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**PRINCIPLES
OF
MICROECONOMICS**

Joshua Gans
Stephen King
Martin Byford
N Gregory Mankiw

6th Edition

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To

Belanna, Ariel and Annika

Jacqueline and Rebecca

Robert

Catherine, Nicholas and Peter

micro

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Joshua Gans

Stephen King

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Principles of microeconomics**6th Edition****Joshua Gans****Stephen King****Martin Byford****N. Gregory Mankiw**

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BRIEF CONTENTS

Preface to this edition	xx	
Preface to the original edition	xxiii	
To the students	xxiv	
About the authors	xxv	
Acknowledgements	xxvii	
Resources guide	xxviii	
Part 1	Introduction	1
Chapter 1	Ten lessons from economics	2
Chapter 2	Thinking like an economist	21
Chapter 3	Interdependence and the gains from trade	49
Part 2	Supply and demand I: How markets work	65
Chapter 4	The market forces of supply and demand	66
Chapter 5	Elasticity and its application	95
Chapter 6	Supply, demand and government policies	119
Part 3	Supply and demand II: Markets and welfare	145
Chapter 7	Consumers, producers and the efficiency of markets	146
Chapter 8	Application: The costs of taxation	169
Chapter 9	Application: International trade	191
Part 4	The economics of the public sector	219
Chapter 10	Externalities	220
Chapter 11	Public goods and common resources	243
Chapter 12	The design of the tax system	264
Part 5	Firm behaviour and the organisation of industry	289
Chapter 13	The costs of production	290
Chapter 14	Firms in competitive markets	315
Chapter 15	Monopoly	337
Chapter 16	Monopolistic competition	367
Chapter 17	Oligopoly and business strategy	385
Chapter 18	Competition policy	412
Part 6	The economics of labour markets	433
Chapter 19	The markets for the factors of production	434
Chapter 20	Earnings, unions and discrimination	459
Chapter 21	Income inequity and poverty	486
Part 7	Topics for further study	507
Chapter 22	The theory of consumer choice	508
Chapter 23	Frontiers of microeconomics	537
Glossary		558
Suggestions for reading		563
Index		565

CONTENTS

Preface to this edition	xx
Preface to the original edition	xxiii
To the students	xxiv
About the authors	xxv
Acknowledgements	xxvii
Resources guide	xxviii
Part 1 Introduction	1
Chapter 1 Ten lessons from economics	2
How people make decisions	3
Lesson 1: People face trade-offs	3
Lesson 2: The cost of something is what you give up to get it	4
Lesson 3: Rational people think at the margin	5
Lesson 4: People respond to incentives	7
<i>Case study: Choosing when the stork comes</i>	8
How people interact	9
Lesson 5: Trade can make everyone better off	9
<i>In the news: Outsourcing your own job</i>	10
Lesson 6: Markets are usually a good way to organise economic activity	11
<i>FYI: Adam Smith and the role of markets</i>	12
Lesson 7: Governments can sometimes improve market outcomes	13
How the economy as a whole works	14
Lesson 8: A country's standard of living depends on its ability to produce goods and services	14
Lesson 9: Prices rise when the government prints too much money	15
Lesson 10: Society faces a short-term trade-off between inflation and unemployment	16
Conclusion	17
Summary	18
Key concepts	18
Questions for review	18
Multiple choice	18
Problems and applications	19
Chapter 2 Thinking like an economist	21
The economist as scientist	22
The scientific method: Observation, theory and more observation	22
The role of assumptions	23
Economic models	24
Our first model: The circular-flow diagram	25
Our second model: The production possibilities frontier	26
Microeconomics and macroeconomics	29
The economist as policy adviser	30
Positive versus normative analysis	30
Economists in government	31

Why economists disagree	32
Differences in scientific judgements	32
Differences in values.....	33
What Australian economists think.....	33
<i>What Australian economists think</i>	34
Let's get going	34
Summary	35
Key concepts	35
Questions for review	35
Multiple choice	35
Problems and applications	36
Appendix: Graphing – a brief review	38
Graphs of a single variable	38
Graphs of two variables: The coordinate system.....	38
Curves in the coordinate system	41
Slope and elasticity.....	44
Cause and effect	45
Chapter 3 Interdependence and the gains from trade	49
A parable for the modern economy	50
Production possibilities.....	51
Specialisation and trade.....	52
The principle of comparative advantage	54
Absolute advantage	54
Opportunity cost and comparative advantage.....	54
Comparative advantage and trade.....	55
Applications of comparative advantage	56
Should Roger Federer mow his own lawn?	56
Should a country trade with other countries?	57
<i>In the news: Who has a comparative advantage in slaying ogres?</i>	57
<i>FYI: The legacy of Adam Smith and David Ricardo</i>	58
Conclusion	59
Summary	60
Key concepts	60
Questions for review	60
Multiple choice	60
Problems and applications	61
Part 2 Supply and demand I: How markets work	65
Chapter 4 The market forces of supply and demand	66
Markets and competition	67
What is a market?.....	67
What is competition?.....	67
Demand	68
The demand curve: The relationship between price and quantity demanded.....	68
Market demand versus individual demand	71

<i>FYI: Ceteris paribus</i>	71
Shifts in the demand curve	72
<i>Case study: Are smart phones and tablet computers substitutes or complements?</i>	73
<i>Case study: Two ways to reduce the quantity of smoking demanded</i>	74
Supply	76
The supply curve: The relationship between price and quantity supplied	76
Market supply versus individual supply	77
Shifts in the supply curve	78
Supply and demand together	81
Equilibrium	81
Three steps for analysing changes in equilibrium	83
Conclusion: How prices allocate resources	87
<i>In the news: Mother Nature shifts the supply curve</i>	88
Summary	90
Key concepts	90
Questions for review	90
Multiple choice	91
Problems and applications	92
Chapter 5 Elasticity and its application	95
The elasticity of demand	96
The price elasticity of demand and its determinants	96
Computing the price elasticity of demand	97
The variety of demand curves	98
<i>FYI: The midpoint method: A better way to calculate percentage changes and elasticities</i>	98
Total revenue and the price elasticity of demand	99
<i>Case study: Pricing admission to an art gallery</i>	102
Other demand elasticities	103
<i>FYI: Elasticity and total revenue along a linear demand curve</i>	104
The elasticity of supply	105
The price elasticity of supply and its determinants	105
Computing the price elasticity of supply	106
The variety of supply curves	106
Three applications of supply, demand and elasticity	108
Can good news for farming be bad news for farmers?	109
Why did OPEC fail to keep the price of oil high?	110
Do drug bans increase or decrease drug-related crime?	112
Conclusion	114
Summary	115
Key concepts	115
Questions for review	115
Multiple choice	116
Problems and applications	116

Chapter 6	Supply, demand and government policies	119
Controls on prices		120
How price ceilings affect market outcomes		120
<i>Case study: Lines at the petrol station</i>		122
<i>Case study: Rent control in the short run and long run</i>		123
<i>In the news: Rent control in Mumbai, India</i>		125
How price floors affect market outcomes		126
<i>Case study: Minimum wage rates</i>		127
<i>What Australian economists think</i>		129
Evaluating price controls.....		130
Taxes		130
How taxes on buyers affect market outcomes		131
How taxes on sellers affect market outcomes		133
<i>Case study: Who pays the payroll tax?</i>		134
Elasticity and tax incidence		135
Subsidies		137
How subsidies affect market outcomes		137
<i>Case study: Who gets the benefits from the First Home Owner Grant scheme?</i>		139
<i>What Australian economists think</i>		140
Conclusion		140
Summary		141
Key concepts		141
Questions for review		141
Multiple choice		141
Problems and applications		142
Part 3	Supply and demand II: Markets and welfare	145
Chapter 7	Consumers, producers and the efficiency of markets	146
Consumer surplus		147
Willingness to pay		147
Using the demand curve to measure consumer surplus		148
How a lower price raises consumer surplus		150
What does consumer surplus measure?.....		150
Producer surplus		153
Cost and the willingness to sell		153
Using the supply curve to measure producer surplus		154
How a higher price raises producer surplus.....		156
Market efficiency		157
The benevolent social planner.....		157
Evaluating the market equilibrium		159
<i>Case study: Should there be a market in organs?</i>		161
Conclusion: Market efficiency and market failure		162
<i>In the news: Ticket scalping</i>		163
Summary		165
Key concepts		165

Questions for review	165
Multiple choice	165
Problems and applications	166
Chapter 8 Application: The costs of taxation	169
The deadweight loss of taxation	170
How a tax affects market participants	170
Deadweight losses and the gains from trade	174
The determinants of the deadweight loss	175
<i>Case study: The deadweight loss debate</i>	177
Deadweight loss and tax revenue as taxes vary	178
<i>Case study: The Laffer curve and supply-side economics</i>	178
Conclusion	181
Summary	182
Key concept	182
Questions for review	182
Multiple choice	182
Problems and applications	183
Appendix	186
The welfare economics of subsidies	186
The cost of a subsidy	187
The deadweight loss from a subsidy	188
Understanding the deadweight loss from over production	189
Chapter 9 Application: International trade	191
The determinants of trade	192
The equilibrium without trade	192
The world price and comparative advantage	193
The winners and losers from trade	194
<i>FYI: Comparing prices and comparative advantages</i>	194
The gains and losses of an exporting country	195
The gains and losses of an importing country	197
The effects of a tariff	200
The effects of an import quota	201
The lessons for trade policy	204
<i>FYI: Other benefits of international trade</i>	205
The arguments for restricting trade	205
The jobs argument	206
The national security argument	206
<i>In the news: Should the winners from free trade compensate the losers?</i>	207
The infant industry argument	208
The unfair competition argument	208
The protection-as-a-bargaining-chip argument	209
<i>Case study: Trade agreements and the World Trade Organization</i>	209
<i>In the news: Threats to free trade</i>	210

Conclusion	211
<i>What Australian economists think</i>	212
Summary	214
Key concepts	214
Questions for review	214
Multiple choice	214
Problems and applications	215
Part 4 The economics of the public sector	219
Chapter 10 Externalities	220
Externalities and market inefficiency	222
Welfare economics: A recap.....	222
Negative externalities in production.....	222
Positive externalities in production.....	224
<i>Case study: The debate about technology policy</i>	225
Externalities in consumption.....	226
Private solutions to externalities	227
The types of private solutions.....	227
The Coase theorem.....	228
Why private solutions do not always work.....	229
Public policies on externalities	230
<i>What Australian economists think</i>	230
Command-and-control policies: Regulation.....	231
Market-based policy 1: Corrective taxes and subsidies.....	231
<i>Case study: Taking out the garbage</i>	232
Market-based policy 2: Tradeable pollution permits.....	233
<i>Case study: British Columbia adopts a broad-based carbon tax</i>	235
<i>What Australian economists think</i>	236
Objections to the economic analysis of pollution.....	236
Conclusion	237
<i>In the news: Children as externalities</i>	237
Summary	239
Key concepts	239
Questions for review	239
Multiple choice	239
Problems and applications	240
Chapter 11 Public goods and common resources	243
The different kinds of goods	244
Public goods	246
The free-rider problem.....	246
Some important public goods.....	247
<i>Case study: Are lighthouses public goods?</i>	248
The difficult job of cost-benefit analysis.....	249
<i>Case study: How much is a life worth?</i>	250

Private provision of public goods.....	251
<i>Case study: Is music a public good?</i>	252
Common resources	253
The Tragedy of the Commons.....	253
Some important common resources	254
<i>In the news: The case for toll roads</i>	255
<i>What Australian economists think</i>	257
<i>Case study: Why the cow is not extinct</i>	258
Conclusion: The importance of property rights	259
Summary	260
Key concepts	260
Questions for review	260
Multiple choice	260
Problems and applications	261
Chapter 12 The design of the tax system	264
A financial overview of Australian government	265
The federal government	266
State and local governments	270
Taxes and efficiency	271
Deadweight losses	271
<i>Case study: The goods and services tax</i>	272
Administrative burden.....	274
Marginal tax rates versus average tax rates.....	274
<i>FYI: Tax avoidance and tax evasion</i>	275
<i>Case study: Marginal tax rates and the poverty trap</i>	275
Lump-sum taxes.....	276
Taxes and equity	277
The benefits principle.....	277
The ability-to-pay principle.....	278
<i>Case study: How the burden of taxes is distributed</i>	279
<i>Case study: Who should pay for higher education?</i>	280
Tax incidence and tax equity.....	281
<i>In the news: The HECS experience</i>	281
<i>Case study: Who pays company income tax?</i>	283
Conclusion: The trade-off between equity and efficiency	284
Summary	285
Key concepts	285
Questions for review	285
Multiple choice	285
Problems and applications	286
Part 5 Firm behaviour and the organisation of industry	289
Chapter 13 The costs of production	290
What are costs?	291
Total revenue, total cost and profit.....	291

Costs as opportunity costs.....	292
The cost of capital as an opportunity cost.....	292
Economic profit versus accounting profit.....	293
Production and costs	294
<i>FYI: How long is the long run?</i>	294
The production function.....	295
From the production function to the total-cost curve.....	297
The various measures of cost	298
Fixed and variable costs.....	299
Average and marginal cost.....	300
Cost curves and their shapes.....	301
Typical cost curves.....	303
Costs in the short run and in the long run	303
The relationship between short-run and long-run average total cost.....	304
Economies and diseconomies of scale.....	305
Conclusion	306
<i>FYI: Lessons from a pin factory</i>	307
Summary	309
Key concepts	309
Questions for review	309
Multiple choice	310
Problems and applications	310
Chapter 14 Firms in competitive markets	315
What is a competitive market?	316
The meaning of competition.....	316
The revenue of a competitive firm.....	317
Profit maximisation and the competitive firm's supply curve	318
A simple example of profit maximisation.....	318
The marginal-cost curve and the firm's supply decision.....	320
The firm's short-run decision to shut down.....	322
<i>Case study: Near-empty restaurants and off-season ski lodges</i>	323
<i>FYI: Spilt milk and sunk costs</i>	324
The firm's long-run decision to exit or enter a market.....	324
Measuring profit in our graph for the competitive firm.....	325
The supply curve in a competitive market	327
The short run: Market supply with a fixed number of firms.....	327
The long run: Market supply with entry and exit.....	327
A shift in demand in the short run and long run.....	329
<i>FYI: Why do competitive firms stay in business if they make zero profit?</i>	331
Why the long-run supply curve might slope upwards.....	331
Conclusion: Behind the supply curve	332
Summary	333
Key concepts	333
Questions for review	333

Multiple choice	333
Problems and applications	334
Chapter 15 Monopoly	337
Why monopolies arise	339
Monopoly resources	339
<i>Case study: The gas industry in south-eastern Australia</i>	339
Government-created monopolies	340
Natural monopolies	341
How monopolies make production and pricing decisions	342
Monopoly versus competition	342
A monopoly's revenue	343
Profit maximisation	345
<i>FYI: Why a monopoly does not have a supply curve</i>	347
A monopoly's profit	348
<i>Case study: Bell's monopoly and the price of telephone calls</i>	348
The welfare cost of monopoly	350
The deadweight loss	350
The monopoly's profit: A social cost?	352
<i>FYI: Measuring the cost of monopoly</i>	353
Price discrimination	353
A parable about pricing	354
The moral of the story	355
The analytics of price discrimination	355
Examples of price discrimination	356
<i>In the news: Why do Australians pay more for digital downloads?</i>	358
Conclusion: The prevalence of monopoly	360
Summary	362
Key concepts	362
Questions for review	362
Multiple choice	362
Problems and applications	363
Chapter 16 Monopolistic competition	367
Between monopoly and perfect competition	368
Competition with differentiated products	370
The monopolistically competitive firm in the short run	370
The long-run equilibrium	371
Monopolistic versus perfect competition	373
Monopolistic competition and the welfare of society	375
Advertising	376
The debate about advertising	376
<i>Case study: Advertising and the price of glasses</i>	377
Advertising as a signal of quality	378
Brand names	379
Conclusion	380

Summary	382
Key concepts	382
Questions for review	382
Multiple choice	382
Problems and applications	383
Chapter 17 Oligopoly and business strategy	385
Markets with only a few sellers	386
A duopoly example	387
Competition, monopolies and cartels	388
The equilibrium for an oligopoly	388
How the size of an oligopoly affects the market outcome	389
<i>Case study: OPEC and the world oil market</i>	391
Game theory and the economics of cooperation	391
The prisoners' dilemma	392
Oligopolies as a prisoners' dilemma	393
Other examples of the prisoners' dilemma	394
The prisoners' dilemma and the welfare of society	396
Why people sometimes cooperate	397
<i>Case study: The prisoners' dilemma tournament</i>	398
Conclusion	399
Summary	400
Key concepts	400
Questions for review	400
Multiple choice	400
Problems and applications	401
Appendix: Types of oligopolistic competition	405
Anticipating your competitor's response	405
Cournot quantity competition	405
Bertrand price competition	409
Comparing Cournot and Bertrand competition	410
Chapter 18 Competition policy	412
Public policy towards monopolies	413
Using the law to increase competition	414
<i>FYI: What Australian economists think</i>	415
Regulation	416
Public ownership and privatisation	417
Doing nothing	418
<i>Case study: The ACCC – Australia's competition regulator</i>	418
<i>FYI: What Australian economists think</i>	419
Public policy towards oligopolies	421
Restraint of trade and competition laws	421
<i>In the news: How to form a cartel</i>	421
<i>FYI: What Australian economists think</i>	423
Controversies over competition policy	423

<i>In the news: When is the price of milk too low?</i>	424
<i>Case study: The Baxter case</i>	426
Conclusion	427
Summary	429
Key concepts	429
Questions for review	429
Multiple choice	429
Problems and applications	430
Part 6 The economics of labour markets	433
Chapter 19 The markets for the factors of production	434
The demand for labour	436
The competitive profit-maximising firm.....	436
The production function and the marginal product of labour.....	437
The value of the marginal product and the demand for labour.....	438
What causes the labour demand curve to shift?.....	440
<i>FYI: Input demand and output supply – two sides of the coin</i>	440
The supply of labour	441
The trade-off between work and leisure.....	442
What causes the labour supply curve to shift?.....	442
<i>In the news: The economy needs you</i>	443
Equilibrium in the labour market	444
Shifts in labour supply.....	444
Shifts in labour demand.....	445
<i>Case study: Productivity and wages</i>	447
The other factors of production: Land and capital	448
Equilibrium in the markets for land and capital.....	448
<i>FYI: What is capital income?</i>	449
Linkages among the factors of production.....	450
<i>Case study: The economics of the Black Death</i>	450
Conclusion	451
Summary	452
Key concepts	452
Questions for review	452
Multiple choice	452
Problems and applications	453
Appendix: The demand for labour under imperfect competition and monopoly	456
Chapter 20 Earnings, unions and discrimination	459
Some determinants of equilibrium wages	460
Compensating differentials.....	460
Human capital.....	461
<i>Case study: The changing value of skills</i>	462
Ability, effort and chance.....	463
<i>Case study: The benefits of beauty</i>	463
An alternative view of education: Signalling.....	464

The superstar phenomenon	465
Unions and imperfect competition in labour markets	466
Unions as monopolists	467
Bilateral monopoly	469
Are unions good or bad for the economy?	471
The theory of efficiency wages	472
Worker health	472
<i>FYI: Why do strikes occur?</i>	472
Worker turnover	474
Worker effort	474
Worker quality	474
<i>Case study: Henry Ford and the generous \$5-a-day wage</i>	475
The economics of discrimination	476
Measuring labour-market discrimination	476
Discrimination by employers	477
<i>Case study: Segregated streetcars and the profit motive</i>	478
Discrimination by customers and governments	479
<i>Case study: Can asymmetric information explain discrimination?</i>	480
Conclusion	480
Summary	482
Key concepts	482
Questions for review	482
Multiple choice	483
Problems and applications	484
Chapter 21 Income inequity and poverty	486
The measurement of inequality	487
Australian income inequality	487
<i>Case study: The women's movement and income distribution</i>	489
The poverty rate	490
<i>Case study: Income inequality around the world</i>	491
Problems in measuring inequality	492
The political philosophy of redistributing income	494
Utilitarianism	494
Liberalism	496
Libertarianism	497
<i>What Australian economists think</i>	498
Policies to reduce poverty	498
Minimum-wage laws	498
Social security	499
Negative income tax	499
<i>In the news: Thinking innovatively about income redistribution</i>	500
In-kind transfers	501
Anti-poverty programs and work incentives	502
Conclusion	503
Summary	504

Key concepts	504
Questions for review	504
Multiple choice	504
Problems and applications	505
Part 7 Topics for further study	507
Chapter 22 The theory of consumer choice	508
The budget constraint: What the consumer can afford	509
Preferences: What the consumer wants	511
Representing preferences with indifference curves.....	511
Four properties of indifference curves.....	513
Two extreme examples of indifference curves.....	515
Optimisation: What the consumer chooses	516
The consumer's optimum choices.....	516
<i>FYI: Utility – an alternative way to describe preferences and optimisation</i>	516
How changes in income affect a consumer's choices.....	518
How changes in prices affect a consumer's choices.....	519
Income and substitution effects.....	521
Deriving the demand curve.....	523
Three applications	524
Do all demand curves slope downwards?.....	524
How do wages affect labour supply?.....	525
<i>Case study: Income effects on labour supply – historical trends, lottery winners and the Carnegie conjecture</i>	528
<i>What Australian economists think</i>	529
How do interest rates affect household saving?.....	529
Conclusion: Do people really think this way?	532
Summary	533
Key concepts	533
Questions for review	533
Multiple choice	534
Problems and applications	535
Chapter 23 Frontiers of microeconomics	537
Asymmetric information	538
Hidden actions: Principals, agents and moral hazard.....	538
<i>FYI: Corporate management</i>	539
Hidden characteristics: Adverse selection and the lemons problem.....	540
Signalling to convey private information.....	541
<i>Case study: Gifts as signals</i>	542
Screening to induce information revelation.....	543
Asymmetric information and public policy.....	543
Political economy	544
The Condorcet voting paradox.....	544
Arrow's impossibility theorem.....	545
The median voter is king.....	546

Politicians are people too	548
Behavioural economics	548
People aren't always rational	548
<i>Case study: Left-digit bias</i>	550
People care about fairness	551
People are inconsistent over time	551
<i>What Australian economists think</i>	552
Conclusion	553
Summary	554
Key concepts	554
Questions for review	554
Multiple choice	554
Problems and applications	555
Glossary	558
Suggestions for reading	563
Index	565

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 lessons from 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 Lessons from Economics in chapter 1 to remind students that these lessons 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, unions 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 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
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ABOUT THE AUTHORS

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 Professor of Economics at Monash University and a Member of the Economic Regulation Authority of Western Australia. Prior to joining Monash, Stephen was 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 introductory courses at Harvard University and the University of Melbourne.

Professor King specialises in industrial economics, although his research has covered a wide range of areas, including game theory, corporate finance, privatisation and tax policy. His work has been published in academic journals such as the *Journal of Industrial Economics*, *European Economic Review* and *Journal of Political Economy*. Stephen regularly provides advice to both government and private firms 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 run away from home to study at University.

Martin Byford is 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's introductory microeconomics course is currently taught on RMIT campuses in Australia, Singapore and Vietnam.

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 Economics and Management Strategy*, and *Economic Papers*. 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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RESOURCES GUIDE

FOR THE STUDENT

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



Where you see this symbol, you should refer to the **Ten lessons from economics** found in chapter 1 of this text.

Learning objectives are listed at the start of each chapter giving you a clear sense of what the chapter will cover.

The **Introduction** is a short story, focused on the chapter topic, about how microeconomics affects you on a daily basis without you even noticing.



imports
goods and services that are produced abroad and sold domestically

When **key terms** are used in the text for the first time, they are bolded, coloured and defined in the margins. This will help you identify key concepts throughout the text.

IN THE NEWS

MOTHER NATURE SHIFTS THE SUPPLY CURVE

In this chapter we have seen three examples of how to use supply and demand curves to analyse a change in equilibrium. Whenever an event shifts the supply curve, the demand curve, or perhaps both curves, you can use these tools to predict how the event will alter the price and quantity sold in equilibrium. This article provides another example of how a natural disaster that reduces supply reduces the quantity sold and raises the price.

Bananas to recover quickly
by Tony Koch

Banana prices, which have risen because of crop devastation caused by Cyclone Yasi, will not stay high for long because of lessons learned by progressive farmers when Cyclone Larry caused similar havoc in 2006.

The advance notice of Yasi to growers in the Tully and Innisfail areas allowed a frenzied few days of picking mature fruit and storing it in packing sheds, ensuring at least two weeks' supply.

As well, farmers deleafed young trees, leaving just the stems standing, and these were not knocked over by the cyclonic winds as were the mature trees.

Australian banana production is 286 000 tonnes a year, or about 25 million cartons, each with 13 kg of fruit.

Gross value of the produce is \$500 million based on an average wholesale price of \$20 a carton.

The industry is estimated to be worth more than \$870m to the broader economy through the employment it provides and ancillary services. North Queensland has 12 000ha of plantations, producing about 85 per cent of Australia's crop.

More than 3000 people are employed directly in the banana industry in the cyclone-affected areas.

The Australian Banana Growers Council reported last week that 95 per cent of the crop in Tully and Innisfail was lost, or about 10 200ha, as well as 10 per cent on the Atherton Tableland (1350ha) and 100 per cent at Cardwell (630ha). Council chief executive Jonathan Eccles said about 5 per cent of crops in the Innisfail-Tully area had been deleafed, which will mean those crops can be harvested four months or so earlier than crops that must be planted now.

'Banana supply from Innisfail and Tully will not be back to normal for at least six months, with full supply not expected before December 2011,' he said.

'As well as the deleafing helping some get back into production quicker, Cyclone Yasi affected crops differently from the way Larry did.

'This time the stems were broken off higher up, about a metre and a half, and that stem is being left to provide nourishment for the adjoining sucker.

'The third thing working for farmers is that Yasi has come at the end of January and Larry hit towards the end of March, so there is a

Current economic news and events are presented as **In the news**. This selection of media and journal clippings will explore how microeconomic ideas shed light on current affairs.

FYI

Elasticity and total revenue along a linear demand curve

Although some demand curves have an elasticity that is the same along the entire curve, that is not always the case. An example of a demand curve along which elasticity changes is a straight line, as shown in Figure 5.5. A linear demand curve has a constant slope. Recall that slope is defined as 'rise over run', which here is the ratio of the change in price ('rise') to the change in quantity ('run'). In this case, the demand curve's slope is constant because each \$1 increase in price causes the same 2-unit decrease in the quantity demanded.

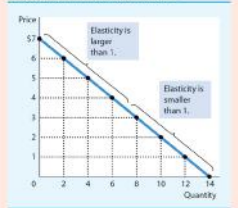
Even though the slope of a linear demand curve is constant, the elasticity is not. The reason is that the slope is the ratio of changes in the two variables, whereas the elasticity is the ratio of percentage changes in the two variables. You can see this most easily by

looking at Table 5.1. This table shows the demand schedule for the linear demand curve in Figure 5.5 and calculates the price elasticity of demand using the midpoint method discussed earlier. At points with low price and high quantity, the demand curve is inelastic. At points with a high price and low quantity, the demand curve is elastic. The explanation for this fact comes from the arithmetic of percentage changes. When the price is low and consumers are buying a lot, a \$1 price increase and 2-unit reduction in quantity demanded constitutes a large percentage increase in the price and a small percentage decrease in quantity demanded, resulting in a small elasticity. By contrast, when the price is high and consumers are not buying much, the same \$1 price increase and 2-unit reduction in quantity demanded constitutes a small percentage increase in the price and a large percentage decrease in quantity demanded, resulting in a large elasticity.

Table 5.1 also presents total revenue at each point on the demand curve. These numbers illustrate the relationship between total revenue and elasticity. When the price is \$1, for instance, demand is inelastic and a price increase to \$2 raises total revenue. When the price is \$5, demand is elastic and a price increase to \$6 reduces total revenue. Between \$3 and \$4, demand is exactly unit elastic and total revenue is the same at these two prices.

The linear demand curve illustrates that the price elasticity of demand need not be the same at all points on a demand curve. A constant elasticity is one possibility, but it is not, always the case.

Figure 5.5 A linear demand curve



The slope of a linear demand curve is constant, but its elasticity is not.

QUIZ

List the determinants of the demand for pizza. Give an example of a demand schedule for pizza, and graph the implied demand curve. Give an example of something that would shift this demand curve. Would a change in the price of pizza shift this demand curve?

Throughout the chapter there are quick **quizzes** to assess your knowledge and comprehension of key topics.

What Australian economists think

There are a number of government policies that are generally opposed by economists. For example 65.2 per cent of economists would like to see an end to the stamp duty on home sales (stamp duties are state taxes payable when you buy or sell an asset), while 19.2 per cent of respondents disagree.

As experts, the role of economists in public policy formation is to analyse proposals and inform public debate. Of the economists

surveyed 84.9 per cent agree with the statement: 'Prior to approval of any major public infrastructure project, an independent and expert cost-benefit study should be conducted and released publicly.' Only 8.5 per cent of respondents disagree.

Source: ESA Policy Opinion Survey of Australian Economists 2011, <http://esacentral.org.au/publications/useful-links/2011-policy-opinion-survey>

What Australian economists think

highlights recent policy issues using data from Economics Society of Australia.

CASE STUDY

Two ways to reduce the quantity of smoking demanded

Public policymakers often want to reduce the amount that people smoke because of smoking's adverse health effects. There are two ways that policy can attempt to achieve this goal.

One way to reduce smoking is to shift the demand curve for cigarettes and other tobacco products. Public service announcements, the mandatory health warnings on cigarette packs and the prohibition of cigarette advertising are all policies aimed at reducing the quantity of cigarettes demanded at any given price. If successful, these policies shift the demand curve for cigarettes to the left, as in panel (a) of figure 4.4.

Alternatively, policymakers can try to raise the price of cigarettes: if the government taxes the manufacture of cigarettes, for example,

cigarette companies pass much of this tax on to consumers in the form of higher prices. A higher price encourages smokers to reduce the amount of cigarettes they smoke. In this case, the reduced amount of smoking does not represent a shift in the demand curve. Instead, it represents a movement along the same demand curve to a point with a higher price and lower quantity, as in panel (b) of figure 4.4.

How much does the amount of smoking respond to changes in the price of cigarettes? Economists have attempted to answer this question by studying what happens when the tax on cigarettes changes. They have found that a 10 per cent increase in the price causes a 4 per cent reduction in the quantity demanded. Teenagers are found to be especially sensitive

Case studies throughout the book will help you conceptualise key issues in the text, demonstrating how your knowledge can be applied to real-world situations.

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.

At the end of each chapter there are several learning tools that will help you review the chapter and key concepts.

Part 2 Supply and demand 1 How markets work

The supply of housing is, in general, inelastic. There is a fixed supply of available land and the number of dwellings that can be constructed on a given property is limited by planning regulations. In contrast, first home buyers are likely to be price sensitive (in other words demand is elastic). They typically have limited assets, and often have viable alternatives to buying a home, including renting, living with parents or share housing. Demand and supply curves for the housing market are illustrated in figure 6.11.

The effect of the subsidy is to create a wedge between the price paid by buyers and received by sellers. To be precise, the price paid by buyers, once the subsidy is taken into account, is \$7000 less than the price received

by sellers. As in the case of taxes, it does not matter which party directly receives the payment from the government, only the size of the wedge is important.

Figure 6.11 illustrates the way in which the benefit of the subsidy are divided between the buyer and seller of houses. Because demand is relatively elastic, the price paid by buyers does not fall by much. In contrast, the inelastic supply of sellers results in them receiving the vast majority of the benefits. What are the implications of this analysis for the housing market?

Essentially, the First Home Owner Grant scheme has done little to improve the affordability of housing. The true beneficiaries of the subsidy are not first home buyers, but rather people who already own property.

WHAT AUSTRALIANS THINK

The flaws of the First Home Owner Grant scheme have been well understood by economists for some time. In the 2011 Economics Society of Australia survey of economists 72.9 per cent of respondents supported abolishing the scheme (14.4 per cent disagreed). Despite this, the First Home Owner Grant scheme remains in place in every Australian state and territory.

Chapter 6 Supply, demand and government policies

2 Summary

- A price ceiling is a legal maximum on the price of a good or service. An example is rent control. If the price ceiling is below the equilibrium price, so the price ceiling is binding, the quantity demanded exceeds the quantity supplied. Because of the resulting shortage, sellers must in some way ration the good or service among buyers.
- A price floor is a legal minimum on the price of a good or service. An example is a minimum or award wage. If the price floor is above the equilibrium price, so the price floor is binding, the quantity supplied exceeds the quantity demanded. Because of the resulting surplus, buyers' demands for the good or service must in some way be rationed among sellers.
- When the government levies a tax on a good, the equilibrium quantity of the good falls. That is, a tax on a market shrinks the size of the market.
- A tax on a good places a wedge between the price paid by buyers and the price received by sellers. When the market moves to the new equilibrium, buyers pay more for the good and sellers receive less for the good. In this sense, buyers and sellers share the tax burden. The incidence of a tax (that is, the division of the tax burden) does not depend on whether the tax is levied on buyers or sellers.
- The incidence of a tax depends on the price elasticities of supply and demand. Most of the burden falls on the side of the market that is less elastic because that side of the market cannot respond as easily to the tax by changing the quantity bought or sold.
- When the government places a subsidy on a good, the equilibrium quantity of the good rises. That is, a subsidy for a market expands the size of the market.

3 Key concepts

search, p. 127 price floor, p. 120 tax incidence, p. 131
price ceiling, p. 120 subsidy, p. 137

4 Questions for review

- Give an example of a price ceiling and of a price floor.
- Which causes a shortage of a good – a price ceiling or a price floor? Which causes a surplus?
- What mechanisms allocate resources when the price of a good is not allowed to bring supply and demand into equilibrium?
- Explain why economists usually oppose controls on prices.
- What is the difference between a tax paid by buyers and a tax paid by sellers?
- How does a tax on a good affect the price paid by buyers, the price received by sellers and the quantity sold?
- What determines how the burden of a tax is divided between buyers and sellers? Explain your answer.
- Explain why a subsidy can be thought of as a negative tax. How do the insights developed in our analysis of taxes extend to subsidies?

5 Multiple choice

- When the government imposes a binding price floor, it causes
 - a. the supply curve to shift to the left.
 - b. the demand curve to shift to the right.
 - c. a shortage of the good to develop.
 - d. a surplus of the good to develop.

1 CONCLUSION

The economy is governed by two kinds of laws – the laws of supply and demand and the laws enacted by governments. In this chapter we have begun to see how these laws interact. Price controls, taxes and subsidies are common in various markets in the economy and their effects are frequently debated in the press and among policymakers. Even a little bit of economic knowledge can go a long way towards understanding and evaluating these policies.

In subsequent chapters we will analyse many government policies in greater detail. We examine the effects of taxation more fully and consider a broader range of policies than we considered here. Yet the basic lessons of this chapter will not change – when analysing government policies, supply and demand are the first and most useful tools of analysis.

140

1 The **Conclusion** puts the content into perspective.

2 The end of chapter **Summary** provides you with key bullet points from the chapter.

3 All **Key concepts** referred to in the chapter are listed and page-referenced to guide your revision.

4 **Questions for review** ensure you have a complete understanding of the chapter's key concepts.

5 **Multiple choice questions** consolidate key ideas from the chapter.

Part 2 Supply and demand 1 How markets work

6 Problems and applications

- Lovers of classical music persuade the government to impose a price ceiling of \$20 per concert ticket. As a result of this policy, do more or fewer people attend classical music concerts?
- The government has decided that the free-market price of milk is too low.
 - a. Suppose the government imposes a binding price floor in the milk market. Use a supply- and-demand diagram to show the effect of this policy on the price of milk and the quantity of milk sold. Is there a shortage or surplus of milk?
 - b. Farmers complain that the price floor has reduced their total revenue. Is this possible? Explain.
 - c. In response to farmers' complaints, the government agrees to purchase all of the surplus milk at the price floor. Compared with the basic price floor, who benefits from this new policy? Who loses?
- A recent study found that the demand and supply schedules for hibiscus are as follows:

Price per hibiscus	Quantity demanded	Quantity supplied
\$11	1 million	15 million
10	2	12

a. zero payments on a loan increases the government's debt.
d. the amount of a tax levied on suppliers.

6 **Problems and applications** enable you to apply the theory you have learned and encourage group discussion.

Online resources

Visit <http://login.cengage.brain.com> and login using the code card at the front of this book for access to the *Principles of Microeconomics CourseMate Website*. You will find an ebook, quizzing, flashcards, crosswords, graphing workshops, videos and more tools to help you excel in your studies.



From <http://login.cengage.brain.com> you can also access *Search me! economics*. Fast and convenient, this resource provides you with 24-hour access to full-text articles from hundreds of scholarly and popular journals, ebooks and newspapers, including *The Australian* and *The New York Times*. Use the *Search me! economics* key words provided in the margins of each chapter to explore topics further and find current references. These terms will get you started – then try your own search terms to expand your knowledge.

FOR THE INSTRUCTOR

Cengage Learning is pleased to provide you with an extensive selection of resources that have been developed to supplement the sixth edition of *Principles of Microeconomics*. These resources are available on the instructor's companion website accessible via <http://login.cengage.com>

Instructor's manual

The *Instructor's manual* provides you with a wealth of content to help set up and administer an introductory microeconomics course. It includes learning objectives, chapter outlines, key points, figures from the texts, adjunct teaching and warm-up activities as well as solutions to problems in the text.

PowerPoint presentations

Chapter-by-chapter *PowerPoint presentations* cover the main concepts addressed within the text and can be edited to suit your own requirements. Use these slides to enhance your lecture presentations and to reinforce the key principles of your subject, or for students handouts.

ExamView test bank

ExamView helps you to create, customise and deliver tests in minutes for both print and online applications. The Quick Test Wizard and Online Test Wizard guide you step-by-step through the test creation process. With ExamView's complete word processing abilities, you can add an unlimited number of new questions to the bank, edit existing questions and build tests of up to 250 questions using 12 different question types. You can also export the files into Blackboard or WebCT.

Artwork

These digital files of graphs and figures from the book can be used in a variety of media. Add them into your course management system, use them with student handouts or copy them into lecture presentations.

part 1

Introduction

Chapter 1 Ten lessons from economics

Chapter 2 Thinking like an economist

Chapter 3 Interdependence and the gains from trade

1

Ten lessons from 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 for ‘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 Porsche 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 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 Lessons from 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 lessons 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 lessons about individual decision making.

Lesson 1: People face trade-offs

You may have heard the saying: ‘There is 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 TV or working at her part-time job for some extra spending money.

Or 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.

Lesson 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

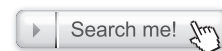
Consider, for example, the decision whether to go to university. The benefits include intellectual enrichment and a lifetime of better job opportunities. But what is the cost? To answer this question, you might be tempted to add up the money you or your parents spend on fees, books, rent and food. Yet 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 are more expensive because you are going to university. For instance, you might have to move cities to attend university and live away from home. Indeed, the cost of your room and food at your residential college or home might be less than the rent and food expenses that you would pay living on your own. In this case, the savings on the room and food are a benefit of going to university.

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



opportunity cost

Lesson 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 watching TV. 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*.

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 \$7. Your mobile phone plan costs you \$40 per month plus \$0.50 per minute for whatever calls you make. You usually talk for 100 minutes a month, so your total monthly bill is \$90 (\$0.50 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 \$90 for 100 minutes of calling each month,

marginal change
a small incremental adjustment to a plan of action

the average minute on the phone costs me \$0.90. So a 10-minute call costs \$9. Because that \$9 cost is greater than the \$7 benefit, I am going to skip the call.’ That conclusion is wrong, however. Although the average cost of a 10-minute call is \$9, the marginal cost—the amount your bill increases if you make the extra call—is only \$5. You will make the right decision only by comparing the marginal benefit and the marginal cost. Because the marginal benefit of \$7 is greater than the marginal cost of \$5, 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 make long and frivolous calls.



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; but for some reason, 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.

Lesson 4: People respond to incentives

An incentive is something (such as 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 crucial 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 for 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 behaviour might change as a result, their policies can have effects that they did not intend. For example, consider public policy toward 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, wearing a seat belt reduces the benefits of slow and careful driving. People respond to wearing seat belts as they would to an improvement in road conditions – by driving faster and less carefully. The result of a seat belt law, therefore, is a larger number of accidents. The decline in safe driving has a clear, adverse impact on pedestrians who are more likely to find themselves in an accident but, unlike the drivers, are not protected by a seat belt. Thus, a seat belt law tends to increase the number of pedestrian deaths.

At first, this discussion of incentives and seat belts might seem like idle speculation. Yet in a classic 1975 study, economist Sam Peltzman argued that car safety laws in the United States have, in fact, had many of these effects. According to Peltzman's evidence, US laws produced both fewer deaths per accident and more accidents. He concluded that the net result was little change in the number of driver deaths and an increase in the number of pedestrian deaths.

Peltzman's analysis of car safety is an offbeat and controversial example of the general principle that people respond to incentives. It implies that more recent changes to car safety laws, such as requiring air bags and advanced braking systems in new cars, may mean more deaths for pedestrians and cyclists. When analysing any policy, we must consider not only the direct effects but also the less obvious, indirect effects that work through incentives. If the policy changes incentives, it will cause people to alter their behaviour.

QUIZ

List and briefly explain the four lessons of individual decision making. Describe an important trade-off you recently faced. Describe an incentive your parents offered you in an effort to influence your behaviour.

CASE STUDY

Choosing when the stork comes

In the decade between 2004 and 2014, the Australian government made a payment to parents for every baby born. These payments were known as the 'baby bonus', and ranged in value between \$3000 and \$5437 across the lifetime of the scheme. The story of the baby bonus has lessons for how people respond to incentives and why governments (and others) need to anticipate these responses.

In May 2004, the then Treasurer, Peter Costello, announced a \$3000 payment (rising to

\$5000 in 2008) for every child born after 1 July 2004. This meant that the parents of someone whose birthday was 30 June 2004 or earlier would receive nothing. But hold off a day or so, and they would get \$3000. This created an incentive for parents to delay births if they could. And by agreeing with their doctors to schedule planned caesareans and inducements a little later, births could be moved.

The following graph shows what happened.

