes led to the demand curve shifting to D_2, there would be a

Figure 2.6   Effect of a shift in the demand curve
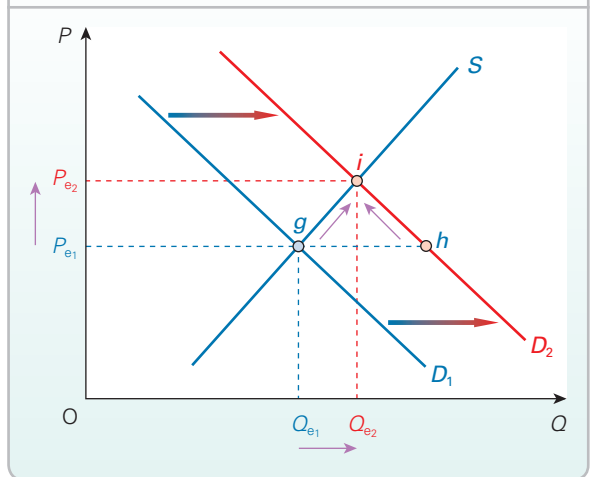
| **THRESHOLD CONCEPT 4** | **MARKETS EQUATE DEMAND AND SUPPLY** |

'Let the market decide.' 'Market forces will dictate.' 'You can't buck the market.'

These sayings about the market emphasise the power of market forces and how they affect our lives. Markets affect the prices of the things we buy and the incomes we earn. Even governments find it difficult to control many key markets. Governments might not like it when stock market prices plummet or when oil prices soar, but there is little they can do about it.

In many ways a market is like a democracy. People, by choosing to buy goods, are voting for them to be produced. Firms finding 'a market' for their products are happy to oblige and produce them. The way it works is simple. If people want more of a product, they buy more and thereby 'cast their votes' (i.e. their money) in favour of more being produced. The resulting shortage drives up the price, which gives firms the incentive to produce more of the product. In other words, firms are doing what consumers want – not because of any 'love' for consumers, or because they are being told to produce more by the government, but because it is in their own self-interest. They supply more because the higher price has made it profitable to do so.

This is a *threshold concept* because to understand market forces – the forces of demand and supply – is to go straight to the heart of a market economy. And in this process, prices are the key. It is changes in price that balance demand and supply. If demand exceeds supply, price will rise. This will choke off some of the demand and encourage more supply until demand equals supply – until an equilibrium has been reached. If supply exceeds demand, price will fall. This will discourage firms from supplying so much and encourage consumers to buy more, until, once more, an equilibrium has been reached.

In this process, markets act like an 'invisible hand' – a term coined by the famous economist Adam Smith (see Box 1.6 on page 24). Market prices guide both producers to respond to consumer demand and consumers to respond to changes in producer supply.

In many circumstances, markets bring outcomes that people want. As we have seen, if consumers want more, then market forces will lead to more being produced. Sometimes, however, market forces can bring adverse effects. We explore these in various parts of the book. It is important, at this stage, however, to recognise that markets are rarely perfect. Market failures, from pollution to the domination of our lives by big business, are very real. Understanding this brings us to Threshold Concept 7 (see page 79).

Partial equilibrium

The type of equilibrium we will be examining for the next few chapters is known as 'partial equilibrium'. It is partial because what we are doing is examining just one tiny bit of the economy at a time: just one market (e.g. that for eggs). It is even partial within the market for eggs because we are assuming that price is the *only* thing that changes to balance demand and supply: that nothing else changes. In other words, when we refer to equilibrium price and quantity, we are assuming that all the other determinants of both demand and supply are held constant.

If another determinant of demand or supply *does* change, there would then be a new partial equilibrium as price adjusts and both demanders and suppliers respond. For example, if a health scare connected with egg consumption causes the demand for eggs to fall, the resulting surplus will lead to a fall in the equilibrium price and quantity.

> 1. *If there is a shortage of certain skilled workers in the economy, how will market forces lead to an elimination of the skills shortage?*
> 2. *If consumers want more of a product, is it always desirable that market forces result in more being produced?*

shortage of $h–g$ at the original price P_{e_1}. This would cause price to rise to the new equilibrium P_{e_2}. As it did so, there would be a movement along the supply curve from point g to point i, and along the new demand curve (D_2) from point h to point i. Equilibrium quantity would rise from Q_{e_1} to Q_{e_2}.

The effect of the shift in demand, therefore, has been a movement *along* the supply curve from the old equilibrium to the new: from point g to point i.

> *What would happen to price and quantity if the demand curve shifted to the left? Draw a diagram to illustrate your answer.*

A change in supply

Likewise, if one of the determinants of supply changes (other than price), the whole supply curve will shift. This will lead to a movement *along* the *demand* curve to the new intersection point.

For example, in Figure 2.7, if costs of production rose, the supply curve would shift to the left: to S_2. There would be a shortage of $g − j$ at the old price of P_{e_1}. Price would rise from P_{e_1} to P_{e_3}. Quantity would fall from Q_{e_1} to Q_{e_3}. In other words, there would be a movement along the demand curve from point g to point k, and along the new supply curve (S_2) from point j to point k.

To summarise: a shift in one curve leads to a movement along the other curve to the new intersection point.

Sometimes a number of determinants might change. This might lead to a shift in *both* curves. When this happens, equilibrium simply moves from the point where the old curves intersected to the point where the new ones intersect.

> *What will happen to the equilibrium price and quantity of butter in each of the following cases? You should state whether demand or supply (or both) have shifted and in which direction. (In each case assume* ceteris paribus.*)*

Figure 2.7   Effect of a shift in the supply curve
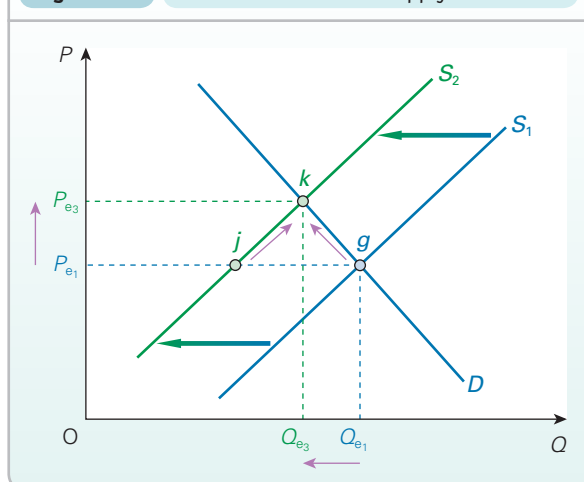
(a) A rise in the price of non-dairy spread.
(b) A rise in the demand for cream.
(c) A rise in the price of bread.
(d) A rise in the demand for bread.
(e) An expected rise in the price of butter in the near future.
(f) A tax on butter production.
(g) The invention of a new, but expensive, process for removing all saturated fat from butter, alongside the passing of a law which states that all butter producers must use this process.

Incentives in markets

Throughout this chapter we have seen that people and firms respond to incentives. In all cases of changes in demand and supply, the resulting changes in price act as both signals and incentives. This is Threshold Concept 5.

*LOOKING AT THE MATHS

We saw on pages 39 and 43 how demand and supply curves can be represented by equations. Assume that the equations for the supply and demand curves in a particular market are as follows:

$$Q_d = a − bP \tag{1}$$
$$Q_s = c + dP \tag{2}$$

We can find the market equilibrium price by setting the two equations equal to each other, since, in equilibrium, the quantity supplied (Q_S) equals the quantity demanded (Q_D). Thus:

$$c + dP = a − bP$$

Subtracting c from and adding bP to both sides gives:

$$dP + bP = a − c$$
$$\therefore (d + b)P = a − c$$
$$\therefore P = \frac{a − c}{d + b} \tag{3}$$

We can then solve for equilibrium quantity (Q_e) by substituting equation (3) in either equation (1) or (2) (since $Q_D = Q_S$). Thus, from equation (1):

$$Q_e = a − b\left(\frac{a − c}{d + b}\right)$$
$$= \frac{a(d + b) − b(a − c)}{d + b}$$
$$= \frac{ad + ab − ba + bc}{d + b} = \frac{ad + bc}{d + b} \tag{4}$$

or, from equation (2):

$$Q_e = c + d\left(\frac{a − c}{d + b}\right)$$
$$= \frac{cd + cb + da − dc}{d + b} = \frac{cb + da}{d + b} \tag{5}$$

Thus:

$$Q_e = \frac{ad + bc}{d + b} \text{ (equation (4))} = \frac{cb + da}{d + b} \text{ (equation(5))}$$

A worked example is given in Maths Case 2.1 on the student website.

*Identifying the position of demand and supply curves

Both demand and supply depend on price, and yet their interaction determines price. For this reason it is difficult to identify just what is going on when price and quantity change, and to identify just what the demand and supply curves look like.

Let us say that we want to identify the demand curve for good X. We observe that when the price was 20p, 1000 units were purchased. At a later date the price has risen to 30p and 800 units are now purchased. What can we conclude from this about the demand curve? The answer is that without further information we can conclude very little. Consider Figures 2.8 and 2.9. Both are consistent with the facts.

In Figure 2.8 the demand curve has not shifted. The rise in price and the fall in sales are due entirely to a shift in the supply curve. The movement from point *a* to point *b* is thus a movement along the demand curve. If we can be certain that the demand curve has not shifted, then the evidence allows us to identify its position (or, at least, two points on it).

In Figure 2.9, however, not only has the supply curve shifted, but so also has the demand curve. Let us assume that people's tastes for the product have increased. In this case a movement from *a* to *b* does *not* trace out the demand curve.

We cannot derive the demand curve(s) from the evidence of price and quantity alone.

The problem is that when the supply curve shifts, we often cannot know whether or not the demand curve has shifted, and if so by how much. How would we know, for example, just how much people's tastes have changed?

The problem works the other way round too. It is difficult to identify a supply curve when the demand curve shifts. Is the change in price and quantity entirely due to the shift in the demand curve, or has the supply curve shifted too?

This is known as the *identification problem*. It is difficult to identify just what is causing the change in price and quantity.

Definition

Identification problem The problem of identifying the relationship between two variables (e.g. price and quantity demanded) from the evidence when it is not known whether or how the variables have been affected by other determinants. For example, it is difficult to identify the shape of a demand curve simply by observing price and quantity when it is not known whether changes in other determinants have shifted the demand curve.

Figure 2.8 Problems in identifying the position and shape of the demand curve: shift in supply curve alone
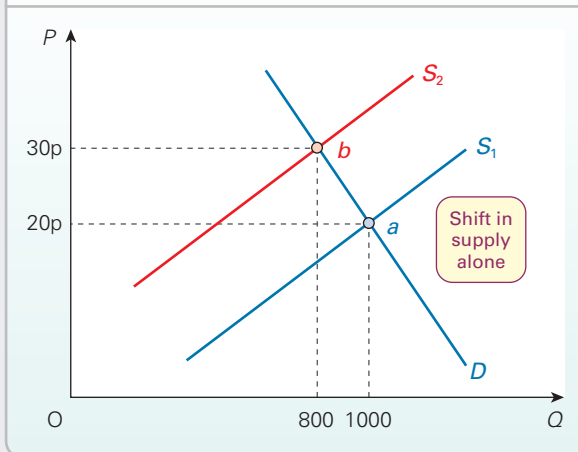
Figure 2.9 Problems in identifying the position and shape of the demand curve: shift in supply *and* demand curves
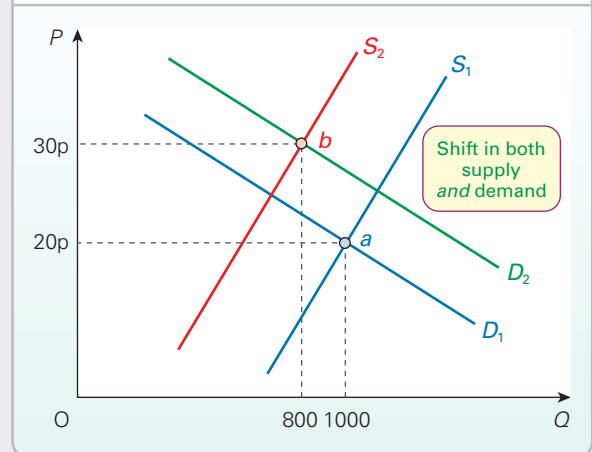
THRESHOLD CONCEPT 5   PEOPLE RESPOND TO INCENTIVES

So it's important to get them right

What gets you out of bed and into an economics lecture on time? What helps decide whether you wear a cycle helmet when out for a bike ride? What motivates a firm to invest in extra training for its workforce? Incentives drive the way individuals and businesses behave – even when we don't see that the incentive exists.

Financial and non-financial incentives

When there is a shortage of a good, its market price will rise, the opportunity cost goes up and there is an incentive for us to consume less. Similarly there is an incentive for firms to produce more. After all, the good is now more profitable to produce. This is an example of a financial incentive, for both buyers and producers. Other financial incentives include wages (i.e. being paid to work), bursaries for students and tax relief on investment for businesses.

But when we look at what motivates people making decisions, we see that non-financial incentives also play an important role. When we give to charity, support a football team, buy presents for our family or decide to run across a busy road rather than use a crossing, we are reacting to non-financial incentives.

Do incentives lead to desirable outcomes?

Let us return to the example of a shortage of a good, leading to a price rise. The resulting incentives could be seen as desirable, the shortage is eliminated and consumers are able to buy more of a good where demand initially exceeds supply.

However, there are plenty of instances where incentives may be 'perverse'. In other words, they could have undesirable effects. For example, if a particular course or module on your degree is assessed by two pieces of coursework, this may act as an incentive for you to concentrate solely on these two pieces and do little work on the rest of the syllabus.

There are plenty of other examples where incentives can be perverse. Making cars safer may encourage people to drive faster. Increasing top rates of income tax may encourage high earners to work less or to evade paying taxes by not declaring income – tax revenues may end up falling.

If an economic system is to work well, it is important, therefore, that the incentives are appropriate and do not bring about undesirable

BOX 2.1   UK HOUSE PRICES

The housing market is very important to consumers, firms and government in the UK. Households spend more on housing as a proportion of their income than any other good or service. Higher house prices tend to increase consumer confidence, leading to higher levels of spending and economic growth. Banks may also feel more confident about lending money to both consumers and firms. If house prices fall, the opposite is true. It is therefore not surprising that so many people take such a keen interest in both house prices and the outlook for the market.

The chart shows what happened to house prices in the period 1984 to the first quarter of 2021.[1] It clearly illustrates the volatility of the market. For example, in the late 1980s there was a boom, with prices doubling between 1984 and 1989. By the end of 1988, prices were rising at an astonishing annual rate of 34 per cent.

The boom came to an end in late 1989 and between 1990 and 1995, house prices fell by 12.2 per cent, causing many households to move into 'negative equity'. This is where the size of a household's mortgage is greater than the value of their house, meaning that if they sold their house, they would still owe money. Many people during this period, therefore, found that they were unable to move house.

In the latter part of the 1990s the housing market started to recover. This then turned into another boom, with house prices rising at an annual rate of 26 per cent at the peak (in the 12 months to January 2003). This boom came to an abrupt

end in 2007–8 with the financial crisis. In 2009, prices fell by 19 per cent and then remained flat for several years, mirroring the lack of growth in the economy.

Prices started to rise again in late 2013 and by the first quarter of 2016, annual house price inflation had reached 10 per cent.

The result of the EU Referendum led to slower growth in prices until the decisive general election result in 2019. This resulted in house price growth accelerating for a couple of months before the impact of the COVID-19 pandemic. Quarterly house prices fell between March and April 2020 following the first national lockdown as people were advised not to move house during this period. With the easing of lockdown restrictions, prices rose more sharply in the second half of 2020 and reached an annual growth rate of 7.6 per cent in November.

The determinants of house prices

Changes in demand and supply determine house prices. If demand rises (i.e. shifts to the right) or if supply falls (i.e. shifts to the left), the equilibrium price of houses will rise. Similarly, if demand falls or supply rises, the equilibrium price will fall. Demand tends to determine price volatility in the short term while supply has a greater impact in the long run.

So what factors in the demand function for housing caused prices to rise so rapidly in periods such as the 1980s, 1997–2007, 2013–16 and the latter half of 2020 and into 2021? Why did they fall in the early 1990s and again from 2008 to 2013? What are the longer-run trends in demand?

1 There are four widely quoted measures of house prices – Nationwide, Halifax, Rightmove and the official House Price Index (HPI).

side effects. This is a *threshold concept* because virtually every action taken by households or firms is influenced by incentives. We need to understand just what the incentives are, what their effects are likely to be, and how the incentives could be improved.

We can see the outcome of inappropriate incentives, when we look at what happened in the former Soviet Union in the days of central planning. The targets given to factory managers (see Box 1.5 on pages 22–3) were often inappropriate. For example, if targets were specified in tonnes, the incentive was to produce heavy products. Soviet furniture and cooking utensils tended to be very heavy! If targets were set in area (e.g. sheet glass), then the incentive was to produce thin products. If targets were set simply in terms of number of units, then the incentive was to produce shoddy products.

Despite the lessons that should have been learnt from the failures of Soviet planning, we still see a lack of real understanding of incentives and the role they can play. If banks are told to increase the amount of financial capital they hold, they may cut down on lending to small businesses. If a university's quality is measured by how many first- and upper second-class degrees it awards, then

there is an incentive to make it easier for students to get high marks.

We will examine the role of incentives in more detail later in the book, particularly when we look at behavioural economics. One crucial incentive is that of profit. In a competitive environment, firms striving for increased profit may result in better products and a lower price for consumers as firms seek to undercut each other. In other cases, however, firms may be able to make bigger profits by controlling the market and keeping competitors out or by colluding with them. Here the profit incentive has a perverse effect: it leads to higher prices for consumers and less choice.

1. *Give two other examples of perverse incentives. How could the incentives be improved?*
2. *Suppose that the kitchen is very untidy – what are the incentives for you to address this? What incentives could you use to get someone else to do it for you?*
3. *Many students undertake voluntary work while at university. What do think the incentives are for this? Identify any perverse incentives associated with volunteering and how they could be addressed.*

UK house price inflation (annual %, adjusted quarterly)
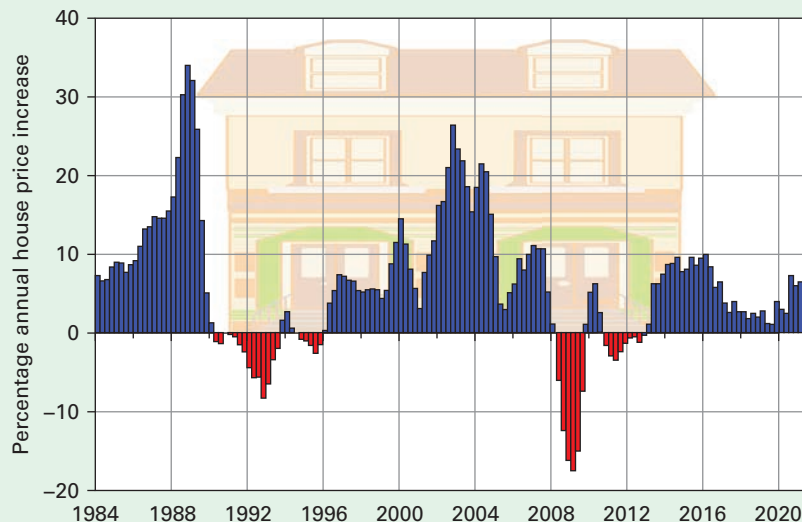
Source: Based on data in *Halifax House Price Index*, Lloyds Banking Group, www.halifax.co.uk/assets/pdf/sep-2021-halifax-house-price-index.pdf

Incomes (actual and anticipated).   The second half of the 1980s, 1996–2007 and 2013–16 were periods of rising incomes. Many people wanted to spend much of their extra income on housing – either as first-time buyers or moving to a better property. They were confident their incomes would continue to grow and were prepared to borrow as much as they could against their current incomes, assuming that their mortgage payments would become more affordable over time.

The early 1990s and late 2000s, by contrast, were periods of recession or low growth, with rising unemployment

(continued)

and flat or falling incomes. People were less confident about their ability to afford large mortgages. With faster growth in incomes from 2013, house prices rose. However, as income growth stalled in 2017 and with uncertainty about the terms of Brexit, so house price inflation slowed between 2017 and 2019.

With falling incomes and rising unemployment during the COVID-19 crisis, many people expected house prices to fall throughout 2020. However, whereas national income fell by 15 per cent in the second quarter of 2020, there was only a 3.3 per cent fall in household disposable income. The impact of the Coronavirus Job Retention Scheme and the Self-Employment Income Support Scheme helps to explain this difference. There were also sharp falls in household consumption expenditure, such as on commuting, restaurants and hotels. This freed up income that people could choose to spend on housing. The impact of the pandemic on people's economic prospects also varied significantly. Poorer families were far more likely to experience falls in income and savings than middle- and high-income households.

The number of households. Social and demographic changes have resulted in a sharp increase in the number of households over the past 40 years. This has had a longer-run impact on the demand for housing. For example, in 1981, there were 20.2 million households in Great Britain; by 2020 this had increased to 27.8 million. Reasons include more lone parents, increased life expectancy and flows of workers from abroad.

The cost of mortgages. During the second half of the 1980s, mortgage interest rates were generally falling. Although they were still high compared with rates today, in real terms they were negative. In other words, they were lower than the rate of house price inflation.

In 1989, however, this trend went into reverse. Mortgage interest rates started rising. Many people found it difficult to maintain their existing payments, let alone take on a larger mortgage. From 1996 to 2003 mortgage rates generally fell, once more fuelling the demand for houses. Even with gently rising interest rates from 2003 to 2007, mortgages were still relatively affordable. Between 2009 and 2021, interest rates remained at an all-time low because of the uncertainty caused by (a) the slow recovery from the financial crisis, (b) the impact of the EU referendum result and (c) the COVID-19 crisis.

The availability of mortgages. In the late 1980s, mortgages became more readily available for two reasons. First, banks and building societies were prepared to offer an increasing number of high loan-to-value (LTV) mortgages. For example, a 95 per cent LTV mortgage is one where the buyer only has to make a 5 per cent deposit. Secondly, lenders were more willing to grant mortgages of up to 3.5 times a person's annual income (compared with 2.5 times in the early 1980s).

With the recession in the early 1990s, banks and building societies became much more cautious. The number of high LTV mortgages fell because of concerns that falling house prices, rising unemployment and negative equity would lead to more borrowers defaulting on payments.

With the recovery of the economy in the mid-1990s and with increased competition between lenders, mortgages became more readily available and for even greater amounts relative to people's incomes. This helped to push up prices. The belief that prices would continue to rise led lenders to relax their requirements even further. By the mid-2000s, many were allowing borrowers to self-certificate their income and were increasingly willing to lend to those with a poor credit history. This was known as the 'sub-prime' market. The ratio of average house prices to average earnings increased from 3.4 in 2002 to 5.74 in 2007. Problems in the mortgage market were a key contributing factor to the financial crises of 2007–8.

From late 2007 to 2012 the willingness of lenders to issue mortgages changed dramatically. The credit crunch in 2008–9 meant that the banks had less money to lend. Falling house prices and rising unemployment also made them much more wary. The number of 95 percent LTV mortgages available in the market collapsed from over 700 products in 2008 to virtually none in 2009. The highest LTV mortgages available were typically 75 per cent.

With support from the government-backed 'Help to buy' scheme, the number of 95 per cent LTV products recovered to around 400 in early 2020. This contributed to increasing house prices. However, the COVID-19 crisis had a similar impact on lenders as earlier recessions. The number of 95 per cent LTV products collapsed again. Research by the Bank of England in December 2020 found that around 75 per cent of renters were more likely to be constrained by a lack of sufficient savings to meet deposit requirements, rather than by the affordability of repayments. In response to this issue, the government introduced the Mortgage Guarantee Scheme in April 2021. This gives lenders who offer 95 per cent LTV mortgages the opportunity to purchase a guarantee that means the government will compensate a proportion of any losses in the event of repossession.

Speculation. A belief that house prices will continue to move in a particular direction can exacerbate house price movements. In other words, speculation tends to increase house price movements. In the 1980s, 1997–2007 and 2013–16, people generally believed that house prices would continue rising. This encouraged them to buy before prices went up any further. There was also an effect on supply. Those with houses to sell held back until the last possible moment in the hope of getting a higher price. The net effect was a rightward shift in the demand curve for houses and a leftward shift in the supply curve. The effect of this speculation, therefore, was to help bring about the very effect that people were predicting (for more on the impact of speculation see section 2.5).

In the early 1990s and late 2000s, the opposite occurred. Potential house buyers held back, hoping to get a better deal when prices had fallen. People with houses to sell tried to sell as quickly as possible before prices fell any further. Again, the effect of this speculation was to reinforce the changes – this time a fall in prices.

The impact of speculation has also been compounded by the growth in the 'buy-to-let' industry, with mortgage lenders entering this market in large numbers and a huge amount of media attention focused on the possibilities for individuals to make very high returns.

Taxation.   Stamp duty is a transaction tax that buyers of property and land have to pay in England and Northern Ireland if the price is above a certain level. Governments sometimes make temporary changes to the thresholds and/or the rates of this tax in response to large downturns in the housing market. For example, in September 2008 the government temporarily increased the threshold from £125 000 to £175 000 and this helped to boost prices. When the thresholds returned to their pre-crisis levels in January 2010, the number of house sales fell considerably.

The government responded in a similar manner during the COVID-19 crisis by increasing the stamp duty threshold to £500 000 in July 2020.[2] This appears to be one of the key driving factors behind the increase in prices in the second half of 2020. Originally, the government planned to return the thresholds back to their pre-crisis levels in April 2021. However, in the March 2021 Budget, the Chancellor announced that the temporary £500 000 threshold would be extended until July 2021. It would then fall to £250 000 before returning to pre-crisis levels in October 2021.

Supply.   Over the longer term, rising real incomes and the number of households have increased the demand for housing. How has supply responded?

In the 30 years from 1959 to 1988, 7 449 160 houses were built in England with the annual figure peaking at 352 540 in 1968. Just over 42 per cent of these (149 220) were built by not-for-profit organisations, such as local authorities or housing associations. In the 30 years from 1989 to 2018, 3 328 850 houses were built in England with an annual figure of just 125 000 in 2012–13. There were 220 600 new build completions in 2019–20[3] with less than 20 per cent financed by not-for-profit organisations.

Over the longer term, demand has exceeded the supply of houses and this has put upward pressure on prices.

What of the future?

The affordability of housing remains an important concern. In April 2020, the average house in England and Wales cost 7.8 times more than average annual earnings from work.[4] In 1997, the corresponding figure was 3.6. Housing is the least affordable it has ever been.

The supply of housing remains an issue. Estimates suggest that between 300 000 and 340 000 new homes need to be built per annum in England to make up for the lack of house building over the previous 40 years and the forecast growth in the number of households. Although there has been an increase in house building in recent years, it is still lower than the estimated number required. Local opposition, planning rules and building on the 'Green Belt' remain contentious issues.

The long-run impact of the COVID-19 crisis on the housing market is still very uncertain but it could lead to permanent changes in consumer preferences. For example, the increase in working from home means that a desk in the corner of a spare room is no longer sufficient for many people. Instead, they want dedicated workspaces and this increases the demand for bigger properties with more space. In the second half of 2020, the prices of detached houses in England and Wales grew faster than other property types. People may also not value proximity to offices in city centres as much as they did pre-crisis. Data show that house price growth in rural areas converged with urban areas in 2020, having been lower in previous years.[5] In May 2020, a survey found that 19 per cent of first-time buyers were more inclined to relocate to rural areas.

It will be interesting to see if these are temporary effects or whether they reflect permanent changes in people's preferences.

1. *Draw supply and demand diagrams to illustrate and explain what was happening to house prices (a) in the period from 1997 to 2007; (b) from 2008 to 2012; (c) in 2020.*
2. *What determines the supply of housing? How will factors on the supply side influence house prices?*
3. *What is the role of the prices of 'other goods' in determining the demand for housing?*
4. *There are four widely quoted measures of house prices – Nationwide, Halifax, Rightmove and the official House Price Index (HPI). Explain the strengths and weaknesses of these different measures. To what extent do they show the same movement in house prices?*

Find out what forecasters are predicting for house prices over the next year and attempt to explain their views.

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2 Prior to the crisis, the rate of stamp duty for former owner occupiers was 2 per cent on the value of properties between £125 000 and £250 000 and then 5 per cent for values over £250 000. First-time buyers did not pay stamp duty until the value of the property exceeded £300 000.

3 'Tackling the under-supply of housing in England', *House of Commons Research Briefing*, UK Parliament (January 2021), https://commonslibrary.parliament.uk/research-briefings/cbp-7671/

4 *Housing affordability in England and Wales: 2020*, ONS (March 2021), www.ons.gov.uk/peoplepopulationandcommunity/housing/bulletins/housingaffordabilityinenglandandwales/2020

5 *Recent trends in the housing market: January 2021*, ONS (February 2021), www.ons.gov.uk/economy/inflationandpriceindices/articles/priceseconomicanalysisquarterly/january2021

| BOX 2.2 | STOCK MARKET PRICES |

A business can transition from a private to a public company by selling shares to the public and becoming listed on the stock market. This is called an initial public offering (IPO). Firms that have already had an IPO can raise money by issuing new shares to the public. These are referred to as follow-on public offers (FPOs). In both cases the shares are sold on the 'primary stock market' and the owners of the shares receive 'dividend' payments, normally six-monthly. The size of the dividend will depend on the profitability of the company.

People or institutions that buy shares may not wish to hold on to them. They have the option to sell them in the 'secondary stock market' where existing shares are bought and sold. There are stock markets, primary and secondary, in all the major countries of the world.

There are 1988 companies (as of March 2021) whose shares and other securities are listed on the London Stock Exchange and trading in them takes place each weekday. The prices of shares depend on demand and supply. For example, if the demand for Vodafone shares at any one time exceeds the supply on offer, the price will rise until demand and supply are equal. Share prices fluctuate throughout the trading day and sometimes price changes can be substantial.

To give an overall impression of share price movements, stock exchanges publish share price indices. The most famous one in the UK is the FTSE ('footsie') 100, which stands for the 'Financial Times Stock Exchange' index of the 100 largest companies' shares. The index represents an average price of these 100 shares.

The chart shows movements in the FTSE 100 from 1995 to March 2021. The index was first calculated on 3 January 1984 with a base level of 1000 points. It reached a peak of 6930 points on 30 December 1999 and fell to 3287 on 12 March 2003, before rising again to a high of 6730 on 12 October 2007. However, with the financial crisis, the index fell to a low of 3512 on 3 March 2009. During the latter part of 2009, the index began to recover and then started on an upward trend. It reached its highest ever closing level of 7877 on 22 May 2018. Concerns about the impact of a trade war between China and the USA, and uncertainty over Brexit, put downward pressure on share prices and the index fell to 6728 in December 2018. It then recovered and reached 7457 on 19 February 2020.

Worries about the impact of the COVID-19 pandemic then began to have an impact on investor sentiment. The FTSE 100 fell by 32 per cent in just over a month and dropped below 5000 on 23 March 2020. With the ending of the first lockdown it climbed to over 6000 in May 2020. The development and successful rollout of the vaccine programme had a positive impact on investor confidence and the index climbed back over 7000 in April 2021.

What causes share prices to change? The answer lies in the determinants of the demand and supply of shares.

Demand

There are five main factors that affect the demand for shares.

Financial Times Stock Exchange Index (FTSE 100) (3/1/1984 = 1000)
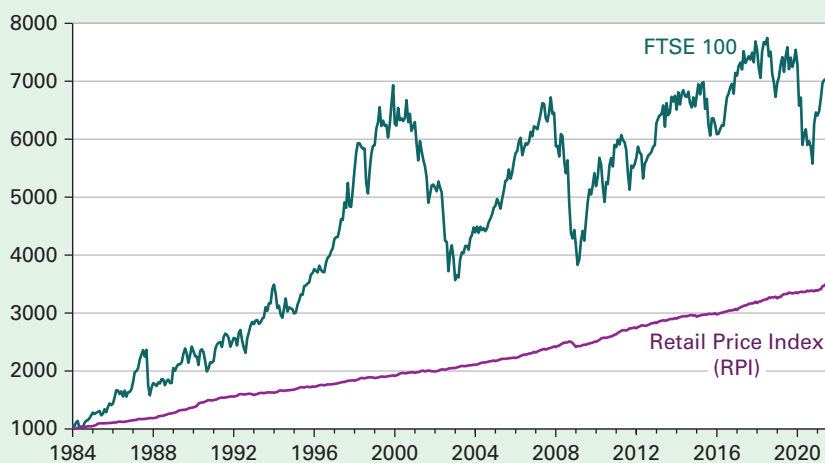
Note: FTSE figures based on end-of-month values.

Sources: Based on data from *RPI All Items Index*, ONS, www.ons.gov.uk/economy/inflationandpriceindices/timeseries/chaw/mm23; and various (2021).

The dividend yield.   This is the dividend on a share as a percentage of its price. The higher the dividend yields on shares the more attractive they are as a form of saving. One of the main explanations of rising stock market prices from 2003 to 2007 was high profits and resulting high dividends. The financial crisis and slowdown in the world economy explains the falling profits and dividends of companies from 2007 and the subsequent recovery in the global economy caused them to increase once again.

The price of and/or return on substitutes.   The main substitutes for shares in specific companies are other shares. If in comparison with other shares, Vodafone shares are expected to pay high dividends relative to the share price, people will buy Vodafone shares. As far as shares in general are concerned, the main substitutes are other forms of saving. If the interest rate on savings accounts in banks and building societies fell, people with such accounts would be tempted to withdraw their money and buy shares instead.

Another major substitute is property. If house prices rise rapidly, this will reduce the demand for shares as many people switch to buying property in anticipation of even higher prices. If house prices level off, as they did in 2018–19, this makes shares relatively more attractive as an investment and can boost the demand for them. If both house and share prices fall, investors may look for other, lower-risk substitutes, such as gold and government bonds.

Incomes.   If the economy is growing rapidly and people's incomes are rising rapidly, they are likely to save some of their extra income and therefore buy more shares. Thus from 2003 to 2007, when UK average real incomes were rising, share prices rose rapidly (see chart). When real incomes fell following the financial crisis in 2007–8, so did share prices. Average real incomes hardly grew after the financial crisis, and then fell in 2020 because of the COVID-19 crisis.

Wealth.   'Wealth' is people's accumulated savings and property. Wealth rose rapidly from the mid-1990s to mid-2000s with rising property prices and many people used their increased wealth to buy shares.

Expectations.   From 2003 to 2007, people expected share prices to go on rising. There was optimism about continued growth in the economy and in certain sectors, such as leisure and high-tech industries. As people bought shares, it put more upward pressure on share prices, thereby fuelling further speculation that they would go on rising and encouraging further buying.

With both the financial crisis and the COVID-19 pandemic, there were dramatic falls in share prices as investor confidence fell. As people anticipated further price falls, they held back from buying, thereby reducing demand and pushing prices lower. The success of the vaccine programme in the UK made investors increasingly confident about the chances of an economic recovery. So share prices began to rise consistently once more. Speculation is examined in more detail in section 2.5.

Supply

The factors affecting supply are largely the same as those affecting demand, but in the opposite direction.

If the return on alternative forms of saving falls, people with shares are likely to hold on to them, as they represent a better form of saving. The supply of shares to the market will fall. If incomes or wealth rise, people again are likely to want to hold on to their shares.

As far as expectations are concerned, if people believe that share prices will rise, they will hold on to the shares they have. Supply to the market will fall, thereby pushing up prices. If, however, they believe that prices will fall, as they did in 2008, they will sell their shares now before prices do fall. Supply will increase, driving down the price. Another clear example of this was the coronavirus pandemic. Fears over its negative impact on the economy led the FTSE index to fall dramatically between February and March 2020.

Share prices and business

Changes in share prices can crucially affect businesses. If a company's share price falls, it is a sign that 'the market' is losing confidence. Given the negative impact of the COVID-19 pandemic on air travel, the two companies that experienced the largest falls in their share price in 2020 were International Consolidated Airline Group (IAG) (British Airways, Iberia, Aer Lingus) and Rolls Royce Holdings (the second largest global producer of aircraft engines).

A falling share price makes it more difficult for a business to raise finance, not only by issuing additional shares in the primary market, but also from banks. It will also make the company more vulnerable to a takeover bid. This is where one company seeks to acquire another by offering to buy all its shares. A takeover will succeed if the owners of more than half of the company's shares vote to accept the price offer. Shareholders are more likely to accept the price offer if they have been disappointed by the recent performance of the company's shares.

1. *If the rate of economic growth in the economy is 3 per cent in a particular year, why are share prices likely to rise by more than 3 per cent that year?*
2. *Why would you expect the return on shares to be greater than that offered by a bank savings account?*

Find out what has happened to the FTSE 100 index over the past 12 months and explain why (see site B27 on the hotlinks part of the website).

Section summary

1. If the demand for a good exceeds the supply, there will be a shortage. This will lead to a rise in the price of the good.

2. If the supply of a good exceeds the demand, there will be a surplus. This will lead to a fall in the price.

3. Price will settle at the equilibrium. The equilibrium price is the one that clears the market: the price where demand equals supply.

4. If the demand or supply curve shifts, this will lead either to a shortage or to a surplus. Price will therefore either

rise or fall until a new equilibrium is reached at the position where the supply and demand curves now intersect.

5. It is difficult to identify the position of a real-world supply (or demand) curve simply by looking at the relationship between price and quantity at different points in time. The problem is that the other curve may have shifted (by an unknown amount).

2.4 ELASTICITY

Price elasticity of demand

When the price of a good rises, the quantity demanded will fall. But in most cases we will want to know more than this. We will want to know by just *how much* the quantity demanded will fall. In other words, we will want to know how *responsive* demand is to a rise in price.

Take the case of two products: oil and cabbages. In the case of oil, a rise in price is likely to result in a relatively small fall in the quantity demanded. If people want to continue driving, they have to pay the higher prices for fuel. A few may turn to riding bicycles, and some people may make fewer journeys, but for most people, a rise in the price of petrol and diesel will make little difference in the short term to how much they use their cars.

In the case of cabbages, however, a rise in price may lead to a substantial fall in the quantity demanded. The reason is that there are alternative vegetables that people can buy. Many people, when buying vegetables, will buy whatever is reasonably priced.

We call the responsiveness of demand to a change in price the *price elasticity of demand*, and it is one of the most important concepts in economics. For example, if we know the price elasticity of demand for a product, we can predict the effect on price and quantity of a shift in the *supply* curve for that product.

Figure 2.10 shows the effect of a shift in supply with two quite different demand curves (*D* and *D'*). Curve *D'* is more elastic than curve *D* over any given price range. In other words, for any given change in price, there will be a larger change in quantity demanded along curve *D'* than along curve *D*.

Assume that initially the supply curve is S_1, and that it intersects with both demand curves at point *a*, at a price of P_1 and a quantity of Q_1. Now supply shifts to S_2. What will happen to price and quantity? In the case of the less elastic demand curve *D*, there is a relatively large rise in price (to P_2) and a relatively small fall in quantity (to Q_2): equilibrium is at point *b*. In the case of the more elastic demand curve *D'*, however, there is only a relatively small rise in price (to P_3), but a relatively large fall in quantity (to Q_3): equilibrium is at point *c*.

Measuring the price elasticity of demand

What we want to compare is the size of the change in quantity demanded with the size of the change in price. But since

Figure 2.10   Market supply and demand

The effect on price of a shift in supply depends on the responsiveness of demand to a change in price
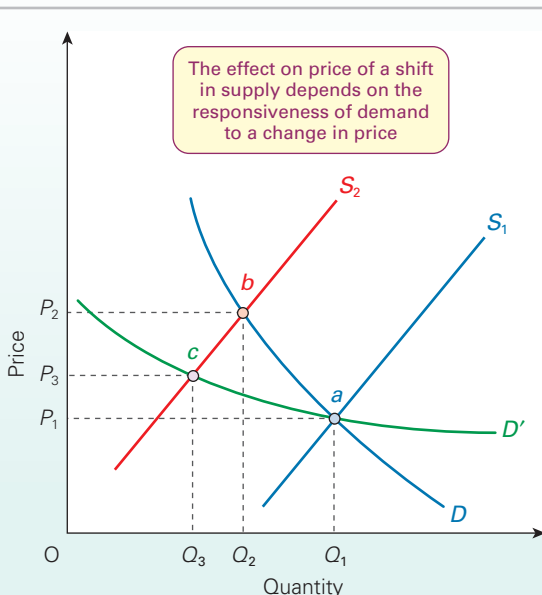
Definition

Price elasticity of demand The responsiveness of quantity demanded to a change in price.

price and quantity are measured in different units, the only sensible way we can do this is to use percentage or proportionate changes. This gives us the following *formula for the price elasticity of demand* (P_{ϵ_D}) for a product: percentage (or proportionate) change in quantity demanded divided by the percentage (or proportionate) change in price. Putting this in symbols gives:

$$P_{\epsilon_D} = \frac{\%\Delta Q_D}{\%\Delta P}$$

where ϵ (the Greek epsilon) is the symbol we use for elasticity, and Δ (the capital Greek delta) is the symbol we use for a 'change in'.

Thus if a 40 per cent rise in the price of oil caused the quantity demanded to fall by a mere 10 per cent, the price elasticity of oil over this range will be

$$\frac{-10\%}{40\%} = -0.25$$

whereas if a 5 per cent fall in the price of cabbages caused a 15 per cent rise in the quantity demanded, the price elasticity of demand for cabbages over this range would be

$$\frac{15\%}{-5\%} = -3$$

Cabbages have a more elastic demand than oil, and this is shown by the figures. But just what do these two figures show? What is the significance of minus 0.25 and minus 3?

Interpreting the figure for elasticity

The use of proportionate or percentage measures

Elasticity is measured in proportionate or percentage terms for the following reasons:

- It allows comparison of changes in two qualitatively different things, which are thus measured in two different types of unit: i.e. it allows comparison of *quantity* changes with *monetary* changes.
- It is the only sensible way of deciding *how big* a change in price or quantity is. Take a simple example. An item goes up in price by £1. Is this a big increase or a small increase? We can answer this only if we know what the original price was. If a can of beans goes up in price by £1 that is a huge price increase. If, however, the price of a house goes up by £1 that is a tiny price increase. In other words, it is the percentage or proportionate increase in price that determines how big a price rise is.

The sign (positive or negative)

Demand curves are generally downward sloping. This means that price and quantity change in opposite directions. A *rise* in price (a positive figure) will cause a *fall* in the quantity demanded (a negative figure). Similarly a *fall* in price will cause a *rise* in the quantity demanded. Thus when working out price elasticity of demand, we either divide a negative figure by a positive figure, or a positive figure by a negative. Either way, we end up with a negative figure.

The value (greater or less than 1)

If we now ignore the negative sign and just concentrate on the value of the figure, this tells us whether demand is *elastic* or *inelastic*.

Elastic ($\epsilon > 1$).   This is where a change in price causes a proportionately larger change in the quantity demanded. In this case, the value of elasticity will be greater than 1, since we are dividing a larger figure by a smaller figure. Hence, if the elasticity figure is -2.5 it tells us that if prices were increased by 1 per cent, demand would fall by 2.5 per cent. Customers are very sensitive to a change in the price.

Inelastic ($\epsilon < 1$).   This is where a change in price causes a proportionately smaller change in the quantity demanded. In this case, elasticity will be less than 1, since we are dividing a smaller figure by a larger figure. Hence, if the elasticity figure is –0.3 it tells us that if prices were increased by 1 per cent, demand would fall by 0.3 per cent. Customers are relatively insensitive to a change in the price.

Unit elastic ($\epsilon = 1$).   **Unit elasticity of demand** occurs where price and quantity demanded change by the same proportion. This will give an elasticity equal to 1 since we are dividing a figure by itself. An increase in price by 1 per cent leads to a fall in demand by 1 per cent.

Determinants of price elasticity of demand

The price elasticity of demand varies enormously from one product to another. For example, the demand for a holiday in any given resort typically has a price elasticity greater than 5, whereas the demand for electricity has a price elasticity less than 0.5 (ignoring the negative signs). But why do some products have a highly elastic demand, whereas others have a highly *in*elastic demand? What determines price elasticity of demand?

KI 9
p64

The number and closeness of substitute goods.   This is the most important determinant. The more substitutes there are and the closer they are to the good, the more people will switch

---

> ### Definitions
>
> **Formula for price elasticity of demand (P_{ϵ_D})** The percentage (or proportionate) change in quantity demanded divided by the percentage (or proportionate) change in price: $\%\Delta Q_D \div \%\Delta P$.
>
> **Elastic demand** Where quantity demanded changes by a larger percentage than price. Ignoring the negative sign, it will have a value greater than 1.
>
> **Inelastic demand** Where quantity demanded changes by a smaller percentage than price. Ignoring the negative sign, it will have a value less than 1.
>
> **Unit elasticity of demand** Where quantity demanded changes by the same percentage as price. Ignoring the negative sign, it will have a value equal to 1.

to these alternatives when the price of the good rises: the greater, therefore, will be the price elasticity of demand. The number of substitutes is strongly influenced by how broadly a market is defined.

A broadly defined market, such as alcohol, has very few substitutes. Customers tend to be relatively insensitive to the price. Using data from the *UK Expenditure and Food Survey* and its successor the *Living Costs and Food Survey,* Pryce, Hollingsworth and Walker[1] estimated an elasticity figure of −0.41 for alcohol sold on trade (in pubs and restaurants) in the UK, and −0.66 for alcohol sold off trade (in supermarkets and licensed shops). A more narrowly defined market, such as beer, is likely to have more substitutes (i.e. wine, spirits and cider) and so demand will tend to be less price inelastic. A figure of −0.81 has been estimated for off-trade beer and −0.99 for off-trade cider.[2] The elasticity of demand for a good produced by a single firm (i.e. a particular brand of whisky or beer) is likely to be even more price sensitive. Consumers can switch to another supplier of the same product.

> *Why will the price elasticity of demand for holidays in Crete be greater than that for holidays in general? Is this difference the result of a difference in the size of the income effect or the substitution effect? Is there anything the suppliers of holidays in Crete can do to reduce this higher price elasticity?*

The proportion of income spent on the good.   The higher the proportion of our income we spend on a good, the more we will be forced to cut consumption when its price rises: the bigger will be the income effect and the more elastic will be the demand.

Thus salt has a very low price elasticity of demand. Part of the reason is that there is no close substitute. But part is that we spend such a tiny fraction of our income on salt that we would find little difficulty in paying a relatively large percentage increase in its price: the income effect of a price rise would be very small. By contrast, there will be a much bigger income effect when a major item of expenditure rises in price. For example, if mortgage interest rates rise (the 'price' of loans for house purchase), people may have to cut down substantially on their demand for housing – being forced to buy somewhere much smaller and cheaper, or to live in rented accommodation.

> *Will a general item of expenditure such as food or clothing have a price-elastic or inelastic demand? (Consider both the determinants we have considered so far.)*

The time period.   When price rises, people may take time to adjust their consumption patterns and find alternatives. The longer the time period after a price change the more elastic the demand is likely to be.

To illustrate this, let us return to our example of oil. The Office for Budget Responsibility estimates that the price elasticity of demand for fuel is −0.07 in the short run and −0.13 in the medium term. Other studies have estimated a long-run figure of approximately −0.583.[3] Why is the figure for fuel so much more inelastic in the short run than the long run? If fuel prices rise, people will find it difficult to reduce their consumption by a significant amount in the short run. If public transport options are limited, they still have to drive their cars to work and for leisure purposes. Although the number of journeys they make may remain unchanged, some people may be able to reduce their fuel consumption slightly by driving more economically. Firms still have to use fuel to transport their goods and oil may be a major source of energy in a production process that cannot easily be changed.

Over time, people can find other ways to respond, such as purchasing new fuel-efficient vehicles, car sharing or moving closer to their work. Firms can also change their production methods and the way they transport their goods.

> *Demand for oil might be relatively elastic over the longer term, and yet it could still be observed that over time people consume more oil (or only very slightly less) despite rising oil prices. How can this apparent contradiction be explained?*

Price elasticity of demand and consumer expenditure

One of the most important applications of price elasticity of demand concerns its relationship with the total amount of money consumers spend on a product. **Total consumer expenditure (TE)** is simply price multiplied by quantity purchased.

$$TE = P \times Q$$

For example, if consumers buy 3 million units (Q) at a price of £2 per unit (P), they will spend a total of £6 million (TE).

Total consumer expenditure will be the same as the **total revenue** (TR) received by firms from the sale of the product (before any taxes or other deductions).

> ### Definitions
>
> **Total consumer expenditure on a product (TE) (per period of time)** The price of the product multiplied by the quantity purchased: $TE = P \times Q$.
>
> **Total revenue (TR) (per period of time)** The total amount received by firms from the sale of a product, before the deduction of taxes or any other costs. The price multiplied by the quantity sold: $TR = P \times Q$.

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1 Robert Pryce, Bruce Hollingsworth and Ian Walker, 'Alcohol quantity and quality price elasticities', *The European Journal of Health Economics*, Vol 20 (October 2018), https://pubmed.ncbi.nlm.nih.gov/30276497/

2 David Whitaker, 'Modelling UK alcohol and tobacco demand using the Living Costs and Food Survey', *Deloitte Media* (June 2019), https://ukdataservice.ac.uk/media/622477/whitaker.pdf

3 *Analysis of the Dynamic Effects of Fuel Duty Reductions* (HM Treasury, April 2014), www.gov.uk/government/publications/analysis-of-the-dynamic-effects-of-fuel-duty-reductions

What will happen to consumer expenditure (and hence firms' revenue) if there is a change in price? The answer depends on the price elasticity of demand.

Elastic demand

As price rises, so quantity demanded falls and vice versa. When demand is elastic, quantity demanded changes proportionately more than price. Thus the change in quantity has a bigger effect on total consumer expenditure than does the change in price. For example, when the price rises, there will be such a large fall in consumer demand that *less* will be spent than before. This can be summarised as follows:

- *P* rises; *Q* falls proportionately more; thus *TE* falls.
- *P* falls; *Q* rises proportionately more; thus *TE* rises.

In other words, total expenditure changes in the same direction as *quantity*.

This is illustrated in Figure 2.11. The areas of the rectangles in the diagram represent total expenditure. Why? The area of a rectangle is its height multiplied by its length. In this case, this is price multiplied by quantity bought, which is total expenditure. Demand is elastic between points *a* and *b*. A rise in price from £4 to £5 causes a proportionately larger fall in quantity demanded: from 20 million to 10 million. Total expenditure *falls* from £80 million (the striped area) to £50 million (the pink area).

When demand is elastic, then, a rise in price will cause a fall in total consumer expenditure and thus a fall in the total revenue that firms selling the product receive. A reduction in price, however, will result in consumers spending more, and hence firms earning more.

Inelastic demand

When demand is **inelastic,** it is the other way around. Price changes proportionately more than quantity. Thus the change in price has a bigger effect on total consumer expenditure than does the change in quantity. To summarise the effects:

- *P* rises; *Q* falls proportionately less; *TE* rises.
- *P* falls; *Q* rises proportionately less; *TE* falls.

In other words, total consumer expenditure changes in the same direction as *price.*

This is illustrated in Figure 2.12. Demand is inelastic between points *a* and *c.* A rise in price from £4 to £8 causes a proportionately smaller fall in quantity demanded: from 20 million to 15 million. Total expenditure *rises* from £80 million (the striped area) to £120 million (the pink area).

In this case, firms' revenue will increase if there is a rise in price and fall if there is a fall in price.

> **?** Assume that demand for a product is inelastic. Will consumer expenditure go on increasing as price rises? Would there be any limit?

Figure 2.11 Price elasticity of demand and total expenditure: elastic demand between two points
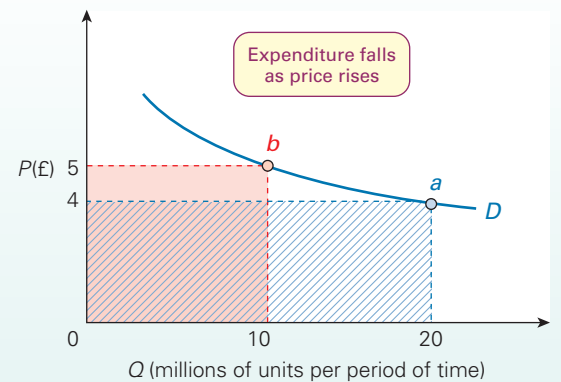
Special cases

Figure 2.13 shows three special cases: (a) a totally inelastic demand ($P_{\epsilon_D} = 0$), (b) an infinitely elastic demand ($P_{\epsilon_D} = \infty$) and (c) a unit elastic demand ($P_{\epsilon_D} = -1$).

Totally inelastic demand. This is shown by a vertical straight line. No matter what happens to price, quantity demanded remains the same. It is obvious that the more the price rises, the bigger will be the level of consumer expenditure. Thus in Figure 2.13(a), consumer expenditure will be higher at P_2 than at P_1.

> **?** Can you think of any examples of goods which have a totally inelastic demand (a) at all prices; (b) over a particular price range?

Infinitely elastic demand. This is shown by a horizontal straight line. At any price above P_1 in Figure 2.13(b), demand is zero. But at P_1 (or any price below) demand is 'infinitely' large.

Figure 2.12 Price elasticity of demand and total expenditure: inelastic demand between two points

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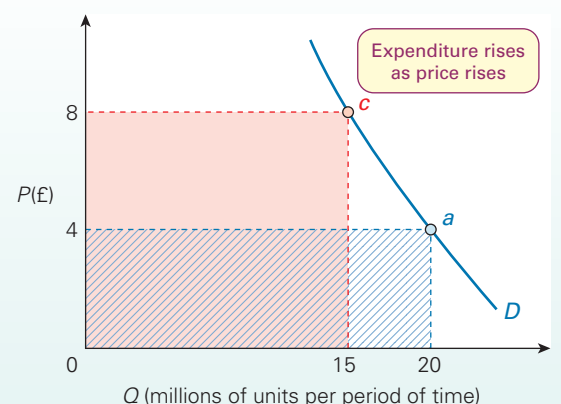
Figure 2.13   Price elasticity of demand: special cases

(a) Totally inelastic demand
$(P\epsilon_D = 0)$

(b) Infinitely elastic demand
$(P\epsilon_D = -\infty)$

(c) Unit elastic demand
$(P\epsilon_D = -1)$
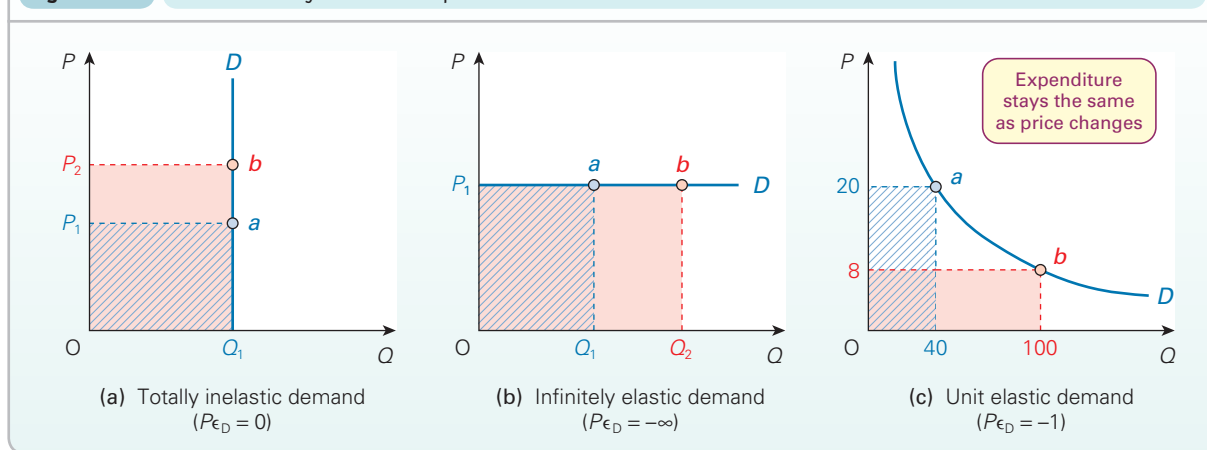
This seemingly unlikely demand curve is in fact relatively common for an *individual producer.* In a perfect market, as we have seen, firms are small relative to the whole market (like the small-scale grain farmer). They have to accept the price as given by supply and demand in the *whole market,* but at that price they can sell as much as they produce. (Demand is not *literally* infinite, but as far as the firm is concerned it is.) In this case, the more the individual firm produces, the more revenue will be earned. In Figure 2.13(b), more revenue is earned at Q_2 than at Q_1.

Unit elastic demand.   This is where price and quantity change in exactly the same proportion. Any rise in price will be exactly offset by a fall in quantity, leaving total consumer expenditure unchanged. In Figure 2.13(c), the striped area is exactly equal to the pink area: in both cases, total expenditure is £800.

You might have thought that a demand curve with unit elasticity would be a straight line at 45° to the axes. Instead it is a curve called a *rectangular hyperbola.* The reason for its shape is that the proportionate *rise* in quantity must equal the proportionate *fall* in price (and vice versa). As we move down the demand curve, in order for the *proportionate* change in both price and quantity to remain constant there must be a bigger and bigger *absolute* rise in quantity and a smaller and smaller absolute fall in price. For example, a rise in quantity from 200 to 400 is the same proportionate change as a rise from 100 to 200, but its absolute size is double. A fall in price from £5 to £2.50 is the same percentage as a fall from £10 to £5, but its absolute size is only half.

? *To illustrate these figures, draw the demand curve corresponding to the following table.*

P	Q	TE
£2.50	400	£1000
£5.00	200	£1000
£10.00	100	£1000
£20.00	50	£1000
£40.00	25	£1000

If the curve had an elasticity of −1 throughout its length, what would be the quantity demanded (a) at a price of £1; (b) at a price of 10p; (c) if the good were free?

The measurement of elasticity: arc elasticity

We have defined price elasticity as the percentage or proportionate change in quantity demanded divided by the percentage or proportionate change in price. But how, in practice, do we measure these changes for a specific demand curve? We shall examine two methods. The first is called the *arc method.* The second (in an optional section) is called the *point method.*

A common mistake that students make is to think that you can talk about the elasticity of a *whole curve.* In fact in most cases the elasticity will vary along the length of the curve.

Take the case of the demand curve illustrated in Figure 2.14. Between points *a* and *b,* total expenditure rises $(P_2Q_2 > P_1Q_1)$: demand is thus elastic between these two points. Between points *b* and *c,* however, total expenditure falls $(P_3Q_3 < P_2Q_2)$. Demand here is inelastic.

Normally, then, we can only refer to the elasticity of a *portion* of the demand curve, not of the *whole* curve. There are, however, two exceptions to this rule.

Figure 2.14   Different elasticities along different portions of a demand curve
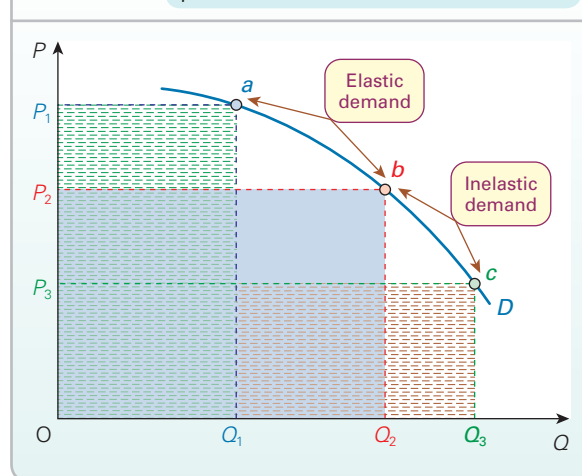
How to increase sales and price

When we are told that a product will make us more attractive, enrich our lives, make our clothes smell great or allow us to save the planet, just what are the social media influencers up to? 'Trying to sell the product', you may reply.

In fact there is a bit more to it than this. Social media influencers are trying to do two things:

- Shift the product's demand curve to the right.
- Make it less price elastic.

This is illustrated in the diagram.

Effect of advertising on the demand curve
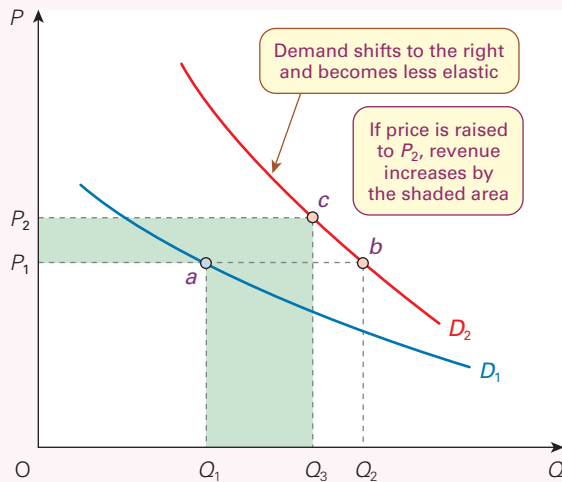
D_1 shows the original demand curve with price at P_1 and sales at Q_1. D_2 shows the curve after an endorsement by a social media influencer. The rightward shift allows an increased quantity (Q_2) to be sold at the original price. If the demand is also made highly inelastic, the firm can raise its price and still have a substantial increase in sales. Thus, in the diagram, price can be raised to P_2 and sales will be

Q_3 – still substantially above Q_1. The total gain in revenue is shown by the shaded area.

How can endorsements bring about this new demand curve?

Shifting the demand curve to the right

This can occur in two ways. First, if the social media influencer brings the product to more people's attention, then the market for the good grows and the demand curve shifts to the right. Second, if the social influencer increases people's desire for the product, they will be prepared to pay a higher price for each unit purchased.

Making the demand curve less elastic

This will occur if the social influencer creates greater brand loyalty. People must be led to believe (rightly or wrongly) that competitors' brands are inferior. This can be done by comparing the brand being endorsed with a competitor's product. Alternatively, the endorsement may concentrate on making the product seem so special that it implies that no other product can compete. These approaches will allow the firm to raise its price above that of its rivals with no significant fall in sales. The substitution effect will have been lessened because consumers have been led to believe that there are no close substitutes.

1. *Think of some social media endorsements or advertisements that deliberately seek to make demand less elastic.*
2. *Imagine that a social influencer endorses a particular brand of gym wear. In particular, they state that the light breathable material keeps moisture away from your body during exercise, leaving you feeling dry and more comfortable. What do you think would happen to the demand curve for another brand of gym wear? Consider both the direction of the shift and the effect on elasticity. How will this affect the pricing policy and sales of this other brand?*
3. *Research a recent advertising or social media campaign. Identify what characteristics or attributes the campaign is attempting to highlight and what perceptions it is trying to influence. Where possible, examine the impact of the campaign so far.*

The first is when the elasticity just so happens to be the same all the way along a curve, as in the three special cases illustrated in Figure 2.13. The second is where two curves are drawn on the same diagram, as in Figure 2.10. Here we can say that demand curve *D* is less elastic than demand curve *D'* at any given price. Note, however, that each of these two curves will still have different elasticities along its length.

Although we cannot normally talk about the elasticity of a whole curve, we can nevertheless talk about the elasticity between any two points on it. This is known as **arc elasticity**. In fact, the formula for price elasticity of demand that we have used so far is the formula for arc elasticity. Let us examine it more closely. Remember the formula we used was:

$$\frac{\text{Proportionate } \Delta Q}{\text{Proportionate } \Delta P} \text{(where } \Delta \text{ means 'change in')}$$

The way we measure a proportionate change in quantity is to divide that change by the level of Q: $\Delta Q/Q$. Similarly, we measure a proportionate change in price by dividing that change by the level of P: $\Delta P/P$. Price elasticity of demand can thus now be rewritten as
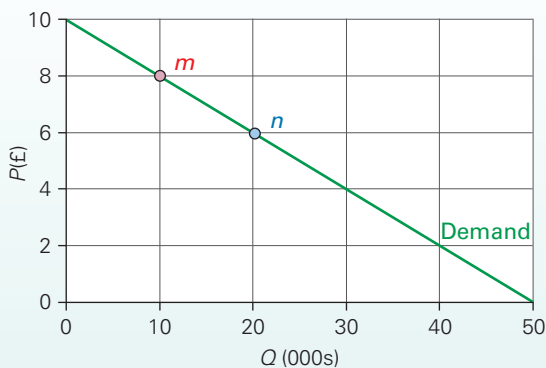
$$\frac{\Delta Q}{Q} \div \frac{\Delta P}{P}$$

Definition

Arc elasticity The measurement of elasticity between two points on a curve.

Figure 2.15   Measuring elasticity

But just what value do we give to *P* and *Q*? Consider the demand curve in Figure 2.15. What is the elasticity of demand between points *m* and *n*? Price has fallen by £2 (from £8 to £6), but what is the proportionate change? Is it $-^2/_8$ or $-^2/_6$? The convention is to express the change as a proportion of the average of the two prices, £8 and £6: in other words, to

take the midpoint price, £7. Thus the proportionate change is $-^2/_7$.

Similarly, the proportionate change in quantity between points *m* and *n* is $^{10}/_{15}$, since 15 is midway between 10 and 20.

Thus using the **average (or 'midpoint') formula**, arc elasticity between *m* and *n* is given by:

$$\frac{\Delta Q}{\text{average } Q} \div \frac{\Delta P}{\text{average } P} = \frac{10}{15} \div \frac{-2}{7} = -2.33$$

Since, ignoring the negative sign, 2.33 is greater than 1, demand is elastic between *m* and *n*.

Referring to Figure 2.15, use the midpoint formula to calculate the price elasticity of demand between (a) P = 6 and P = 4; (b) P = 4 and P = 2. What do you conclude about the elasticity of a straight-line demand curve as you move down it?

Definition

Average (or 'midpoint') formula for price elasticity of demand $\Delta Q_D/\text{average } Q_D \div \Delta P/\text{average } P$.

BOX 2.4   **ANY MORE FARES?**

Pricing on the buses

Imagine that a local bus company is faced with increased costs and fears that it will make a loss. What should it do?

The most likely response of the company will be to raise its fares. But this may be the wrong policy, especially if existing services are underutilised. To help it decide what to do, it commissions a survey to estimate passenger demand at three different fares: the current fare of 50p per mile, a higher fare of 60p and a lower fare of 40p. The results of the survey are shown in the first two columns of the table.

Demand turns out to be elastic. This is because of the existence of alternative means of transport. As a result of the elastic demand, total revenue can be increased by reducing the fare from the current 50p to 40p. Revenue would rise from £2m to £2.4m per annum.

But what will happen to the company's profits? Its profit is the difference between the total revenue from passengers and its total costs of operating the service. If buses are currently

underutilised, it is likely that the extra passengers can be carried without the need for extra buses, and hence at no extra cost.

At a fare of 50p, the old profit was £0.2m (£2.0m − £1.8m). After the increase in costs, a 50p fare now gives a loss of £0.2m (£2.0m − £2.2m).

By raising the fare to 60p, the loss is increased to £0.4m. But by lowering the fare to 40p, a profit of £0.2m can again be made.

1. *Estimate the price elasticity of demand between 40p and 50p and between 50p and 60p.*
2. *Was the 50p fare the best fare originally?*
3. *The company considers lowering the fare to 30p, and estimates that demand will be 8.5 million passenger miles. It will have to put on extra buses, however. How should it decide?*

Investigate ticket pricing on a local bus service near you. Assess whether the pricing policy is in (a) the company's interests; (b) the passengers'.

Fare (£ per mile)	Estimated demand (passenger miles per year: millions)	Total revenue (£ millions per year)	Old total cost (£ millions per year)	New total cost (£ millions per year)
(1)	(2)	(3)	(4)	(5)
0.40	6	2.4	1.8	2.2
0.50	4	2.0	1.8	2.2
0.60	3	1.8	1.8	2.2

*The measurement of elasticity: point elasticity

Rather than measuring elasticity between two points on a demand curve, we may want to measure it at a single point: for example, point *r* in Figure 2.16. In order to measure **point elasticity** we must first rearrange the terms in the formula $\Delta Q/Q \div \Delta P/P$. By doing so we can rewrite the formula for price elasticity of demand as:

$$\frac{\Delta Q}{\Delta P} \times \frac{P}{Q}$$

Since we want to measure price elasticity at a *point* on the demand curve, rather than between two points, it is necessary to know how quantity demanded would react to an *infinitesimally small* change in price. In the case of point *r* in Figure 2.16, we want to know how the quantity demanded would react to an infinitesimally small change from a price of 30.

An infinitesimally small change is signified by the letter *d*. The formula for price elasticity of demand thus becomes

$$\frac{dQ}{dP} \times \frac{P}{Q}$$

where *dQ/dP* is the differential calculus term for the rate of change of quantity with respect to a change in price (see Appendix 1). And conversely, *dP/dQ* is the rate of change of price with respect to a change in quantity demanded. At any given point on the demand curve, *dP/dQ* is given by the *slope* of the curve (its rate of change). The slope is found by drawing a tangent to the curve at that point and finding the slope of the tangent.

The tangent to the demand curve at point *r* is shown in Figure 2.16. Its slope is $-50/100$. Thus, *dP/dQ* is $-50/100$ and *dQ/dP* is the inverse of this, $-100/50 = -2$.

Figure 2.16 Measuring elasticity at a point

$P\epsilon_d = (1 \,/\, \text{slope}) \times P/Q$
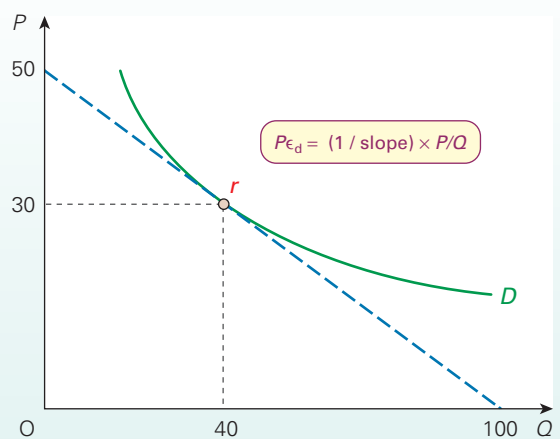
Returning to the formula $dQ/dP \times P/Q$, elasticity at point *r* equals

$$-2 \times \frac{30}{40} = -1.5$$

Rather than having to draw the graph and measure the slope of the tangent, the technique of differentiation can be used to work out point elasticity as long as the equation for the demand curve is known. An example of the use of this technique is given in Box 2.5 (on page 62).

Definition

Point elasticity The measurement of elasticity at a point on a curve. The formula for price elasticity of demand using the point elasticity method is *dQ/dP × P/Q*, where *dQ/dP* is the inverse of the slope of the tangent to the demand curve at the point in question.

*LOOKING AT THE MATHS

Elasticity of a straight-line demand curve

A straight-line demand curve has a different elasticity at each point on it. The only exceptions are a vertical demand curve ($P\epsilon_D = 0$) and a horizontal demand curve ($P\epsilon_D = \infty$). The reason for this differing elasticity can be demonstrated using the equation for a straight-line demand curve:

$$Q = a - bP$$

The term '−*b*' would give the slope of the demand curve if we were to plot *Q* on the vertical axis and *P* on the horizontal. Since we plot them the other way around,[1] the term '*b*' gives the inverse of the slope as plotted. The slope of the curve as plotted is given by *dP/dQ*; the inverse of the slope is given by $dQ/dP = -b$).

The formula for price elasticity of demand (using the point elasticity method) is

$$P\epsilon_D = \frac{dQ}{dP} \cdot \frac{P}{Q}$$

Different elasticities along a straight-line demand curve
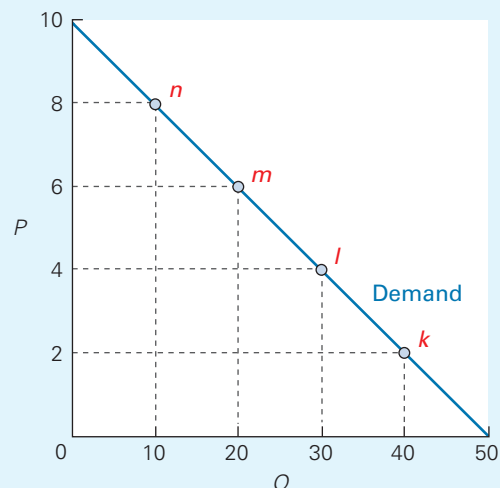
This can thus be rewritten as

$$P\epsilon_D = -b\frac{P}{Q}$$

This is illustrated in the diagram, which plots the following demand curve:

$$Q = 50 - 5P$$

The slope of the demand curve (dP/dQ) is constant (i.e. $-10/50$ or -0.2). The inverse of the slope (dQ/dP) is thus -5, where 5 is the 'b' term in the equation. In this example, therefore, price elasticity of demand is given by

$$P\epsilon_D = -5\frac{P}{Q}$$

The value of P/Q, however, differs along the length of the demand curve. At point n, $P/Q = 8/10$. Thus

$$P\epsilon_D = -5(8/10) = -4$$

At point m, however, $P/Q = 6/20$. Thus

$$P\epsilon_D = -5(6/20) = -1.5$$

? *These questions refer to the diagram.*
1. *What is the price elasticity of demand at points l and k?*
2. *What is the price elasticity of demand at the point (a) where the demand curve crosses the vertical axis; (b) where it crosses the horizontal axis?*
3. *As you move down a straight-line demand curve, what happens to elasticity? Why?*
4. *Calculate price elasticity of demand between points n and l using the arc method. Does this give the same answer as the point method? Would it if the demand curve were actually curved?*

1 It is contrary to normal convention to plot the independent variable (P) on the vertical axis and the dependent variable (Q) on the horizontal axis. The reason why we do this is because there are many other diagrams in economics where Q is the *independent* variable. Such diagrams include cost curves and revenue curves, which we will consider in Chapter 6. As you will see, it is much easier if we *always* plot Q on the horizontal axis even when, as in the case of demand curves, Q is the dependent variable.

| *BOX 2.5 | USING CALCULUS TO CALCULATE THE PRICE ELASTICITY OF DEMAND | EXPLORING ECONOMICS |

(A knowledge of the rules of differentiation is necessary to understand this box. See Appendix 1.)

The following is an example of an equation for a demand curve:

$$Q_d = 60 - 15P + P^2$$

(where Q_d is measured in thousands of units). From this the following table and the graph can be constructed.

P	60	−15P	+P²	=	Q_d (000s)
0	60	−0	+0	=	60
1	60	−15	+1	=	46
2	60	−30	+4	=	34
3	60	−45	+9	=	24
4	60	−60	+16	=	16
5	60	−75	+25	=	10
6	60	−90	+36	=	6

Point elasticity can be easily calculated from such a demand equation using calculus. To do this you will need to know the rules of differentiation (see pages A:9–13). Remember the formula for point elasticity:

$$P\epsilon_D = dQ/dP \times P/Q$$

The term dQ/dP can be calculated by differentiating the demand equation:

Given $Q_d = 60 - 15P + P^2$
then $dQ/dP = -15 + 2P$
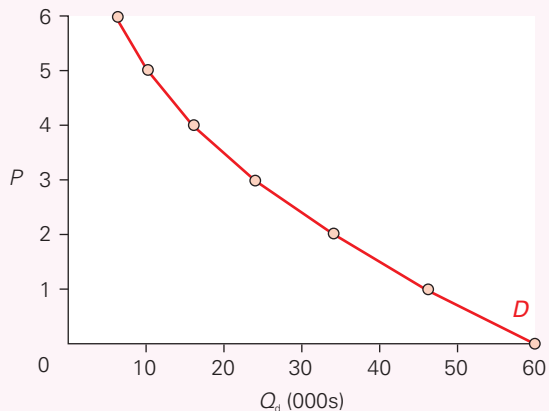
Thus at a price of 3, for example,

$$dQ/dP = -15 + (2 \times 3)$$
$$= -9$$

Thus price elasticity of demand at a price of 3

$$= -9 \times P/Q$$
$$= -9 \times 3/24$$
$$= -9/8 \text{(which is elastic)}$$

? *Calculate the price elasticity of demand on this demand curve at a price of (a) 5; (b) 2; (c) 0.*

Price elasticity of supply ($P\epsilon_s$)

When price changes, there will be not only a change in the quantity demanded, but also a change in the quantity supplied. Frequently we will want to know just how responsive quantity supplied is to a change in price. The measure we use is the *price elasticity of supply*.

Figure 2.17 shows two supply curves. Curve S_2 is more elastic between any two prices than curve S_1. Thus, when price rises from P_0 to P_1 there is a larger increase in quantity supplied with S_2 (namely, Q_0 to Q_2) than there is with S_1 (namely, Q_0 to Q_1). For any shift in the demand curve there will be a larger change in quantity supplied and a smaller change in price with curve S_2 than with curve S_1. Thus the effect on price and quantity of a shift in the demand curve will depend on the price elasticity of supply.

The *formula for the price elasticity of supply* (P_{ϵ_s}) is: the percentage (or proportionate) change in quantity supplied divided by the percentage (or proportionate) change in price. Putting this in symbols gives

$$P\epsilon_s = \frac{\%\Delta Q_s}{\%\Delta P}$$

In other words, the formula is identical to that for the price elasticity of demand, except that quantity in this case is quantity *supplied*. Thus if a 10 per cent rise in price caused a 25 per cent rise in the quantity supplied, the price elasticity of supply would be

25%/10% = 2.5

and if a 10 per cent rise in price caused only a 5 per cent rise in the quantity, the price elasticity of supply would be

5%/10% = 0.5

In the first case, supply is elastic ($P_{\epsilon_s} > 1$); in the second it is inelastic ($P_{\epsilon_s} < 1$). Notice that, unlike the price elasticity of demand, the figure is positive. This is because price and quantity supplied change in the *same* direction.

Determinants of price elasticity of supply

The amount that costs rise as output rises.   The less the additional costs of producing additional output, the more firms will be encouraged to produce for a given price rise: the more elastic will supply be.

Supply is thus likely to be elastic if firms have plenty of spare capacity, if they can readily get extra supplies of raw materials, if they can easily switch away from producing alternative products and if they can avoid having to introduce overtime working, at higher rates of pay. The less these conditions apply, the less elastic will supply be.

Time period

- Immediate time period. Firms are unlikely to be able to increase supply by much immediately. Supply is virtually fixed, or can only vary according to available stocks. Supply is highly inelastic.

Figure 2.17 Supply curves with different price elasticity of supply
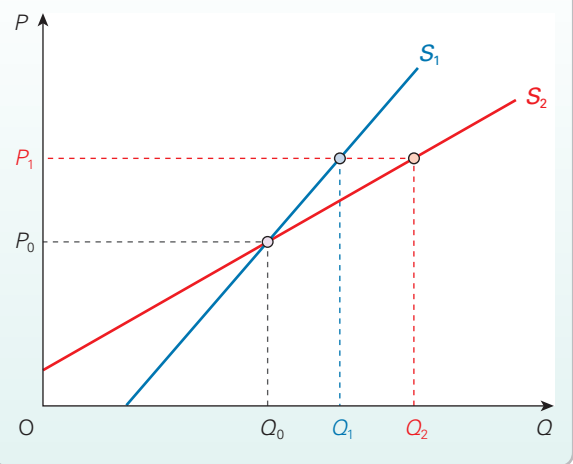
- Short run. If a slightly longer period of time is allowed to elapse, some inputs can be increased (e.g. raw materials) while others will remain fixed (e.g. heavy machinery). Supply can increase somewhat.
- Long run. In the long run, there will be sufficient time for all inputs to be increased and for new firms to enter the industry. Supply, therefore, is likely to be highly elastic in many cases. In some circumstances the long-run supply curve may even slope downwards. (See the section on economies of scale in Chapter 6, pages 167–8.)

The measurement of price elasticity of supply

A vertical supply has zero elasticity. It is totally unresponsive to a change in price. A horizontal supply curve has infinite elasticity. There is no limit to the amount supplied at the price where the curve crosses the vertical axis.

When two supply curves cross, the steeper one will have the lower price elasticity of supply (e.g. curve S_1 in Figure 2.17). Any straight-line supply curve starting at the origin, however, will have an elasticity equal to 1 throughout its length, *irrespective of its slope*. This perhaps rather surprising result is illustrated in Figure 2.18. This shows three supply curves, each with a different slope, but each starting from the origin. On each curve two points are marked. In each case there is the *same* proportionate rise in Q as in P. For example, with curve S_1 a doubling in price from £3 to £6 leads to a doubling of output from 1 unit to 2 units.

Definitions

Price elasticity of supply The responsiveness of quantity supplied to a change in price.

Formula for price elasticity of supply (P_{ϵ_s}) The percentage (or proportionate) change in quantity supplied divided by the percentage (or proportionate) change in price: %ΔQ_s ÷ %ΔP. Using the arc formula, this is calculated as ΔQ_S/average Q_S ÷ ΔP/average P.

Figure 2.18   Unit elastic supply curves
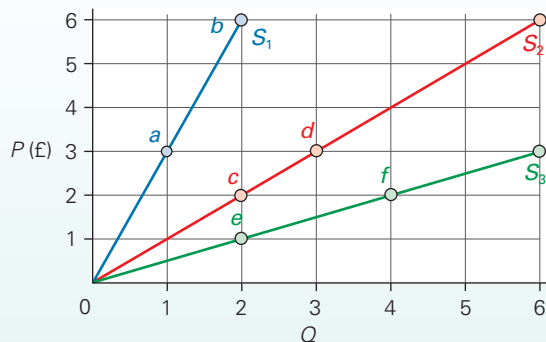
This demonstrates nicely that it is not the *slope* of a curve that determines its elasticity, but its proportionate change.

Other supply curves' elasticities will vary along their length. In such cases we have to refer to the elasticity either between two points on the curve, or at a specific point. Calculating elasticity between two points will involve the **arc method**. Calculating elasticity at a point will involve the point method. These two methods are just the same for supply curves as for demand curves: the formulae are the same, only the term Q now refers to quantity supplied rather than quantity demanded.

Income elasticity of demand

So far, we have looked at the responsiveness of demand and supply to a change in price. But price is just one of the determinants of demand and supply. In theory, we could look at the responsiveness of demand or supply to a change in *any* one of their determinants. We could have a whole range of different types of elasticity of demand and supply.

> **KEY IDEA 9**
>
> *Elasticity.* The responsiveness of one variable (e.g. demand) to a change in another (e.g. price). This concept is fundamental to understanding how markets work. The more elastic variables are, the more responsive is the market to changing circumstances.

In practice, there are just two other elasticities that are particularly useful to us, and both are demand elasticities.

The first is the *income elasticity of demand* (Y_{ϵ_D}). This measures the responsiveness of demand to a change in consumer incomes (Y). It enables us to predict how much the demand curve will shift for a given change in income. The *formula for the income elasticity of demand* is: the percentage (or proportionate) change in demand divided by the percentage (or proportionate) change in income. Putting this in symbols gives

$$Y_{\epsilon_D} = \frac{\%\Delta Q_D}{\%\Delta Y}$$

*LOOKING AT THE MATHS

We can use a supply equation to demonstrate why a straight-line supply curve through the origin has an elasticity equal to 1. Assume that the supply equation is

$$Q_s = a + bP \qquad (1)$$

If the supply curve passes through the origin, the value of $a = 0$. Thus:

$$Q_s = bP \qquad (2)$$

The point elasticity formula for price elasticity of supply is similar to that for price elasticity of demand (see pages 61–2) and is given by

$$P\epsilon_s = \frac{dQ_s}{dP} \cdot \frac{P}{Q_s} \qquad (3)$$

But

$$b = \frac{dQ_s}{dP} \qquad (4)$$

since this is the slope of the equation (the inverse of the slope of the curve). Substituting equation (4) in equation (3) gives

$$P\epsilon_s = b \cdot \frac{P}{Q_s} \qquad (5)$$

Substituting equation (2) in equation (5) gives:

$$P\epsilon_s = b \cdot \frac{P}{bP}$$
$$= \frac{bP}{bP}$$
$$= 1$$

? *Given the following supply schedule:*

P	2	4	6	8	10
Q	0	10	20	30	40

(a) *Draw the supply curve.*
(b) *Using the arc method, calculate price elasticity of supply (i) between P = 2 and P = 4; (ii) between P = 8 and P = 10.*
(c) **Using the point method, calculate price elasticity of supply at P = 6.*
(d) *Does the elasticity of the supply curve increase or decrease as P and Q increase? Why?*
(e) *What would be the answer to (d) if the supply curve were a straight line but intersecting the horizontal axis to the right of the origin?*

Definitions

Formula for price elasticity of supply (arc method)
ΔQ_s/average $Q_s \div \Delta P$/average P.

Income elasticity of demand   The responsiveness of demand to a change in consumer incomes.

Formula for income elasticity of demand (Y_{ϵ_D})   The percentage (or proportionate) change in demand divided by the percentage (or proportionate) change in income: $\%\Delta Q_D \div \%\Delta Y$.

In other words, the formula is identical to that for the price elasticity of demand, except that we are dividing the change in demand by the change in income that caused it rather than by a change in price. Thus if a 2 per cent rise in income caused an 8 per cent rise in a product's demand, then its income elasticity of demand would be:

8%/2% = 4

The major determinant of income elasticity of demand is the degree of 'necessity' of the good. In a developed country, the demand for luxury goods expands rapidly as people's incomes rise, whereas the demand for basic goods rises only a little. Thus items such as designer handbags and foreign holidays have a high income elasticity of demand, whereas items such as vegetables and socks have a low income elasticity of demand.

If income elasticity of demand is positive and greater than 1 then this tells us that the share of consumers' income spent on the good increases as their income rises. If the figure is positive but less than 1 then this tells us that the share of consumers' income spend on the good falls as income rises. In both of these cases people demand more of the good as incomes rise. However, the demand for some goods actually *decreases* as people's incomes rise beyond a certain level. These are inferior goods such as supermarkets' 'value lines' and bus journeys. As people earn more, so they switch to better quality products. Unlike **normal goods**, which have a positive income elasticity of demand, **inferior goods** have a negative income elasticity of demand.

?   *Look ahead to Table 3.1 (page 95). It shows the income elasticity of demand for various foodstuffs. Explain the difference in the figures for milk, fish and fruit juice.*

Income elasticity of demand is an important concept to firms considering the future size of the market for their product. If the product has a high income elasticity of demand, sales are likely to expand rapidly as national income rises, but may also fall significantly if the economy moves into recession. (See Case Study 2.6, Income elasticity of demand and the balance of payments, on the student website. This shows how the concept of income elasticity of demand can help us understand why so many developing countries have chronic balance of payments problems.)

Cross-price elasticity of demand ($C\epsilon_{D_{AB}}$)

This is often known by its less cumbersome title of **cross elasticity of demand**. It is a measure of the responsiveness of demand for one product to a change in the price of another (either a substitute or a complement). It enables us to predict how much the demand curve for the first product will shift when the price of the second product changes.

The **formula for the cross-price elasticity of demand ($C\epsilon_{D_{AB}}$)** is: the percentage (or proportionate) change in demand for good A divided by the percentage (or proportionate) change in price of good B. Putting this in symbols gives

$$C\epsilon_{D_{AB}} = \frac{\%\Delta Q_{D_A}}{\%\Delta P_B}$$

If good B is a *substitute* for good A, A's demand will *rise* as B's price rises. In this case, cross elasticity will be a positive figure. For example, if the demand for butter rose by 2 per cent when the price of margarine (a substitute) rose by 8 per cent, then the cross elasticity of demand for butter with respect to margarine would be

2%/8% = 0.25

If good B is *complementary* to good A, however, A's demand will *fall* as B's price rises and thus as the quantity of B demanded falls. In this case, cross elasticity of demand will be a negative figure. For example, if a 4 per cent rise in the price of bread led to a 3 per cent fall in demand for butter, the cross elasticity of demand for butter with respect to bread would be

−3%/4% = −0.75

The major determinant of cross elasticity of demand is the closeness of the substitute or complement. The closer it is, the bigger will be the effect on the first good of a change in the price of the substitute or complement, and hence the greater the cross elasticity – either positive or negative. For example, a figure of 1.169 has been estimated for the cross-price elasticity of demand for on-trade spirits (i.e. whisky, vodka, etc.) with respect to the price of on-trade beer. This suggests they are moderately close substitutes in consumption.

Firms need to know the cross elasticity of demand for their product when considering the effect on the demand

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Definitions

Normal goods Goods whose demand increases as consumer incomes increase. They have a positive income elasticity of demand. Luxury goods will have a higher income elasticity of demand than more basic goods.

Inferior goods Goods whose demand decreases as consumer incomes increase. Such goods have a negative income elasticity of demand.

Cross-price elasticity of demand The responsiveness of demand for one good to a change in the price of another.

Formula for cross-price elasticity of demand ($C\epsilon_{D_{AB}}$) The percentage (or proportionate) change in demand for good A divided by the percentage (or proportionate) change in price of good B: $\%\Delta Q_{D_A} \div \%\Delta P_B$.

for their product of a change in the price of a rival's product or of a complementary product. These are vital pieces of information for firms when making their production plans.

Another application of the concept of cross elasticity of demand is in the field of international trade and the balance of payments. How does a change in the price of domestic goods affect the demand for imports? If there is a high cross elasticity of demand for imports (because they are close substitutes for home-produced goods), and if prices at home rise due to inflation, the demand for imports will rise substantially, thus worsening the balance of trade.

? *Which are likely to have the highest cross elasticity of demand: two brands of coffee, or coffee and tea?*

THRESHOLD CONCEPT 6 **ELASTICITY: OF A VARIABLE TO A CHANGE IN A DETERMINANT** **THINKING LIKE AN ECONOMIST**

As we have seen in the case of price elasticity of demand, elasticity measures the responsiveness of one variable (e.g. quantity demanded) to change in another (e.g. price). This concept is fundamental to understanding how markets work. The more elastic variables are, the more responsive is the market to changing circumstances.

Elasticity is more than just a technical term. It's not difficult to learn the formula

$$P\epsilon_D = \frac{\%\Delta Q_D}{\%\Delta P}$$

in the case of price elasticity of demand, and then to interpret this as

$$P\epsilon_D = \frac{\Delta Q_D}{\text{average } Q_D} \div \frac{\Delta P}{\text{average } P}$$

using the arc elasticity method, or as

$$P\epsilon_D = \frac{dQ_D}{dP} \times \frac{P}{Q}$$

using the point elasticity method.

We can also very simply state the general formula for any elasticity as

$$\epsilon_{XY} = \frac{\%\Delta X}{\%\Delta Y}$$

where the formula refers to the responsiveness of variable X to a change in variable Y (where X could be quantity supplied or demanded, and Y could be price, income, the price of substitutes, or any other determinant of demand or supply). Again, we could use the arc or point elasticity methods. Although students often find it hard at first to use the formulae, it's largely a question of practice in mastering them.

What makes elasticity a *threshold concept* is that it lies at the heart of how economic systems operate. In a market economy, prices act as signals that demand or supply has changed. They also act as an incentive for people to respond to the new circumstances. The greater the elasticity of demand, the bigger will be the response to a change in supply; the greater the elasticity of supply, the bigger will be the response to a change in demand.

Understanding elasticity and what determines its magnitude helps us understand how an economy is likely to respond to the ever-changing circumstances of the real world.

In a perfect market economy, firms face an infinitely elastic (horizontal) demand curve: they are price takers (see page 35 and Figure 2.13(b)). What this means is that they have no power to affect prices: they are highly dependent on market forces.

By contrast, big businesses (and some small ones too) are in a very different position. If there are only one or two firms in a market, each is likely to face a relatively inelastic demand. This gives them the power to raise prices and make more profit. As we have seen, if demand is price inelastic, then raising price will increase the firm's revenue (see Figure 2.13(b)). Even if demand is elastic (but still downward sloping) the firm could still increase profit by raising prices, provided that the fall in revenue was less than the reduction in costs from producing less. The general point here is that the less elastic is the firm's demand curve, the greater will be its power to raise prices and make a bigger profit.

It's not just price elasticity of demand that helps us understand how market economies operate. In a perfect market, market supply is likely to be highly elastic, especially in the long run after firms have had time to enter the industry. Thus, if a new lower-cost technique is discovered, which increases profits in an industry, new firms will enter the market, attracted by the higher profits. This increased supply will then have the effect of driving prices down and hence profit rates will fall back. What this means is that in highly competitive industries firms are very responsive to changing economic circumstances. If they are not, they are likely to be forced out of business; it's a question of survival of the fittest. We explore this process in more detail in section 7.2.

If there is less competition, firms have an easier life. But what is good for them may be bad for us as consumers. We may end up paying higher prices and having poorer quality goods – although not necessarily. We explore this in sections 7.3 and 7.4 and in Chapter 8.

So, getting to grips with elasticity is not just about doing calculations. It's about understanding the very essence of how economies operate.

? 1. *What would you understand by the 'wage elasticity of demand for labour'? How would the magnitude of this elasticity affect the working of the market for (a) plumbers and (b) footballers?*
2. *How can income elasticity of demand help explain how the structure of economies changes over the years?*

*LOOKING AT THE MATHS

Calculating income and cross-price elasticities from a demand equation

The following demand equation relates quantity demanded (Q_A) for good A to its own price (P_A), consumer income (Y) and the price of a substitute good B (P_B).

$$Q_A = a - bP_A + cY + eP_B$$

Note that this is a 'linear' equation because it has no power terms, such as P^2 or Y^2. The formula[1] for income elasticity of demand for good A will be

$$Y\epsilon_D = \frac{\partial Q_A}{\partial Y} \cdot \frac{Y}{Q_A}$$

But since the term $\partial Q_A/\partial Y$ represents the amount that Q_A will change for a given change in Y (i.e. the value of c), then

$$Y\epsilon_D = c\frac{Y}{Q_A}$$

Similarly, the formula for cross-price elasticity of demand for good A with respect to good B will be

$$C\epsilon_{D_{AB}} = \frac{\partial Q_A}{\partial P_B} \cdot \frac{P_B}{Q_A} = e\frac{P_B}{Q_A}$$

A worked example of these two formulae is given in Maths Case 2.2 on the student website. We can also use calculus to work out the two elasticities for both linear and non-linear demand equations. A worked example of this is given in Maths Case 2.3 on the student website.

1 Note that in this case we use the symbol '∂' rather than 'd' to represent an infinitely small change. This is the convention when the equation contains more than one independent variable (in this case P_A, Y and P_B). The term $\partial Q_A/\partial Y$ is the 'partial derivative' (see pages A:12–13) and refers to the rate of change of Q_A to just one of the three variables (in this case Y).

BOX 2.6   DIGITAL PLATFORMS

The economics of two-sided markets

When we study markets, we tend to think of suppliers selling a good or service to one side of that market. For example, manufacturers selling to wholesalers, wholesalers selling to retailers or retailers selling to final customers. For many markets to work effectively, appropriate institutions and procedures are sometimes required to help facilitate the exchange of goods. Some businesses compete by offering these services. For example, they:

- help to put buyers and sellers of goods into contact with one another in a cost-effective manner
- supply impartial information about the quality of the goods/services on offer
- supply information about the reliability of consumers (i.e. do they pay promptly?) and the sellers (i.e. do they supply the good in a timely fashion?)
- offer payment systems to enable exchange to take place as smoothly as possible.

Therefore, these businesses act as intermediaries and sell their services to both sides of a market – both consumers and sellers. In other words, they operate in two-sided markets.

Institutions and organisations that offer these services date back over many hundreds of years. Good examples which date back hundreds of years are the market squares and market days in many European towns. Modern examples are shopping centres such as the '*Metrocentre'* in Gateshead, '*Meadowhall'* in Sheffield and '*Merry Hill'* in the West Midlands. The private businesses that own these shopping centres, such as Intu, Hammerson and British Land, help to facilitate exchange by bringing customers and retailers together.

The number and relative importance of businesses offering these services has increased significantly with the growth in digital markets. Out of the ten most valuable companies in the world measured by market capitalisation (i.e. the number of shares issued multiplied by the value of each share), seven (Apple, Microsoft, Amazon, Alphabet, Facebook, Tencent, Alibaba) are online market platforms. Some other examples are:

- Uber (taxi drivers and riders)
- Airbnb (hosts and guests)
- JustEat (takeaway food outlets and customers)
- Sony PlayStation, Microsoft Xbox, Nintendo Switch (games players and games developers)
- Viagogo (ticker buyers and ticket resellers)
- Checkatrade (tradespeople and customers).

In some cases, users on one side of the market do not always value the interaction the platform provides with users on another side of the market. Social media users often dislike advertisers and their intrusive adverts.

Network effects

An important factor that helps to determine the success of two-sided platforms is network effects. Direct network effects exist where the value or benefit a person experiences from using a platform increases with the number of other users on the same side of the market. For example, the more people that use a particular social media website, the more valuable it becomes to other users.

However, indirect/cross network effects are even more important. These exist where the value of, and hence willingness to pay for, the services of people on one side of the market increases with the number of users on the other side of the market. This creates a chicken-and-egg problem for the platform businesses. Having large numbers of buyers will attract more sellers, but to attract the buyers, the platform initially needs more sellers.

(continued)

Pricing

How should the firm set prices? Should they charge users on one side of the market far more than those on the other? In traditional one-sided markets, price elasticity of demand plays a key role in determining an effective strategy: i.e. charging lower prices to more price-sensitive consumers. Indirect network effects in two-sided markets can further reinforce this effect.

For example, assume a platform business has two different types of users – buyers and sellers. Assume the buyers are more price sensitive than the sellers, so the platform reduces prices to this group of users. The initial benefit to the business is the increase in the number of buyers now using the platform in response to the lower prices. However, there are additional benefits. The indirect network effects mean that sellers will now value the platform more highly and so will be willing to pay higher fees for its services. More sellers will also start using the platform, which may in turn attract more buyers.

The whole process sets off a virtuous circle – more buyers leads to more sellers, which leads to more buyers and so on. Reducing prices even further for buyers may lower the profits the platform makes from that side of the market but this may be more than offset by the extra profits it makes from sellers. Therefore, optimal pricing strategies in two-sided markets may be very different from those in one-sided markets.

Some key questions affect the size of these indirect network effects. These include:

- To what extent do sellers value the platform's services more than the buyers?
- How much more price insensitive are the sellers than the buyers?

- How responsive is the willingness to pay of the sellers to the number of buyers who use the platform?
- How responsive are the numbers of sellers to the numbers of buyers that use the platform and *vice versa*?

In some circumstances, the indirect network effects are so strong that the platform subsidises one group of users so they can access the services free of charge, for example search engines and social media websites.

Compatibility

Another issue for platform businesses is the extent to which they are compatible with other rival platforms. In other words, can a consumer on one platform connect with a seller on a different platform and *vice versa*? Platform businesses may be tempted to make them incompatible so consumers are locked into using their services. However, users can overcome this problem by joining more than one platform, known as 'multihoming'. For example, people can use eBay and Amazon, while the developers of popular applications usually make them available on both Android and iOS operating systems.

1. *When we draw demand curves, we usually assume that the number of other customers has no impact on the value a consumer places on a product. How would the diagram change if there were network effects?*
2. *What factors determine the extent of multihoming in platform markets?*

Investigate one or two other real-world examples where a firm operates in both single- and two-sided markets simultaneously. Examine their network effects and pricing policies.

Section summary

1. Elasticity is a measure of the responsiveness of demand (or supply) to a change in one of the determinants.

2. It is defined as the proportionate change in quantity demanded (or supplied) divided by the proportionate change in the determinant.

3. If quantity changes proportionately more than the determinant, the figure for elasticity will be greater than 1 (ignoring the sign): it is elastic. If the quantity changes proportionately less than the determinant, the figure for elasticity will be less than 1: it is inelastic. If they change by the same proportion, the elasticity has a value of 1: it is unit elastic.

4. Price elasticity of demand measures the responsiveness of demand to a change in price. Given that demand curves are downward sloping, price elasticity of demand will have a negative value. Demand will be more elastic the greater the number and closeness of substitute goods, the higher the proportion of income spent on the good and the longer the time period that elapses after the change in price.

5. When demand is price elastic, a rise in price will lead to a reduction in total expenditure on the good and hence a reduction in the total revenue of producers.

6. Demand curves normally have different elasticities along their length. We can thus normally refer only to the specific value for elasticity between two points on the curve or at a single point.

7. Elasticity measured between two points is known as arc elasticity. When applied to price elasticity of demand the formula is

$$\frac{\Delta Q_d}{\text{average } Q_d} \div \frac{\Delta P}{\text{average } P}$$

*8. Elasticity measured at a point is known as point elasticity. When applied to price elasticity of demand the formula is

$$\frac{dQ}{dP} \times \frac{P}{Q}$$

where dQ/dP is the inverse of the slope of the tangent to the demand curve at the point in question.

9. Price elasticity of supply measures the responsiveness of supply to a change in price. It has a positive value. Supply will be more elastic the less costs per unit rise as output rises and the longer the time period.

10. Income elasticity of demand measures the responsiveness of demand to a change in income. For normal goods it has a positive value. Demand will be more income elastic the more luxurious the good and the less rapidly demand is satisfied as consumption increases. For inferior goods, income elasticity has a negative value.

11. Cross-price elasticity of demand measures the responsiveness of demand for one good to a change in the price of another. For substitute goods the value will be positive; for complements it will be negative. The cross-price elasticity will be higher the closer the two goods are as substitutes or complements.

2.5 THE TIME DIMENSION

The full adjustment of price, demand and supply to a situation of disequilibrium will not be instantaneous. It is necessary, therefore, to analyse the time path which supply takes in responding to changes in demand, and which demand takes in responding to changes in supply.

Short-run and long-run adjustment

TC 6
p66

As we saw in the previous section, elasticity varies with the time period under consideration. The reason is that producers and consumers take time to respond to a change in price. The longer the time period, the bigger the response, and thus the greater the elasticity of supply and demand.

This is illustrated in Figures 2.19 and 2.20. In both cases, as equilibrium moves from points a to b to c, there is a large short-run price change (P_1 to P_2) and a small short-run quantity change (Q_1 to Q_2), but a small long-run price change (P_1 to P_3) and a large long-run quantity change (Q_1 to Q_3).

Price expectations and speculation

In a world of shifting demand and supply curves, prices do not stay the same. Sometimes they go up; sometimes they come down.

If people think prices are likely to change in the foreseeable future, this will affect the behaviour of buyers and sellers *now*. If, for example, it is now December and you are thinking of buying a new television, you might decide to wait until the January sales, and in the meantime make do with your set. If, on the other hand, in December you see a summer holiday advertised that you like, you might well book it then and not wait until nearer the summer for fear that the price will have gone up by then. Thus a belief that prices will go up will cause people to buy now; a belief that prices will come down will cause them to wait.

The reverse applies to sellers. If you are thinking of selling your house and prices are falling, you will want to sell it as quickly as possible. If, on the other hand, prices are rising

Figure 2.19 Response of supply to an increase in demand
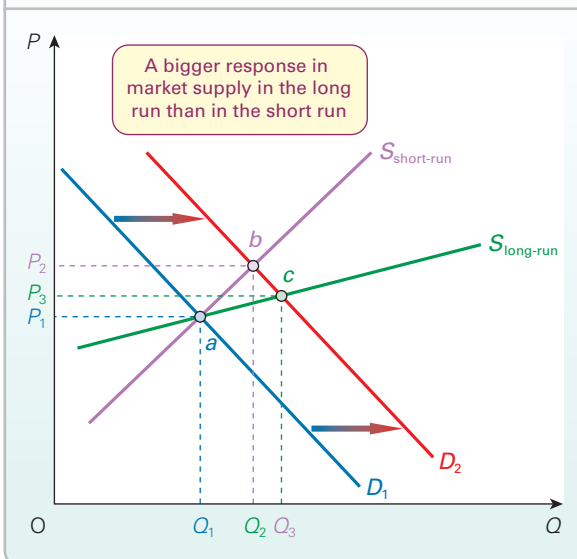
Figure 2.20 Response of demand to an increase in supply
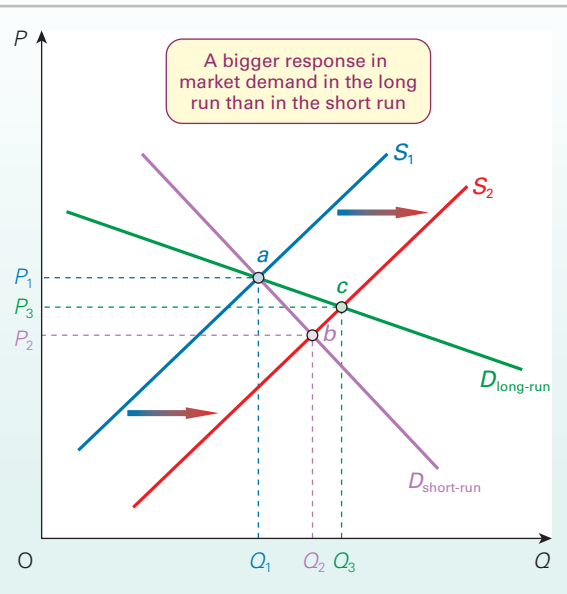
sharply, you will wait as long as possible so as to get the highest price. Thus a belief that prices will come down will cause people to sell now; a belief that prices will go up will cause them to wait.

> **KEY IDEA 10**
>
> **People's actions are influenced by their expectations.** People respond not just to what is happening now (such as a change in price), but to what they anticipate will happen in the future.

This behaviour of looking into the future and making buying and selling decisions based on your predictions is called *speculation*. Speculation is often based on current trends in prices. If prices are currently rising, people may try to decide whether they are about to peak and go back down again, or whether they are likely to go on rising. Having made their prediction, they will then act on it. Their actions will then affect demand and supply, which in turn will affect price. Speculation is commonplace in many markets: the stock exchange, the foreign exchange market and the housing market are three examples.

Sometimes people will take advantage of expected price rises purely to make money and have no intention of keeping the item they have bought. For example, if shares in a particular company are expected to rise in price, people may buy them now while they are cheap and sell them later when the price has risen, thereby making a profit from the difference in price.

Similarly, people will sometimes take advantage of expected price reductions by selling something now only to buy it back later. For example, if you own shares and expect their price to fall, you may sell them now and buy them back later when their price has fallen. Again, you make a profit from the difference in price.

Sometimes the term *speculation* is used in this narrower sense of buying (or selling) commodities or financial assets simply to make money from later selling them (or buying them back) again at a higher (or lower) price. The term *speculators* usually refers to people engaged in such activities.

In the extreme case, speculators need not part with any money. If they buy an item and sell it back fairly soon at a higher price, they may be able to use the money from the sale to pay the original seller: just pocketing the difference. Alternatively, speculators may sell an item they do not even possess, as long as they can buy it back in time (at a lower price) to hand it over to the original purchaser. Again, they simply pocket the difference in price.

It may sound as if speculators are on to a good thing, and often they are, but speculation does carry risks: the predictions of individual speculators may turn out to be wrong, and then they could make losses rather than profits.

Nevertheless, speculators on average tend to gain rather than lose. The reason is that speculation tends to be *self-fulfilling*. In other words, the actions of speculators tend to bring about the very effect on prices that they had anticipated. For example, if speculators believe that the price of Barclays shares is about to rise, they will buy some. But by doing this

they will contribute to an increase in demand and ensure that the price *will* rise; the prophecy has become self-fulfilling.

Speculation can either help to reduce price fluctuations or aggravate them: it can be stabilising or destabilising.

Stabilising speculation

Speculation will tend to have a **stabilising** effect on price fluctuations when suppliers and/or demanders believe that a change in price is only *temporary*.

An initial fall in price.   In Figure 2.21 demand has shifted from D_1 to D_2; equilibrium has moved from point *a* to point *b,* and price has fallen to P_2. How do people react to this fall in price?

Given that they believe this fall in price to be only temporary, suppliers *hold back,* expecting prices to rise again: supply shifts from S_1 to S_2. After all, why supply now when, by waiting, they could get a higher price?

Buyers *increase* their purchases, to take advantage of the temporary fall in price. Demand shifts from D_2 to D_3.

The equilibrium moves to point *c*, with price rising back towards P_1.

An initial rise in price.   In Figure 2.22 demand has shifted from D_1 to D_2. Price has risen from P_1 to P_2.

Suppliers bring their goods to market now, before price falls again. Supply shifts from S_1 to S_2. Demanders, however, hold

Definitions

Speculation Where people make buying or selling decisions based on their anticipations of future prices.

Speculators People who buy (or sell) commodities or financial assets with the intention of profiting by selling them (or buying them back) at a later date at a higher (lower) price.

Self-fulfilling speculation The actions of speculators tend to cause the very effect that they had anticipated.

Stabilising speculation Where the actions of speculators tend to reduce price fluctuations.

Figure 2.21   Stabilising speculation: initial price fall

Speculators believe that the fall in price to P_2 is only temporary
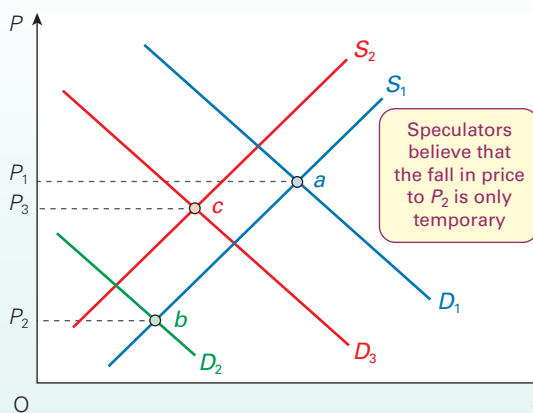
Figure 2.22   Stabilising speculation: initial price rise

Speculators believe that the rise in price to P_2 is only temporary

Figure 2.23   Destabilising speculation: initial price fall

Speculators believe that the fall in price to P_2 signifies a trend
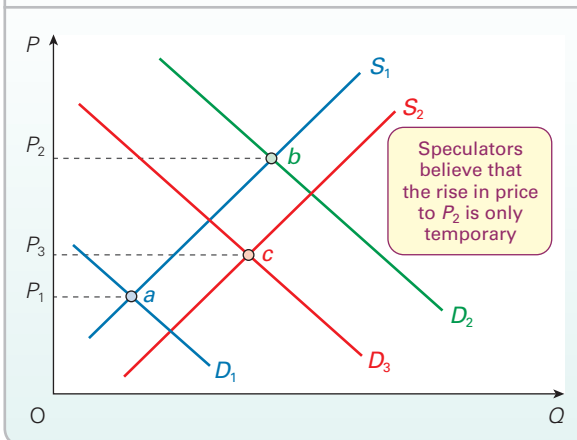
back until price falls. Demand shifts from D_2 to D_3. The equilibrium moves to point *c,* with price falling back towards P_1.

An example.   A good example of stabilising speculation is that which occurs in agricultural commodity markets. Take the case of wheat. When it is harvested in the autumn, there will be a plentiful supply. If all this wheat were to be put on the market, the price would fall to a very low level. Later in the year, when most of the wheat would have been sold, the price would then rise to a very high level. This is all easily predictable.

So what do farmers do? The answer is that they speculate. When the wheat is harvested, they know price will tend to fall, and so instead of bringing it all to market they put some into store. The more the price falls, the more they will put into store *anticipating that the price will later rise.* But this holding back of supplies prevents prices from falling. In other words, it stabilises prices.

Later in the year, when the price begins to rise, they will gradually release grain onto the market from the stores. The more the price rises, the more they will release on to the market *anticipating that the price will fall again by the time of the next harvest.* But this releasing of supplies will again stabilise prices by preventing them from rising so much.

Rather than the farmers doing the speculation, it could be done by grain merchants. When there is a glut of wheat in the autumn, and prices are relatively low, they buy wheat on the grain market and put it into store. When there is a shortage in the spring and summer, they sell wheat from their stores. In this way they stabilise prices just as the farmers did when they were the ones who operated the stores.

? *In Figures 2.21 and 2.22, the initial change in price was caused by a shift in the demand curve. Redraw these two diagrams to illustrate the situation where the initial change in price was caused by a shift in the supply curve (as would be the case in the wheat market that we have just considered).*

Destabilising speculation

Speculation will tend to have a *destabilising* effect on price fluctuations when suppliers and/or buyers believe that a change in price heralds similar changes to come.
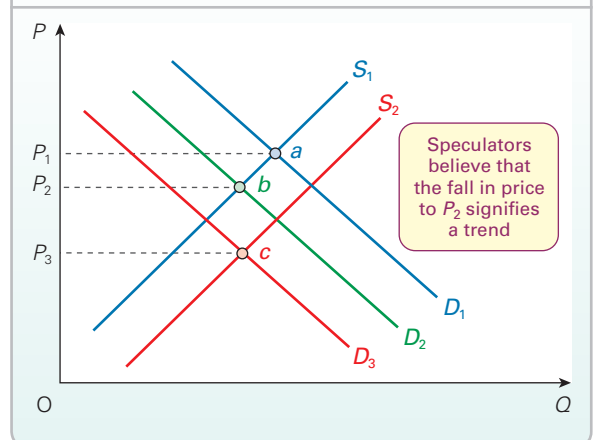
An initial fall in price.   In Figure 2.23 demand has shifted from D_1 to D_2 and price has fallen from P_1 to P_2. This time, believing that the fall in price heralds further falls in price to come, suppliers sell now before the price does fall. Supply shifts from S_1 to S_2. And demanders wait: they wait until price does fall further. Demand shifts from D_2 to D_3.

Their actions ensure that price does fall further: to P_3.

An initial rise in price.   In Figure 2.24 a price rise from P_1 to P_2 is caused by a rise in demand from D_1 to D_2. Suppliers wait until price rises further. Supply shifts from S_1 to S_2. Demanders buy now before any further rise in price. Demand shifts from D_2 to D_3. As a result, price continues to rise: to P_3.

In section 2.3 we examined the housing market (see Box 2.1). In this market, speculation is frequently destabilising. Assume that people see house prices beginning to move upwards. This might be the result of increased demand brought about by a cut in mortgage interest rates or by

Figure 2.24   Destabilising speculation: initial price rise

Speculators believe that the rise in price to P_2 signifies a trend
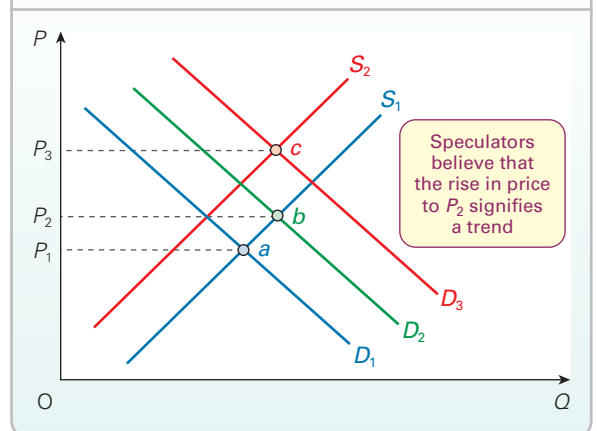
Definition

Destabilising speculation Where the actions of speculators tend to make price movements larger.

growth in the economy. People may well believe that the rise in house prices signals a boom in the housing market: that prices will go on rising. Potential buyers will thus try to buy as soon as possible before prices rise any further. This will increase demand (as in Figure 2.24) and will thus lead to even bigger price rises. This is precisely what happened in the UK housing market in 1999–2007 and from mid-2013 (see chart in Box 2.1 on page 48). Conversely, in early 2008 prices started to fall; potential buyers believed that they would fall further and thus held off entering the market, leading to even bigger price falls.

Estate agents consistently 'talk up' the housing market, often predicting price rises when other commentators are more cautious. Explain why they might have a vested interest in doing so.

Conclusion

In some circumstances, then, the action of speculators can help to keep price fluctuations to a minimum (stabilising speculation). This is most likely when markets are relatively stable in the first place, with only moderate underlying shifts in demand and supply.

In other circumstances, however, speculation can make price fluctuations much worse. This is most likely in times of uncertainty, when there are significant changes in the determinants of demand and supply. Given this uncertainty, people may see price changes as signifying some trend. They then 'jump on the bandwagon' and do what the rest are doing, further fuelling the rise or fall in price.

Redraw Figures 2.23 and 2.24 assuming, as in the first question on page 71, that the initial change in price was caused by a shift in the supply curve.

Dealing with uncertainty and risk

When price changes are likely to occur, buyers and sellers will try to anticipate them. Unfortunately, on many occasions no one can be certain just what these price changes will be. Take the case of stocks and shares. If you anticipate that the price of, say, Marks & Spencer shares is likely to go up substantially in the near future, you may well decide to buy some now and then sell them later after the price has risen. But you cannot be certain that they will go up in price: they may fall instead. If you buy the shares, therefore, you will be taking a gamble.

Now, gambles can be of two types. The first is where you know the odds. Let us take the simplest case of a gamble on the toss of a coin. Heads you win; tails you lose. You know that the odds of winning are precisely 50 per cent. If you bet on the toss

of a coin, you are said to be operating under conditions of *risk*. *Risk is when the probability of an outcome is known.* Risk itself is a measure of the *variability* of an outcome. For example, if you bet £1 on the toss of a coin, such that heads you win £1 and tails you lose £1, then the variability is −£1 to £1.

The second form of gamble is the more usual. This is where the odds are not known or are known only roughly. Gambling on the stock exchange is like this. You may have a good idea that a share will go up in price, but is it a 90 per cent chance, an 80 per cent chance or what? You are not certain. Gambling under this sort of condition is known as operating under **uncertainty**. *This is when the probability of an outcome is not known.*

You may well disapprove of gambling and want to dismiss people who engage in it as foolish or morally wrong. But 'gambling' is not just confined to horses, cards, roulette and the like. Risk and uncertainty pervade the whole of economic life, and decisions are constantly having to be made whose outcome cannot be known for certain. Even the most morally upright person will still have to decide which career to go into, whether and when to buy a house, or even something as trivial as whether or not to take an umbrella when going out. Each of these decisions and thousands of others are made under conditions of uncertainty (or occasionally risk).

> **KEY IDEA 11** **People's actions are influenced by their attitudes towards risk.** Many decisions are taken under conditions of risk or uncertainty. Generally, the lower the probability of (or the more uncertain) the desired outcome of an action, the less likely people will be to undertake the action.

Give some examples of decisions you have taken recently that were made under conditions of uncertainty. With hindsight do you think you made the right decisions?

We shall be examining how risk and uncertainty affect economic decisions on several occasions throughout the book. For example, in Chapter 5 we will see how it affects people's attitudes and actions as consumers and how taking out insurance can help to reduce their uncertainty. At this point, however, let us focus on firms' attitudes when supplying goods.

Stock holding as a way of reducing the problem of uncertainty

A simple way that suppliers can reduce the problem of uncertainty is by holding stocks. Take the case of the wheat farmers we saw in the previous section. At the time when

Definitions

Risk When a (desirable) outcome of an action may or may not occur, but the probability of its occurring is known. The lower the probability, the greater the risk involved in taking the action.

Uncertainty When an outcome may or may not occur and its probability of occurring is not known.

they are planting the wheat in the spring, they are uncertain as to what the price of wheat will be when they bring it to market. If they keep no stores of wheat, they will just have to accept whatever the market price happens to be at harvest time. If, however, they have storage facilities, they can put the wheat into store if the price is low and then wait until the price goes up. Alternatively, if the price of wheat is high at harvest time, they can sell the wheat straight away. In other words, they can choose the time to sell.

BOX 2.7   SHORT SELLING

Gambling on a fall in share prices

A form of speculation that can be very damaging to stock markets is the practice of **short selling**. This is where people take advantage of anticipated falls in share prices by selling shares they do not possess. How does this work?

Assume that a share price is currently £10 per share and traders on the stock market believe that the price is about to fall. They want to take advantage of this but don't possess any. What they do is borrow shares from dealers who do own some and agree to return them on a specified date. They pay a fee for doing this. In the meantime they sell the shares on the market at the current price of £10 and wait for it to fall. They are now 'short' of the shares (i.e. they don't possess them but still owe them).

Assume that just before the agreed time comes for returning the shares the price has fallen to £8. The trader then buys the shares, returns them to the dealer who had lent them and pockets the difference of £2 (minus the fee).

Although anyone can short sell shares, it is largely traders from various financial institutions who engage in this practice. Huge bonuses can be earned from their employers if the short selling is profitable. This encourages an atmosphere of risk-taking and looking to short-term gains rather than providing long-term capital to firms.

Short selling in the banking crisis of 2008

The practice of short selling had become rife and added to the instability of markets, driving share prices down that were anticipated to fall. This was a particular problem in 2008, when worries about bad debts and losses in the banking sector led many traders to short sell the shares of banks and other financial institutions felt to be most at risk.

The short selling of Halifax Bank of Scotland (HBOS) shares in September 2008 was a major contributing factor to the collapse in its share price. HBOS, the UK's largest mortgage lender, had been suffering losses as a result of falling house prices and difficulties of many house owners in keeping up with their monthly mortgage payments. The share price plummeted by over 70 per cent in the space of a few days. The fall was driven on by speculation, much of it short selling. On 17 September it was announced that HBOS would be taken over by Lloyds TSB.

Concerns about the practice of short selling driving instability in financial markets led a number of governments – or agencies acting on their behalf – to introduce temporary bans on the practice. In September 2008, the Financial Services Authority, the UK industry's regulator at the time, announced a four-month ban on the practice. At the same time, the US financial regulator, the Securities and Exchange Commission, announced a similar move. Both these bans were imposed for a matter of months, whereas Denmark held a similar policy for more than two years.

In May 2012, the EU passed a law giving the European Securities and Markets Authority (ESMA) the power to ban short selling in emergency situations: i.e. where it threatens the stability of the EU financial system. The UK government opposed the legislation but the EU Court of Justice rejected the challenge in 2014.

Is short selling always profitable?

Short selling, as with other forms of speculation, is a type of gambling. If you gamble on a price fall and the price does fall, your gamble pays off and you make a profit. If you get it wrong, however, and the price rises, you will make a loss. In the case of short selling, you would have to buy the shares (to give back to the lender) at a higher price than you sold them for.

This is just what happened in September 2008. With central banks around the world supporting markets, with the US government announcing that it would take over the bad debts of banks and with future short selling temporarily banned, share prices rapidly increased. The FTSE rose by a record 8.8 per cent on 19 September. Those with 'short positions' – i.e. those who had sold shares they had borrowed – then had to buy them back at a much higher price. Losses of hundreds of millions of pounds were made by short sellers. But they gained little sympathy from the general public, who blamed their 'greed' for much of the falls in share prices of the previous weeks.

1. *Why would owners of shares, such as pension funds, lend them to short sellers rather than selling the shares themselves and then buying them back later?*
2. *What are the potential benefits of short selling for the economy?*
3. *'Naked' short selling has been banned in many countries. What exactly is naked short selling?*

Undertake desktop research on the positions taken by different countries in relation to short selling. Summarise your findings.

Definition

Short selling (or shorting) Where investors borrow an asset, such as shares, oil contracts or foreign currency; sell the asset, hoping the price will soon fall; then buy it back later and return it to the lender. Assuming the price has fallen, the short seller will make a profit of the difference (minus any fees). There is always the danger, however, that the price may have risen, in which case the short seller will make a loss.

BOX 2.8   DEALING IN FUTURES MARKETS

A way of reducing uncertainty

One way of reducing or even eliminating uncertainty is by dealing in *futures or forward markets*. Let us examine first the activities of sellers and then those of buyers.

Sellers

Suppose you are a farmer and want to store grain to sell at some time in the future, expecting to get a better price then than now. The trouble is that there is a chance that the price will go down. Given this uncertainty, you may be unwilling to take a gamble.

An answer to your problem is provided by the *commodity futures market*. This is a market where prices are agreed between sellers and buyers today for delivery at some specified date in the future.

For example, if it is 20 October today, you could be quoted a price today for delivery in six months' time (i.e. on 20 April). This is known as the six-month *future price*. Assume that the six-month future price is £160 per tonne. If you agree to this price and make a six-month forward contract, you are agreeing to sell a specified amount of wheat at £160 on 20 April. No matter what happens to the *spot price* (i.e. the current market price) in the meantime, your selling price has been agreed. The spot price could have fallen to £140 (or risen to £180) by April, but your selling price when 20 April arrives is fixed at £160. There is thus *no risk to you whatsoever of the price going down*. You will, of course, have lost out if the spot price is *more* than £160 in April.

Buyers

Now suppose that you are a flour miller. In order to plan your expenditures, you would like to know the price you will have to pay for wheat, not just today, but also at various future dates. In other words, if you want to take delivery of wheat at some time in the future, you would like a price quoted *now*. You would like the risks removed of prices going *up*.

Let us assume that today (20 October) you want to *buy* the same amount of wheat on 20 April that a farmer wishes to sell on that same date. If you agree to the £160 future price, a future contract can be made with the farmer. You are then guaranteed that purchase price, no matter what happens to the spot price in the meantime. There is thus *no risk to you whatsoever of the price going up*. You will, of course, have lost out if the spot price is *less* than £160 in April.

The determination of the future price

Prices in the futures market are determined in the same way as in other markets: by demand and supply. For example, the six-month wheat price or the three-month coffee price will be that which equates the demand for those futures with the supply. If the five-month sugar price is currently £220 per tonne and people expect by then, because of an anticipated good beet harvest, that the spot price for sugar will be £170 per tonne, there will be few who want to buy the futures at £220 (and many who want to sell). This excess of supply of futures over demand will push the price down.

Speculators

Many people operate in the futures market who never actually handle the commodities themselves. They are neither producers nor users of the commodities. They merely speculate. Such speculators may be individuals, but they are more likely to be financial institutions.

Let us take a simple example. Suppose that the six-month (April) coffee price is £1300 per tonne and that you, as a speculator, believe that the spot price of coffee is likely to rise above that level between now (October) and six months' time. You thus decide to buy 20 tonnes of April coffee futures now.

But you have no intention of taking delivery. After four months, let us say, true to your prediction, the spot price (February) has risen and as a result the April price (and other future prices) have risen too. You thus decide to *sell* 20 tonnes of April (two-month) coffee futures, whose price, let us say, is £1500. You are now 'covered'.

When April comes, what happens? You have agreed to buy 20 tonnes of coffee at £1300 per tonne and to sell 20 tonnes of coffee at £1500 per tonne. All you do is to hand the futures contract to buy to the person to whom you agreed to sell. They sort out delivery between them and you make £200 per tonne profit.

If, however, your prediction had been wrong and the price had *fallen,* you would have made a loss. You would have been forced to sell coffee contracts at a lower price than you bought them.

Speculators in the futures market thus incur risks, unlike the sellers and buyers of the commodities, for whom the futures market eliminates risk. Financial institutions offering futures contracts will charge for the service: for taking on the risks.

If speculators believed that the price of cocoa in six months was going to be below the six-month future price quoted today, how would they act?

Choose three commodities and find out their spot price and their future prices for three different dates. Explain the difference in prices.

Definitions

Futures or forward market A market in which contracts are made to buy or sell at some future date at a price agreed today.

Future price A price agreed today at which an item (e.g. commodities) will be exchanged at some set date in the future.

Spot price The current market price.

Section summary

1. A complete understanding of markets must take into account the time dimension.

2. Given that producers and consumers take a time to respond fully to price changes, we can identify different equilibria after the lapse of different lengths of time. Generally, short-run supply and demand tend to be less price elastic than long-run supply and demand. As a result, any shifts in *D* or *S* curves tend to have a relatively bigger effect on price in the short run and a relatively bigger effect on quantity in the long run.

3. People often anticipate price changes and this will affect the amount they demand or supply. This speculation will tend to stabilise price fluctuations if people believe that the price changes are only temporary. However, speculation will tend to destabilise these fluctuations (i.e. make them more severe) if people believe that prices are likely to continue to move in the same direction as at present (at least for some time).

4. Many economic decisions are taken under conditions of risk or uncertainty. Uncertainty over future prices can be tackled by holding stocks. When prices are low, the stocks can be built up. When they are high, stocks can be sold.

END OF CHAPTER QUESTIONS

1. The weekly demand and supply schedules for T-shirts (in millions) in a free market are as follows:

Price (£)	8	7	6	5	4	3	2	1
Quantity demanded	6	8	10	12	14	16	18	20
Quantity supplied	18	16	14	12	10	8	6	4

   (a) What are the equilibrium price and quantity?

   (b) Assume that changes in fashion cause the demand for T-shirts to rise by 4 million at each price. What will be the new equilibrium price and quantity? Has equilibrium quantity risen as much as the rise in demand? Explain why or why not.

   (c) Now plot the data in the table and mark the equilibrium. Also plot the new data corresponding to (b).

2. On separate demand and supply diagrams for bread, sketch the effects of the following: (a) a rise in the price of wheat; (b) a rise in the price of butter and margarine; (c) a rise in the price of rice, pasta and potatoes. In each case, state your assumptions.

3. For what reasons might the price of overseas holidays rise? In each case, identify whether these are reasons affecting demand, supply, or both.

4. If both demand and supply change, and if we know which direction they have shifted but not how much, why are we able to predict the direction in which *either* price *or* quantity will change, but not both? (Clue: consider the four possible combinations and sketch them if necessary: (a) *D* left, *S* left; (b) *D* right, *S* right; (c) *D* left, *S* right; (d) *D* right, *S* left.)

5. If you were the owner of a clothes shop, how would you set about deciding what prices to charge for each garment at the end-of-season sale?

6. Is there any truth in the saying that the price of a good is a reflection of its quality?

7. Assume that oil begins to run out and that extraction becomes more expensive. Trace through the effects of this on the market for oil and the market for other fuels.

8. Why are both the price elasticity of demand and the price elasticity of supply likely to be greater in the long run?

9. Which of the following will have positive signs and which will have negative ones: (a) price elasticity of demand; (b) income elasticity of demand (normal good); (c) income elasticity of demand (inferior good); (d) cross elasticity of demand (with respect to changes in price of a substitute good); (e) cross elasticity of demand (with respect to changes in price of a complementary good); (f) price elasticity of supply?

10. What are the advantages and disadvantages of speculation from the point of view of (a) the consumer; (b) firms?

Online resources

Additional case studies on the student website

2.1 **The demand for lamb.** An investigation of a real-world demand function.

2.2 **Adjusting to oil price shocks.** A case study showing how demand and supply analysis can be used to examine the price changes in the oil market since 1973.

2.3 **Coffee prices.** An examination of the coffee market and the implications of fluctuations in the coffee harvest for growers and coffee drinkers.

2.4 **Shall we put up our price?** This uses the concept of price elasticity of demand to explain why prices are higher where firms face little or no competition.

2.5 **Response to changes in petrol and ethanol prices in Brazil.** This case examines how drivers with 'flex-fuel' cars responded to changes in the relative price of two fuels: petrol and ethanol (made from sugar cane).

2.6 **Income elasticity of demand and the balance of payments.** This examines how a low income elasticity of demand for the exports of many developing countries can help to explain their chronic balance of payments problems.

2.7 **The role of the speculator.** This assesses whether the activities of speculators are beneficial or harmful to the rest of society.

Maths Case 2.1 Finding equilibrium price and quantity using algebra. This gives an example of solving equilibrium price and quantity from a demand and a supply equation using the method of simultaneous equations.

Maths Case 2.2 Calculating income and cross-price elasticities from a demand equation: a worked example (Part 1: not using calculus). This gives an example of working out cross and income elasticities from a particular demand function.

Maths Case 2.3 Calculating income and cross-price elasticities from a demand equation: a worked example (Part 2: using calculus). This shows how simple differentiation can be used to work out elasticity values. It gives an example of working out cross and income elasticities from a particular demand function.

Websites relevant to this chapter

Numbers and sections refer to websites listed in the Web Appendix and hotlinked from this book's website at **go.pearson.com/uk/sloman.**

- For news articles relevant to this chapter, see the *Economics News* section on the student website.
- For general news on markets, see websites in section A, and particularly A1–9, 23–6, 35, 36. See also links to newspapers worldwide in A38, 39, 43 and 44, and the news search feature in Google at A41.
- For links to sites on markets, see the relevant sections of I7, 13 and 14.
- For data on the housing market (Box 2.1), see sites B7–11.
- For sites favouring the free market, see C17 and E34.
- For student resources relevant to this chapter, see sites C1–10, 19, 28.
- For a range of classroom games and simulations of markets, see sites C23, 24 and 27 (computer-based) and C20 (non-computer-based).