

7TH ASIA-PACIFIC EDITION

PRINCIPLES OF MICROECONOMICS

JOSHUA GANS STEPHEN KING MARTIN BYFORD N GREGORY MANKIW



To
Belanna, Ariel and Annika
Jacqueline and Rebecca
Robert
Catherine, Nicholas and Peter

7TH ASIA-PACIFIC EDITION

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JOSHUA GANS STEPHEN KING MARTIN BYFORD N GREGORY MANKIW

Principles of Microeconomics

7th Edition

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Guide to the text

As you read this text you will find a number of features in every chapter to enhance your study of Microeconomics and help you understand how the theory is applied in the real world.

PART OPENING FEATURES

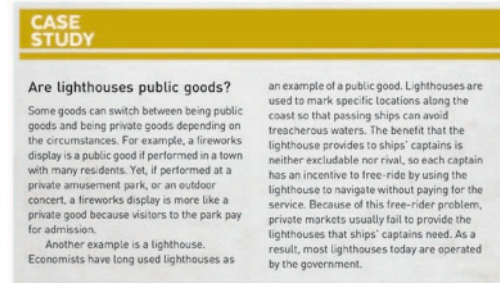
CHAPTER LIST

Chapter list outlines the chapters contained in each part for easy reference.



CASE STUDIES

Analyse practical applications of concepts through the **Case studies**.



CHAPTER OPENING FEATURES

LEARNING OBJECTIVES

Identify the key concepts that the chapter will cover with the **Learning objectives** at the start of each chapter.



THINK BOXES

Gain insights into recent policy issues using data from Economics Society of Australia with the **What Australian economists think boxes**.

What Australian economists think

Free trade is one of those issues on which a general consensus exists among economists. The vast majority of economists are convinced that free trade between nations is desirable – both because of the ‘gains from trade’ outlined in Chapter 3 and the increase in welfare described in this chapter. Indeed, the topic of international trade is an excellent example of where acquiring even a little economic understanding tends to result in significantly changed opinions. (Has this chapter changed the way you think about international trade?)

So strong is the advocating of free trade among Australian economists that, in the 2011 Economic Society of Australia survey, 56.5 per cent of respondents supported Australia unilaterally reducing all barriers to international trade, including subsidies, tariffs and quotas (26.6 per cent disagreed). In other words, a majority of those surveyed were in favour of dismantling barriers to free trade, regardless of whether or not our trading partners reciprocate.

FEATURES WITHIN CHAPTERS

KEY TERMS

Important **Key terms** are marked in bold in the text and defined in the **margin** when they are used in the text for the first time. A full list of key terms is also available in the glossary, which can be found at the back of the book.

In general, statements about the world are of two types. One type, such as Polly's, is positive. **Positive statements** are descriptive. They make a claim about how the world is. A second type of statement, such as Norma's, is normative. **Normative statements** are prescriptive. They make a claim about how the world ought to be.

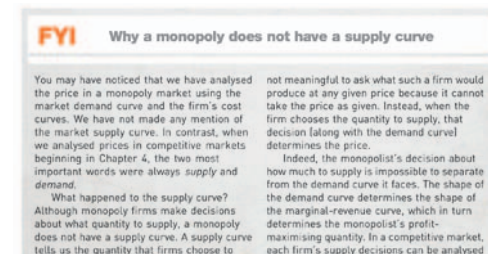
A key difference between positive and normative statements is how we judge their validity. We can, in principle, confirm or refute positive statements by examining evidence. An economist might evaluate Polly's statement by analysing data on changes in minimum wages and changes in unemployment over time. In contrast, evaluating normative statements involves values as well as facts. Norma's statement cannot be judged using data alone. Deciding what is good or bad policy is not merely a matter of science. It also involves our views on ethics, religion and political

positive statements claims that attempt to describe the world as it is

normative statements claims that attempt to prescribe how the world should be

FYI BOXES

Useful microeconomic facts can be found in the **FYI boxes**. They will provide you with additional information and material to support key concepts within each chapter.



IN THE NEWS

Expand your knowledge of economics related to contemporary events **In the News**. These boxes provide contemporary news articles about economics in the real world.

IN THE NEWS Why do Australians pay more for digital downloads?

The price of digital downloads of software, music, movies and TV shows is often considerably higher in Australia than in the United States. Internet suppliers use a technology known as 'geo-blocking' to prevent buyers in one country from accessing products for sale in another country, giving them the ability to price discriminate. In 2013, three of the world's biggest tech companies fronted a parliamentary inquiry to explain why they price discriminate. What do you think of their responses?

'Evasive': Microsoft, Adobe fail to justify prices
by Asher Moses

Ms Marlow said: 'If we price our products too high our customers will vote with their wallets and we will see our sales decline.'

QUIZ QUESTIONS

Challenge the theory you have learned by considering the **Quiz questions**, perhaps in group discussion.

QUIZ

In what sense is economics like a science? Draw a production possibilities frontier for a society that produces food and clothing. Show an efficient point, an inefficient point and an infeasible point. Show the effects of a drought. Define microeconomics and macroeconomics.

END-OF-CHAPTER FEATURES

At the end of each chapter you will find several tools to help you to review, practise and extend your knowledge of the key learning objectives.

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A	20 items	112
B	10	50
C	10	50

Summary

- When a monopoly business is given a price ceiling, it will reduce its price, but it will not necessarily be an efficient price. A monopoly business, like a perfectly competitive business, has the ability to price discriminate. An average price is not necessarily an efficient price. A price ceiling will reduce the quantity of goods sold from the monopoly business.
- Monopolies are given a price ceiling to reduce the deadweight loss. A price ceiling will reduce the deadweight loss, but it will not necessarily be an efficient price. A price ceiling will reduce the deadweight loss, but it will not necessarily be an efficient price. A price ceiling will reduce the deadweight loss, but it will not necessarily be an efficient price.

For review

Read a newspaper or magazine and find a positive externality. Write a short paragraph to explain the benefits of a positive externality. How can a positive externality be internalized? Write a short paragraph to explain the benefits of a positive externality. How can a positive externality be internalized?

Problems and applications

- Consider a market for good X. The demand curve is downward sloping and the supply curve is upward sloping. The equilibrium price is \$10 and the equilibrium quantity is 100. Suppose the government imposes a tax of \$2 per unit. What is the new equilibrium price and quantity? What is the deadweight loss of the tax?
- Suppose the government imposes a tax of \$2 per unit. What is the new equilibrium price and quantity? What is the deadweight loss of the tax?
- Suppose the government imposes a tax of \$2 per unit. What is the new equilibrium price and quantity? What is the deadweight loss of the tax?

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PREFACE TO THIS EDITION

Studying economics should invigorate and enthral. It should challenge students' preconceptions and provide them with a powerful, coherent framework for analysing the world they live in. Yet, all too often, economics textbooks are dry and confusing. Rather than highlighting the important foundations of economic analysis, these books focus on the 'ifs' and 'buts'. The motto underlying this book is that it is 'the rule, not the exception' that is important. Our aim is to show the power of economic tools and the importance of economic ideas.

This book has been designed particularly for students in Australia and New Zealand. However, we are keenly aware of the diverse mix of students studying in these countries. When choosing examples and applications, we have kept an international focus. Whether the issue is sauce tariffs in the EU, rent control in Mumbai, road tolls in Singapore or the gas industry in Australia, examples have been chosen for their relevance and to highlight that the same economic questions are being asked in many countries. The specific context in which economics is applied may vary, but the lessons and insights offered by the economic way of thinking are universal.

To boil economics down to its essentials, we had to consider what is truly important for students to learn in their first course in economics. As a result, this book differs from others not only in its length but also in its orientation.

It is tempting for professional economists writing a textbook to take the economist's point of view and to emphasise those topics that fascinate them and other economists. We have done our best to avoid that temptation. We have tried to put ourselves in the position of students seeing economics for the first time. Our goal is to emphasise the material that students should and do find interesting about the study of the economy.

One result is that more of this book is devoted to applications and policy, and less is devoted to formal economic theory, than is the case with many other books written for the principles course. For example, after students learn about the market forces of supply and demand in Chapters 4 to 6, they immediately apply these tools in Chapters 7 to 9 to consider three important questions facing our society: Why is the free market a good way to organise economic activity? How does taxation interfere with the market mechanism? Who are the winners and losers from international trade? These kinds of questions resonate with the concerns and interests that students hear about in the news and bring from their own lives.

Throughout this book, we have tried to return to applications and policy questions as often as possible. Most chapters include case studies illustrating how the principles of economics are applied. In addition, 'In the news' boxes offer excerpts from newspaper and magazine articles showing how economic ideas shed light on the current issues facing society. It is our hope that after students finish their first course in economics, they will think about news stories from a new perspective and with greater insight.

To write a brief and student-friendly book, we had to consider new ways to organise the material. This book includes all the topics that are central to a first course in economics, but the topics are not always arranged in the traditional order. What follows is a whirlwind tour of this text. This tour will, we hope, give instructors some sense of how the pieces fit together.

Chapter 1, 'Ten principles of economics', introduces students to the economist's view of the world. It previews some of the big ideas that recur throughout economics, such as opportunity cost, marginal decision making, the role of incentives, the gains from trade and the efficiency of market allocations. Throughout the book, we refer regularly to the *Ten Principles of Economics* in Chapter 1 to remind students that these principles are the foundation for most economic analysis. A key icon in the margin calls attention to these references.

Chapter 2, 'Thinking like an economist', examines how economists approach their field of study. It discusses the role of assumptions in developing a theory and introduces the concept of an economic model. It also discusses the role of economists in making policy. The appendix to this chapter offers a brief refresher course on how graphs are used and how they can be abused.

Chapter 3, 'Interdependence and the gains from trade', presents the theory of comparative advantage. This theory explains why individuals trade with their neighbours, and why nations trade with other nations. Much of economics is about the coordination of economic activity through market forces. As a starting point for this analysis, students see in this chapter why economic interdependence can benefit everyone. This is done using a familiar example of trade in household chores among flatmates.

The next three chapters introduce the basic tools of supply and demand. Chapter 4, 'The market forces of supply and demand', develops the supply curve, the demand curve and the notion of market equilibrium. Chapter 5, 'Elasticity and its application', introduces the concept of elasticity and uses it in three applications to quite different markets. Chapter 6, 'Supply, demand and government policies', uses these tools to examine price controls, such as rent control, the award wage system, tax incidence and subsidies.

Attention then turns to welfare analysis using the tools of supply and demand. Chapter 7, 'Consumers, producers and the efficiency of markets', extends the analysis of supply and demand using the concepts of consumer surplus and producer surplus. It begins by developing the link between consumers' willingness to pay and the demand curve and the link between producers' costs of production and the supply curve. It then shows that the market equilibrium maximises the sum of the producer and consumer surplus. In this book, students learn about the efficiency of market allocations early in their studies.

The next two chapters apply the concepts of producer and consumer surplus to questions of policy. Chapter 8, 'Application: The costs of taxation', examines the deadweight loss of taxation. Chapter 9, 'Application: International trade', examines the winners and losers from international trade and the debate about protectionist trade policies.

Having examined why market allocations are often desirable, the book then considers how the government can sometimes improve on market allocations. Chapter 10, 'Externalities', examines why external effects such as pollution can render market outcomes inefficient. It also examines the possible public and private solutions to those inefficiencies. This has become highly relevant as policymakers attempt to deal with mitigating the causes of climate change. Chapter 11, 'Public goods and common resources', considers the inefficiencies that arise for goods that have no market price, such as national defence. Chapter 12, 'The design of the tax system', examines how the government raises the revenue

necessary to pay for public goods. It presents some institutional background about the tax system and then discusses how the goals of efficiency and equity come into play in the design of a tax system.

The next six chapters examine firm behaviour and industrial organisation. Chapter 13, 'The costs of production', discusses what to include in a firm's costs and introduces cost curves. Chapter 14, 'Firms in competitive markets', analyses the behaviour of price-taking firms and derives the market supply curve. Chapter 15, 'Monopoly', discusses the behaviour of a firm that is the sole seller in its market. It discusses the inefficiency of monopoly pricing and the value of price discrimination. Chapter 16, 'Monopolistic competition', examines behaviour in a market in which many sellers offer similar but differentiated products. It also discusses the debate about the effects of advertising. Chapter 17, 'Oligopoly and business strategy', examines markets when there are only a few sellers and so strategic interactions are important. It uses the prisoners' dilemma as the model for examining strategic interaction. Chapter 18, 'Competition policy', describes the policy instruments used by governments to control monopoly power and preserve competition in markets.

Microeconomic reform is discussed throughout the chapters on firm behaviour and industrial organisation rather than as a separate topic. For instance, the role of privatisation is included in Chapter 15, and competition and trade practices issues are discussed in Chapter 18. Also, note that Chapter 17 includes an appendix that can be used to teach students about the differences between price and quantity competition in oligopoly. This appendix makes the latest game-theoretic thinking on these issues accessible to introductory economics students.

The next three chapters examine issues related to labour markets. Chapter 19, 'The markets for the factors of production', emphasises the link between factor prices and marginal productivity. It includes an appendix on the firm demand for labour under imperfect competition and monopoly. Chapter 20, 'Earnings and discrimination', discusses the determinants of equilibrium wages, including compensating differentials, human capital, unions, efficiency wages and discrimination. The union discussion goes beyond simplistic analyses of unions and monopolists, introducing union behaviour as part of a bargaining equilibrium in bilateral monopoly. The discussion of human capital and efficiency wages proves a convenient point to introduce students to the concepts of signalling and asymmetric information. Chapter 21, 'Income inequity and poverty,' examines the degree of inequality in Australian society, the alternative views about the government's role in changing the distribution of income, and the various policies aimed at helping society's poorest members.

Chapter 22, 'The theory of consumer choice', analyses individual decision making using budget constraints and indifference curves. Finally, Chapter 23, 'Frontiers of microeconomics', goes beyond standard microeconomics to examine cutting-edge issues such as the role of information, political economy and behavioural economics; all of which help explain more of what happens in the real world. These last two chapters cover material that is somewhat more advanced than the rest of the book. Some instructors may want to skip the last chapter, depending on the emphases of their courses and the interests of their students. Instructors who do cover this material may want to move it earlier, and we have written this chapter so that it can be covered any time after the basics of supply and demand have been introduced.

Joshua S. Gans
Stephen P. King
Martin C. Byford

PREFACE TO THE ORIGINAL EDITION

During my twenty-year career as a student, the course that excited me most was the two-semester sequence on the principles of economics I took during my freshman year in college. It is no exaggeration to say that it changed my life.

I had grown up in a family that often discussed politics over the dinner table. The pros and cons of various solutions to society's problems generated fervent debate. But, in school, I had been drawn to the sciences. Whereas politics seemed vague, rambling and subjective, science was analytic, systematic and objective. While political debate continued without end, science made progress.

My freshman course on the principles of economics opened my eyes to a new way of thinking. Economics combines the virtues of politics and science. It is, truly, a social science. Its subject matter is society – how people choose to lead their lives and how they interact with one another. But it approaches its subject with the dispassion of a science. By bringing the methods of science to the questions of politics, economics tries to make progress on the fundamental challenges that all societies face.

I was drawn to write this book in the hope that I could convey some of the excitement about economics that I felt as a student in my first economics course. Economics is a subject in which a little knowledge goes a long way. (The same cannot be said, for instance, of the study of physics or the Japanese language.) Economists have a unique way of viewing the world, much of which can be taught in one or two semesters. My goal in this book is to transmit this way of thinking to the widest possible audience and to convince readers that it illuminates much about the world around them.

I am a firm believer that everyone should study the fundamental ideas that economics has to offer. One of the purposes of general education is to make people more informed about the world in order to make them better citizens. The study of economics, as much as any discipline, serves this goal. Writing an economics textbook is, therefore, a great honour and a great responsibility. It is one way that economists can help promote better government and a more prosperous future. As the great economist Paul Samuelson put it, 'I don't care who writes a nation's laws, or crafts its advanced treaties, if I can write its economics textbooks.'

N. Gregory Mankiw

July 2000

TO THE STUDENTS

'Economics is a study of mankind in the ordinary business of life.' So wrote Alfred Marshall, the great nineteenth-century economist, in his textbook *Principles of Economics*. Although we have learned much about the economy since Marshall's time, this definition of economics is as true today as it was in 1890, when the first edition of his text was published.

Why should you, as a student entering the twenty-first century, embark on the study of economics? There are three reasons.

The first reason to study economics is that it will help you understand the world in which you live. There are many questions about the economy that might spark your curiosity. Why are houses more expensive in Sydney than in Hobart? Why do airlines charge less for a return ticket if the traveller stays over a Saturday night? Why are some people paid so much to play tennis? Why are living standards so meagre in many African countries? Why do some countries have high rates of inflation while others have stable prices? Why are jobs easy to find in some years and hard to find in others? These are just a few of the questions that a course in economics will help you answer.

The second reason to study economics is that it will make you a more astute participant in the economy. As you go about your life, you make many economic decisions. While you are a student, you decide how many years you will continue with your studies. Once you take a job, you decide how much of your income to spend, how much to save and how to invest your savings. Someday you may find yourself running a small business or a large corporation, and you will decide what prices to charge for your products. The insights developed in the coming chapters will give you a new perspective on how best to make these decisions. Studying economics will not by itself make you rich, but it will give you some tools that may help in that endeavour.

The third reason to study economics is that it will give you a better understanding of the potential and limits of economic policy. As a voter, you help choose the policies that guide the allocation of society's resources. When deciding which policies to support, you may find yourself asking various questions about economics. What are the burdens associated with alternative forms of taxation? What are the effects of free trade with other countries? What is the best way to protect the environment? How does a government budget deficit affect the economy? These and similar questions are always on the minds of policymakers, whether they work for a local council or the prime minister's office.

Thus, the principles of economics can be applied in many of life's situations. Whether the future finds you reading the newspaper, running a business or running a country, you will be glad that you studied economics.

Joshua S. Gans

Stephen P. King

Martin C. Byford

N. Gregory Mankiw

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Joshua Gans holds the Jeffrey S. Skoll Chair in Technical Innovation and Entrepreneurship and is a Professor of Strategic Management at the Rotman School of Management, University of Toronto. He studied economics at the University of Queensland and Stanford University. He currently teaches digital economics and entrepreneurship to MBA students. Professor Gans's research ranges over many fields of economics, including economic growth, game theory, regulation and the economics of technological change and innovation. His work has been published in academic journals including the *American Economic Review*, *Journal of Economic Perspectives*, *Journal of Political Economy* and the *Rand Journal of Economics*. Joshua also has written the popular books *Parentonomics* (published by MIT Press) and *Information Wants to be Shared* (published by Harvard Business School Press) and founded the Core Economics blog (economics.com.au). Currently, he is an associate editor at *Management Science* and the *Journal of Industrial Economics*. He has also undertaken consulting activities (through his consulting firm, CoRE Research), advising governments and private firms on the impact of microeconomic reform and competition policy in Australia. In 2007, he was awarded the Economic Society of Australia's Young Economist Award for the Australian economist under 40 who has made the most significant contribution to economic knowledge. In 2008, he was elected as a Fellow of the Academy of Social Sciences Australia.

Professor Gans lives in Toronto with his partner, Natalie Lippey, and children, Belanna, Ariel and Annika.

Stephen King is a Commissioner with Australia's Productivity Commission and an adjunct Professor of Economics at Monash University. He has previously been Dean of Business and Economics at Monash University, a member of the Economic Regulation Authority of Western Australia, a member of the National Competition Council and a Commissioner at the Australian Competition and Consumer Commission. After starting (and stopping) studying Forestry and Botany, Stephen completed an economics degree at the Australian National University. He completed his PhD at Harvard University in 1991. Stephen has taught a variety of courses, including teaching introductory economics for 11 years at Harvard University, Monash University and the University of Melbourne.

Professor King has researched and published in a wide range of areas, including law and economics, game theory, corporate finance, privatisation and tax policy. From 2012 to 2016, he had a regular column in *The Conversation* and he has a YouTube channel where you can view companion videos for introductory economics. Stephen regularly provides advice to government, private firms and the Courts on a range of issues relating to regulation and competition policy. He is a Lay Member of the High Court of New Zealand and a Fellow of the Academy of Social Sciences in Australia.

Professor King lives in Melbourne with his wife, Mary. Their two children, Jacqui and Rebecca, have grown up, graduated, and run away from home.

Martin Byford is Senior Lecturer of Economics at RMIT University. Prior to joining RMIT, he was Assistant Professor of Economics at the University of Colorado at Boulder. Martin discovered economics during the final year of a combined Arts and Civil Engineering degree. Realising that he had made a terrible error in his choice of vocation, Martin went back to university to study economics. He completed a PhD at the University of Melbourne in 2007. Martin has taught introductory microeconomics at RMIT campuses in Australia and Singapore.

Dr Byford's research is primarily in the fields of industrial organisation and microeconomic theory. He has published in academic journals including the *Journal of Economic Theory*, the *International Journal of Industrial Organization* and the *Journal of Economics and Management Strategy*. Martin also contributes to economic policy debates on a diverse range of topics, including the design of the banking system and labour market reform.

Dr Byford lives in Melbourne with his wife, Siobhan, and their son, Robert.

N. Gregory Mankiw is Professor of Economics at Harvard University. As a student, he studied economics at Princeton University and MIT. As a teacher, he has taught macroeconomics, microeconomics, statistics and principles of economics. He even spent one summer long ago as a sailing instructor on Long Beach Island.

Professor Mankiw is a prolific writer and a regular participant in academic and policy debates. His work has been published in scholarly journals, such as the *American Economic Review*, *Journal of Political Economy* and *Quarterly Journal of Economics*, and in more popular forums, such as *The New York Times*, *Boston Globe* and *The Wall Street Journal*. He is also the author of the best-selling intermediate-level textbook *Macroeconomics* (Worth Publishers). In addition to his teaching, research and writing, Professor Mankiw is a research associate of the National Bureau of Economic Research, an adviser to the Federal Reserve Bank of Boston and the Congressional Budget Office, and a member of the ETS test development committee for the advanced placement exam in economics.

Professor Mankiw lives in Wellesley, Massachusetts, with his wife and three children.

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PART ONE



Introduction

- Chapter 1** Ten principles of economics
- Chapter 2** Thinking like an economist
- Chapter 3** Interdependence and the gains from trade

1

Ten principles of economics

Learning objectives

In this chapter you will:

- learn that economics is about the allocation of scarce resources
- examine some of the trade-offs that people face
- learn the meaning of opportunity cost
- see how to use marginal reasoning when making decisions
- discuss how incentives affect people's behaviour
- consider why trade among people or nations can be good for everyone
- discuss why markets are a good, but not perfect, way to allocate resources
- learn what determines some trends in the overall economy.

The word *economy* comes from the Greek word *oikonomos*, which means ‘one who manages a household’. At first, this origin might seem peculiar. But, in fact, households and economies have much in common.

A household faces many decisions. It must decide which members of the household do which tasks and what each member receives in return. Who cooks dinner? Who does the laundry? Who gets the extra dessert at dinner? Who gets to use the car? In short, the household must allocate its scarce resources (time, dessert, petrol) among its various members, taking into account each member’s abilities, efforts and desires.

Like a household, a society faces many decisions. A society must decide what jobs will be done and who will do them. It needs some people to grow food, other people to make clothing and still others to design computer software. Once society has allocated people (as well as land, buildings and machines) to various jobs, it must also allocate the output of the goods and services that they produce. It must decide who will eat caviar and who will eat potatoes. It must decide who will drive a Tesla, and who will take the bus.

The management of society’s resources is important because resources are scarce. **Scarcity** means that society has limited resources and therefore cannot produce all the goods and services people wish to have. Just as each member of a household cannot get everything he or she wants, each individual in society cannot attain the highest standard of living to which he or she might aspire.

Economics is the study of how society manages its scarce resources. In most societies, resources are allocated not by an all-powerful dictator but through the combined choices of millions of households and firms. Economists, therefore, study how people make decisions – how much they work, what they buy, how much they save and how they invest their savings. Economists also study how people interact with one another. For instance, they examine how the buyers and sellers of a good interact to determine the price at which the good is sold and the quantity that is sold. Finally, economists analyse the forces and trends that affect the economy as a whole, including the growth in average income, the fraction of the population that cannot find work and the rate at which prices are rising.

The study of economics has many facets, but it is unified by several central ideas. In the rest of this chapter, we look at *Ten Principles of Economics*. Don’t worry if you don’t understand them all at first or if you are not completely convinced. We explore these ideas more fully in later chapters. The 10 principles are introduced here to give you an overview of what economics is all about.

scarcity
the limited nature of society’s resources

economics
the study of how society manages its scarce resources

How people make decisions

There is no mystery about what an ‘economy’ is. Whether we are talking about the economy of Sydney, of Australia or of the whole world, an economy is just a group of people interacting with one another as they go about their lives. Because the behaviour of an economy reflects the behaviour of the individuals who make up the economy, we begin our study of economics with four principles of individual decision making.

Principle 1: People face trade-offs

You may have heard the saying ‘There’s no such thing as a free lunch’. To get something that we like, we usually have to give up something else that we also like. Making decisions requires trading off one goal against another.

Consider a student who must decide how to allocate her most valuable resource – her time. She can spend all her time studying economics; she can spend all of her time studying psychology; or she can divide her time between the two fields. For every hour she studies one subject, she gives up an hour she could have used studying the other. And for every hour she spends studying, she gives up an hour that she could have spent sleeping, bike riding, watching YouTube clips, or working at her part-time job for some extra spending money.

Consider parents deciding how to spend their family income. They can buy food or clothing, or have a holiday. Or they can save some of the family income for retirement or the children's education. When they choose to spend an extra dollar on one of these goods, they have one less dollar to spend on some other good.

When people are grouped into societies, they face different kinds of trade-offs. The classic trade-off is between 'guns and butter'. The more we spend on defence to protect our shores from foreign aggressors (guns), the less we can spend on personal goods to raise our standard of living at home (butter). Also important in modern society is the trade-off between a clean environment and a high level of income. Laws that require firms to reduce pollution usually raise the cost of producing goods and services. Because of these higher costs, these firms end up earning smaller profits, paying lower wages, charging higher prices or some combination of these three. Thus, while pollution regulations give us the benefit of a cleaner environment and the improved health that comes with it, they have the cost of reducing the incomes of the regulated firms' owners, workers and customers.

Another trade-off society faces is between efficiency and equity. **Efficiency** means that society is getting the most it can from its scarce resources. **Equity** means that the benefits of those resources are distributed fairly among society's members. In other words, efficiency refers to the size of the economic pie, and equity refers to how the pie is divided. Often, when government policies are being designed, these two goals conflict.

Consider, for instance, policies aimed at achieving a more equitable distribution of economic wellbeing. Some of these policies, such as the age pension or unemployment benefits, try to help those members of society who are most in need. Others, such as the individual income tax, ask the financially successful to contribute more than others to support the government. Although these policies have the benefit of achieving greater equity, they have a cost in terms of reduced efficiency. When the government redistributes income from the rich to the poor, it can reduce the reward for working hard; as a result, people may work less and produce fewer goods and services. In other words, as the government tries to cut the economic pie into more equitable slices, the pie may get smaller.

Recognising that people face trade-offs does not by itself tell us what decisions they will or should make. A student should not abandon the study of psychology just because doing so would increase the time available for the study of economics. Society should not stop protecting the environment just because environmental regulations reduce our material standard of living. The poor should not be ignored just because helping them distorts work incentives. Nonetheless, acknowledging life's trade-offs is important because people are likely to make good decisions only if they understand the options that they have available. Our study of economics starts by acknowledging life's trade-offs.

Principle 2: The cost of something is what you give up to get it

Because people face trade-offs, making decisions requires comparing the costs and benefits of alternative courses of action. In many cases, however, the cost of some action is not as obvious as it might first appear.

efficiency

the property of society getting the most it can from its scarce resources

equity

the property of distributing economic prosperity fairly among the members of society

Consider, for example, the decision whether to go to university. The benefits include intellectual enrichment, and a lifetime of better job opportunities. But what is the cost? To answer this question, you might be tempted to add up the money you or your parents spend on fees, books, rent and food. Yet this total does not truly represent what you give up to spend a year at university.

There are two problems with this calculation. First, it includes some things that are not really costs of university education. Even if you quit university, you would need a place to sleep and food to eat. Rent and food are costs of going to university only to the extent that they may be more expensive because you are going to university. For instance, you might have to move cities to attend university, and live away from home.

Second, this calculation ignores the largest cost of going to university – your time. When you spend a year listening to lectures, reading textbooks and writing assignments, you cannot spend that time working at a job. For most students, the wages given up to attend university are the largest single cost of their education.

The **opportunity cost** of an item is the best alternative you give up to get that item. When making any decision, such as whether to attend university, decision makers should be aware of the opportunity costs that accompany each possible action. In fact, they usually are. For example, some young athletes can earn millions if they forgo university and play professional sports. Their opportunity cost of university is very high. It is not surprising that they often decide that the benefit of a university education is not worth the opportunity cost.

opportunity cost
the best alternative that must be given up to obtain some item

Principle 3: Rational people think at the margin

Economists normally assume that people are rational. Rational people systematically and purposefully do the best they can do to achieve their objectives, given the opportunities they have. As you study economics, you will encounter firms that decide how many workers to hire and how much of their product to manufacture and sell to maximise profits. You will encounter individuals who decide how much time to spend working, and what goods and services to buy with the resulting income to achieve the highest possible level of satisfaction.

Rational people know that decisions in life are rarely black and white but usually involve shades of grey. At dinnertime, the choice you face is not ‘Should I fast or eat like a pig?’. More likely you will be asking yourself ‘Should I eat that extra spoonful of mashed potatoes?’. When exams roll around, your decision is not between blowing them off and studying 24 hours a day, but whether to spend an extra hour reviewing your notes instead of updating your Facebook status. Economists use the term **marginal change** to describe a small incremental adjustment to an existing plan of action. Keep in mind that *margin* means ‘edge’, so marginal changes are adjustments around the edges of what you are doing. Rational people often make decisions by comparing *marginal benefits* and *marginal cost*.

marginal change
a small incremental adjustment to a plan of action

For example, suppose you are considering calling a friend on your mobile phone. You decide that talking with her for 10 minutes would give you a benefit that you value at about \$12. Your mobile phone plan costs you \$40 per month plus \$1 per minute for whatever calls you make. You usually talk for 100 minutes a month, so your total monthly bill is \$140 (\$1 per minute times 100 minutes, plus the \$40 fixed fee). Under these circumstances, should you make the call? You might be tempted to reason as follows: ‘Because I pay \$140 for 100 minutes of calling each month, the average minute on the phone costs me \$1.40. So a 10-minute call costs \$14. Because that \$14 cost is greater than the \$12 benefit, I am going to skip the call.’ That conclusion is wrong, however. Although the average cost of a 10-minute call is \$14, the marginal cost – the amount your bill

increases if you make the extra call – is only \$10. You will make the right decision only by comparing the marginal benefit and the marginal cost. Because the marginal benefit of \$12 is greater than the marginal cost of \$10, you should make the call. This is a principle that people innately understand: mobile phone users with unlimited calls (that is, phone calls that are free at the margin) are often prone to making long and frivolous calls.

Is the marginal benefit of this call greater than the marginal cost?



Source: Shutterstock.com/wavebreakmedia.

Thinking at the margin works for business decisions as well. Consider an airline deciding how much to charge passengers who fly standby. Suppose that flying a 200-seat plane from Brisbane to Perth costs the airline \$100 000. In this case, the average cost of each seat is $\$100\,000/200$, which is \$500. One might be tempted to conclude that the airline should never sell a ticket for less than \$500. But the airline can often increase its profits by thinking at the margin. Imagine that a plane is about to take off with 10 empty seats and a standby passenger waiting at the gate will pay \$300 for a seat. Should the airline sell the ticket? Of course it should. If the plane has empty seats, the cost of adding one more passenger is tiny. Although the *average* cost of flying a passenger is \$500, the *marginal* cost is merely the cost of the sandwich and coffee that the extra passenger will consume. As long as the standby passenger pays more than the marginal cost, selling the ticket is profitable.

Marginal decision making can help explain some otherwise puzzling economic phenomena. Here is a classic question: Why is water so cheap, while diamonds are so expensive? Humans need water to survive, while diamonds are unnecessary. Yet people are willing to pay much more for a diamond than for a cup of water. The reason is that a person's willingness to pay for a good is based on the marginal benefit that an extra unit of the good would yield. The marginal benefit, in turn, depends on how many units a person already has. Although water is essential, the marginal benefit of an extra cup is small because water is plentiful. By contrast, no one needs diamonds to survive, but because diamonds are so rare, people consider the marginal benefit of an extra diamond to be large.

A rational decision maker takes an action if and only if the marginal benefit of the action exceeds the marginal cost. This principle explains why people use mobile phones as much as they do, why airlines are willing to sell tickets below average cost and why people are willing to pay more for diamonds than for water. It can take some time to get used to the logic of marginal thinking, but the study of economics will give you ample opportunity to practise.

Principle 4: People respond to incentives

An incentive is something (such as the prospect of a punishment or reward) that induces a person to act. Because rational people make decisions by comparing costs and benefits, they respond to incentives. You will see that incentives play a central role in the study of economics. One economist went so far as to suggest that the entire field could be summarised simply: 'People respond to incentives. The rest is commentary.'

Incentives are key to analysing how markets work. For example, when the price of an apple rises, people decide to eat fewer apples. At the same time, apple orchards decide to hire more workers and harvest more apples. In other words, a higher price in a market provides an incentive for buyers to consume less and an incentive for sellers to produce more. As we will see, the influence of prices on the behaviour of consumers and producers is crucial to understanding how the economy allocates scarce resources.

Public policymakers should never forget about incentives. Many policies change the costs or benefits that people face and, as a result, alter their behaviour. A tax on petrol, for instance, encourages people to drive smaller, more fuel-efficient cars. That is one reason people drive smaller cars in Europe and Australia, where petrol taxes are higher, than in the United States, where petrol taxes are low. A petrol tax also encourages people to take public transportation rather than drive, and to live closer to where they work. If the tax were larger, more people would be driving hybrid cars, and if it were large enough, they would switch to electric cars.

When policymakers fail to consider how their policies affect incentives, they often end up facing unintended consequences. For example, consider public policy towards seat belts and car safety. In the 1950s, few cars had seat belts. Today all cars do, and in Australia it is compulsory to wear seat belts. The reason for the change is public policy. In the late 1960s, the rising death toll from motor vehicle accidents in Australia generated much public concern over car safety. State governments responded and in December 1970 the Victorian Government passed legislation requiring car drivers and passengers to wear seat belts. Other states followed and by 1973 it was compulsory throughout Australia to wear seat belts.

How does a seat belt law affect car safety? The direct effect is obvious. When wearing seat belts is compulsory, more people wear seat belts and the probability of surviving a major car accident rises. In this sense, seat belts save lives. This direct impact of seat belts on safety is what motivated Australian governments to change the law.

But that is not the end of the story because the law also affects behaviour by changing incentives. In this case, the relevant behaviour is the speed and care with which drivers operate their cars. Driving slowly and carefully is costly because it uses the driver's time and energy. When deciding how safely to drive, rational people compare the marginal benefit from safer driving with the marginal cost. They drive more slowly and carefully when the benefit of increased safety is high. This explains why people drive more slowly and carefully when roads are wet and slippery than when roads are clear.

Now consider how a seat belt law alters a driver's cost-benefit calculation. Seat belts make accidents less costly because they reduce the probability of injury or death. In other words,