

Brief contents

<i>List of figures</i>		xv
<i>List of tables</i>		xxi
<i>List of essential maths</i>		xxii
<i>About the author</i>		xxiv
<i>Acknowledgements</i>		xxv
<i>Message to students</i>		xxvii
<i>Message to lecturers</i>		xxxiii
PART I	MARKETS IN CONTEXT	1
Chapter 1	Key principles	3
Chapter 2	Perfect markets	14
PART II	RESOURCE ALLOCATION FOR PEOPLE	35
Chapter 3	The budget set	37
Chapter 4	Preferences	56
Chapter 5	Utility functions	76
Chapter 6	The most-preferred, affordable bundle	95
Chapter 7	Demand functions	118
Chapter 8	Price changes	139
Chapter 9	The CES utility function	158
PART III	RESOURCE ALLOCATION FOR FIRMS	179
Chapter 10	Production	181
Chapter 11	Cost functions	200
Chapter 12	Costs and planning	220
Chapter 13	Firm supply in perfect competition	233
Chapter 14	Equilibrium in perfect competition	249
PART IV	MARKET POWER	263
Chapter 15	Monopoly	265
Chapter 16	Price discrimination	285
Chapter 17	Oligopoly	303

Chapter 18	Game theory: concepts	322
Chapter 19	Game theory: applications	343
PART V	WELFARE	367
Chapter 20	Exchange	369
Chapter 21	Production and distribution	393
Chapter 22	Externalities	413
Chapter 23	Public goods	431
PART VI	BEHAVIOUR	449
Chapter 24	Personal choice	451
Chapter 25	Inter-temporal choice	474
Chapter 26	Choice and risk	498
Chapter 27	Rationality and behaviour	519
PART VII	APPLYING GAME THEORY	545
Chapter 28	Games with incomplete information	547
Chapter 29	Product differentiation	568
Chapter 30	Auctions	590
Chapter 31	Afterword	610
	<i>Glossary</i>	615
	<i>Bibliography</i>	621
	<i>Index</i>	625

Key principles

What we do in this chapter

Throughout this book, we will treat *economics* as the study of how people allocate resources. In this chapter, we start off by thinking what that might mean – how we use our time, and how we might start to develop useful arguments. As soon as possible, we introduce a very important rule to which we shall return repeatedly: the *equi-marginal principle*. This is a condition that must hold when people have solved their resource allocation problem, applying their resources to their most productive uses.

Resource allocation frequently takes place within *markets*, with buyers and sellers exchanging goods and services for money. We outline principles for the economic analysis of a market, defining the concept of *market clearing*, which occurs when the quantity that sellers offer equals the amount that buyers demand. To illustrate how markets might operate, we conclude the chapter with examples of the variety of *market structures* in which goods and services can be traded, using examples that will often be familiar from everyday life.

1.1 The value of microeconomics

Why are you reading this? Only a few people open up a textbook and start reading it from the beginning. Perhaps you are engaged in displacement activity just now, on an evening when you are trying to avoid completing an assignment. Or maybe you are panicking on the night before you sit an exam, having persuaded yourself that you know nothing about economics, and so have at last opened the book that you bought in the first week of the course. Or maybe you are simply curious to read this introductory material as it precedes sections that you have been assigned as reading. Whichever of these it might be, the important point is that *you have made a choice* to read this paragraph. And we shall argue throughout this book that wherever people choose one action from all those which are available to them, then this choice is potentially a subject for microeconomic analysis.

I begin with a bold claim, which I will not justify: that among the social sciences, economics is unique in its conviction that *human behaviour is always purposeful*. In thinking about why you choose to read this paragraph, we may assume that you have chosen freely. Economics claims that your chosen action stems from a belief that there is no better way to spend your time at this precise moment than to read these exact words. Perhaps in five minutes' time, something will have changed – a friend might have phoned and you might have put the book down once again to talk or to go out to meet him or her. But just for now, reading this introduction is what you have decided to do.

We should perhaps add that reading this book is the best thing that you can do in the context of being required to complete a course in microeconomic theory. Your decision to study economics is here a part of the environment that shapes the payoffs to your actions. Given the book's content and format, it is likely to make considerable intellectual demands on

you – enough, certainly, to deter all but the most determined amateur. Without the prospect of an examination in the subject, almost everyone would consider the *cost* of reading this book to exceed the *benefits* from doing so. Only economics students, specifically those who have been told that they must read this book, act *rationally* in reading it, in the sense that it is only they who can identify potential benefits that are greater than the costs. We can generalize from this simple observation: *people choose actions that maximize benefits (net of costs)*.

This is not a complete explanation of your choice to read this page. Not every student's interest in economics is purely instrumental, beginning and ending with its value as a source of academic credit. I have had countless discussions with students about how to use economic principles to understand a wide variety of social phenomena. Although it is thirty years since I first picked up an economics textbook, I can still remember the argument in it – about the nature of sunk costs – that first caught my attention. Consider this example.

Suppose that a firm bought a machine tool for £750,000 last year, but that a new method of production has now been developed, so that the machine has no resale value and new machines can produce the same output more cheaply. The purchase price is then a sunk cost in the sense that it cannot be recovered. It should play no part in the firm's decisions about how to use the machine. It would be wrong for the firm to argue thus: since the money was spent recently, we should not mothball or scrap the machine, but instead recover the investment costs by using it to make and sell output. Such an argument would fail to take into account that, looking to the future, the firm should write off its investment as soon as the purchase and use of new machinery would increase profits. The concept of sunk costs leads us to the conclusion that in economics, what has been done cannot be undone: bygones are bygones.

When I first read this argument, it immediately seemed entirely obvious to me, yet before that moment it had never occurred to me – or at the very least, it had never occurred to me in the way that it was then presented. It seemed at once quite mundane and yet entirely novel that when we make a decision we should always look to the future, to what our actions might change, rather than to the past, so that our actions justify past decisions. That was the meaning of the conclusion, 'Let bygones be bygones.' I still remember that moment because it demonstrated exactly what a good economic argument does, transforming the way that we think about particular problems.

Coming back to why you are reading these pages, let me suggest one reason for writing this book. I want to present an introduction to microeconomic theory in such a way that, for at least a few readers, it will be the start of a lifetime of engagement with microeconomics and the economic way of looking at the world; and that somewhere in this textbook there will be arguments memorable enough to capture their attention and imagination. I hope that you might find this happening as you read these pages; and, even if you don't, that you will at least find the material you require to enable you to approach your exams feeling confident that you will pass them.

1.1.1 Microeconomics and resource allocation

Assuming that behaviour is purposeful, we shall explore economics as a way of thinking about the behaviour of people, businesses, and organizations. We do not seek to define what those purposes are, or indeed what they should be: those are more typically concerns

of psychology or moral philosophy. Nor are economists, unlike sociologists or political scientists, typically interested in the social factors that might affect choice. Instead, economists tend to assume quite general objectives – perhaps that people wish to be as happy as possible, or that firms wish to maximize profits. They then consider the resources that people or firms might possess and use to enable them to achieve those objectives. Lastly, they investigate how those resources should best be used.

We might say that microeconomics is the study of choice. You have chosen to read this book, which is a choice in the sense that we use the term in microeconomics. But it may be more fruitful to define microeconomics as the study of resource allocation. You have only a finite amount of time available in a day or a week, or even a year. There are many ways in which you can spend, or allocate, that time, of which reading this book is only one. According to the theory of resource allocation that we shall develop, every chosen resource allocation should be economically *efficient*, in the sense that there should be no alternative that might enable people to achieve their objectives more fully.

1.1.2 The equi-marginal principle

We shall assume that there is some measure of both benefits and costs associated with every action or activity that we might choose or engage in. We shall assume that both benefits and costs can be measured on a single scale, such as monetary or time values. We shall also assume that activities are variable in intensity, so that it is possible to alter their level very slightly. For example, suppose that there are only two activities open to you just now: surfing the Web or reading this book. You can choose to vary the amount of time that you spend on each by a few seconds. We refer to these small changes in the level of an activity, increasing or reducing it by a few seconds, as being **changes at the margin**. Generally, in microeconomic analysis, we are interested in changes in both benefits and costs at the margin. For the moment, though, let us say that we are only interested in the marginal benefit of participation in an activity. If we know how the marginal benefits of time spent surfing the Web and reading this book change as we vary the time spent on each, then we can work out how intensely to engage in each of them.

Changes at the margin Very small changes in the level of an activity.

Suppose that starting from your current time allocation, you expect to benefit more from increasing time spent surfing the Web than from increasing time spent reading this introduction. You should then reduce your engagement in reading the book (and/or increase your time surfing the Web). The gain from increased time surfing the Web outweighs the loss from reading less. Similarly, if the marginal benefit from surfing the Web is less than the marginal benefit from reading this introduction, then you should allocate more time to reading the book (and/or reduce your time on the Web). If the marginal benefit of time spent on both activities is equal, though, you should find that any alteration in your time allocation reduces the total benefits derived from these activities, and so you have no reason to change your participation in either. The **equi-marginal principle** here takes the form that the marginal benefits of alternative uses of a resource should be equal.

Equi-marginal principle A rule that, when the resource is being used as effectively as possible, the ratio of marginal benefits to costs will be the same across all alternative uses of the resource.

We can extend the discussion by allowing for activities having costs as well as benefits. Suppose that reading a page on the Web takes one minute, while reading a page of this textbook takes

five minutes. These are the (time) costs of the activities. How should we now apply the equi-marginal principle? If the benefit from reading a Web page and reading a page of the book were equal, then in the time taken to read one page of the book, you might read five Web pages, and browsing would yield more benefits. But if the benefit from reading one more page of the book were to be five times the benefit of accessing a Web page, then the benefit from a minute spent reading the textbook would be equal to the benefit of a minute spent surfing. At the margin, the return to each unit of time is equal, and, intuitively, this seems equivalent to the outcome of the previous argument. This is not the place to set out the detail of the argument, but we can summarize the equi-marginal principle as follows (Principle 1.1):

Principle 1.1

When the ratio of the marginal benefit to the marginal cost is equal across all uses of a resource, it is impossible to reassign resources and increase the total benefits of activity.

The equi-marginal principle is extremely important. Developing our understanding of how it affects choice will take up most of Parts II, III, and V, where we consider the insights that it provides into the behaviour of consumer, the cost-minimizing behaviour of firms and the organization of the economy. In the other parts of the book, where it is not obviously central, it is still present in the background, understood as being important without attention needing to be drawn to it.

1.1.3 Markets

The application of the equi-marginal principle is central to the explanation of individual decision making in economics. In microeconomics, we are also very interested to understand more about the interactions between decision makers that involve the mutually beneficial exchange of resources. The standard modelling tool for such analysis is the **market**.

Market An abstraction from the physical concept of a place and a time at which buyers and sellers of a good or a service meet to take part in exchanges.

Simply carry out a Websearch for images of markets and you will find many examples of people meeting for one of two purposes: either to buy or to sell a relatively narrow range of goods, typically fruit and vegetables. In economics, we abstract from the concept of a market as a physical location bringing together willing buyers and sellers, and instead treat the market as a way of understanding transactions involving the purchase and sale of a single good. The typical image of a market stall shows it laden with many different types of fruit: apples, bananas, citrus fruits, tomatoes, and so forth. In our economic analysis, though, there will be distinct markets for each of these. In each market, there will be two sides: buyers seeking the goods and sellers bringing those goods to market. Thinking about the market for apples, for example, we might expect it to be very closely related to the market for pears – as apples and pears have very similar uses, someone might choose to buy pears instead of apples. Equally, we might consider it sensible not to talk about a single market for apples, but rather a market for a specific variety of apples, since there are over 8,000 varieties grown around the world. We also have considerable freedom in defining the geographical limits of the market. We may identify the market for

apples in a single town, in a region of a country, in the whole country, or even globally. How we define *the market* simply depends upon the nature of the analysis which we wish to carry out.

Just as the equi-marginal principle is an important concept in analysis of individual behaviour, so the concept of **market clearing** is essential to understanding market behaviour. In ideal, or perfect, markets, all transactions will take place at a single price, and the total quantity of the good that sellers bring to the market will match exactly the total quantity that buyers seek to purchase. We will derive the property of market clearing more formally in Chapter 2. Intuitively, though, it is reasonable to expect that in every market buyers will try to pay the lowest possible price, while sellers will charge the highest possible price. While buyers try to push the price down, sellers try to push the price up. Market clearing occurs where those forces cancel each other out.

Market clearing A situation in which potential sellers offer the quantity of a good that buyers wish to purchase.

Suppose that there is a single price charged for all transactions, but that some sellers cannot find willing buyers at that price. The quantity supplied to the market is greater than the quantity demanded. These sellers who cannot find buyers will reduce the price that they charge, and so will make sales. But this will leave other sellers unable to make sales, and so they too will cut the price that they charge.

In the same way, if there are some buyers who cannot find willing sellers at the single price ruling in the market, then the quantity *supplied* to the market is less than the quantity *demand*ed. These buyers who cannot find sellers will increase the price that they offer to pay until they find willing sellers. But this will leave other buyers unable to make their desired purchase, and so they too will increase the price that they offer.

Excess supply A situation in which potential sellers offer more of a good than buyers wish to purchase.

The higher the price of a good, the more costly it is to acquire, and the greater its value when measured in terms of other goods. The logic of the equi-marginal principle is that people will want to use less of an expensive good. As its price rises, demand for it in the market will fall, while the quantity brought to the market will increase. **Excess supply** causes the price of the good to fall, reducing the excess supply. **Excess demand** causes the price to rise, reducing the excess demand. We now have the basis for our definition of market clearing (Principle 1.2).

Excess demand A situation in which potential sellers offer less of a good than buyers wish to purchase.

Principle 1.2

*All transactions in a specific market take place at a single **market price**, for which the quantity of the good brought to market will be exactly equal to the quantity that potential buyers wish to purchase, so that there is neither excess supply of the good nor excess demand.*

The market-clearing principle is fundamental to the analysis of Parts III and IV, and also underpins much of the material presented in Part VII. Quite simply, there is almost no argument in the book that does not rely at some point on one or other of the equi-marginal and market-clearing principles, or indeed on both of them.

Market price The price at which all transactions completed in a market take place.

1.2 Market environments

Images of markets make us think of situations in which many buyers and sellers of goods come together, so that many exchanges can take place at the same time. There can be substantial differences, especially in the supply side of market environments, which can affect both buyers' and sellers' behaviour, and hence the nature of the market-clearing outcome. On the basis that everyone participates in markets regularly, at least as a purchaser, we set out the principles of organization of several types of market.

From Chapter 3 onwards we shall develop a very abstract model of decision making. We do this only so that we can better understand the ordinary behaviour in which we all engage.

1.2.1 Example: the fruit market

The central fruit market in a large city has more than fifty stalls. Many of these are almost exactly identical: they sell the same range of fruit and vegetables as each other. Members of the public are able to walk around the stalls, stopping from time to time to think about making purchases. Customers will typically point out what they want to buy, with the stall owner selecting items and putting them into a bag.

Let us consider the behaviour in the fruit market during one specific day. We assume that the stall owners purchased supplies from a wholesale market earlier in the day, and so have fixed quantities that they can sell. We shall also assume that they choose prices to ensure that when they close up their stalls at the end of the day there will be no goods left over that they have not been able to sell. That is, there are no supplies wasted because no willing buyers can be found.

By yourself

- X1.1** The fruit market is a location in the city.
- When considering pairs of goods from the viewpoint of a consumer, it is often useful to distinguish between those that are *substitutes* because either can be used to meet a particular need, and those that are *complements* because they tend to be used together. Give examples of pairs of goods traded in the fruit market that seem likely to be strongly substitutable and pairs that are strongly complementary.
 - How might a consumer approach the problem of identifying from which of the 50 sellers she wishes to buy goods? We consider here consumers who are making a single visit to the market. In what ways might people's approach differ if they are:
 - very experienced shoppers, who have used the market for several years; and
 - newly arrived in the city, and visiting for the first time?
 - How easy might it be for stallholders to give their stalls unique identities? How might experienced shoppers distinguish between stalls?
 - Suppose that the market is owned by the city council, which rents space to stallholders. What extent of variation in rents might there be?
 - How easy would you expect it to be for new stalls to set up in the market?

1.2.2 Example: bakeries on an island

Two bakeries provide all of the bread sold in a small town, located on an island. Each of the bakeries owns a general store, and there is nowhere else that the local inhabitants can buy bread. The bakeries use the same technology, and both make exactly the same range

of goods. Every night, the bakers decide how many loaves to bake, with the intention of charging prices the next day to ensure that by late afternoon every loaf has been sold: there will be no waste in production. To emphasize the extent of uniformity in supply, the general stores are next door to each other, with the bakery counters set out in exactly the same way.

By yourself

- X1.2** We assume that the bakeries produce a single standard 800g loaf and that they use the same technology. Presented with a loaf from each bakery, consumers would not be able to distinguish between them.
- How easy would it be for someone recently arrived in the town to confirm whether the experience of buying bread is almost identical at both locations?
 - To what extent do you think that each bakery would have loyal customers, who would prefer buying bread from that bakery rather than from its competitor? Would your answer be different if the two shops were at opposite ends of the main shopping street?
 - Suppose that one bakery were to increase the price of a loaf by £0.10. Before the price change, both bakeries were selling 1,000 loaves per day. How might sales (at each bakery) change as a result of the price change? What do you conclude about the prices that the two shops will set?
 - There are two firms in this market. What characteristics of the market might prevent other bakeries from setting up in business?

1.2.3 Example: cafés in a small town

Suppose two cafés face each other across the main street in the small town where I live. They are the only places there in which I can buy a cup of coffee. Both brew fresh coffee on demand. While the cafés have to maintain a stock of raw materials for making coffee, they do not keep a stock of the finished product, instead producing it to order. There is no limit to the number of cups of coffee that the cafés can sell in any day, so long as they do not run through their stock of supplies. We assume that they set prices at which they can expect to operate close to their physical (seating) capacity, at least during the peak hours for business, between 10.30 a.m. and 3.00 p.m. This town lies about five kilometres from neighbouring villages and their nearest potential competitors.

By yourself

- X1.3** We assume that the cafés sell a standard cup of coffee.
- How would someone newly arrived in the town determine the price that they would be willing to pay for a coffee at each café? If there is no difference between the willingness-to-pay measures for the two cafés, what do you conclude about the price that the cafés will set?
 - Were one café to reduce its price by £0.10, what would you expect to happen to sales of coffee in the two cafés?
 - Suppose that one café decides to differentiate itself from the other one by using certified coffee. (Certification schemes for coffee cover organic production, environmental protection, and fair trade.) Explain how this might affect the cost incurred in making a cup of coffee, but also the price that potential customers might be willing to pay.
 - This market is served by two cafés. What characteristics of the market might ensure that no one else decided to set up a third café?

1.2.4 Example: petrol stations in a city

Three petrol stations lie on the route that I usually take while driving to work. Each one is a separate business and each is affiliated to one of the major oil companies, which act as distributors throughout the country. Whichever petrol station I use, I know that the fuel will have been refined at a single plant, owned by a specialist company. While there might be small differences in the range of additives that each of the oil companies insists should go into their fuel, differences in performance are so slight that I have never been able to detect them. Like most drivers, I am free to choose a different petrol station every time I need to buy petrol. All three petrol stations are situated on major roads close to the edge of my town. They therefore all have several competitors within five kilometres. Each petrol station also has large reservoirs of fuel. Given the prices that they charge for petrol, an order to refill these reservoirs can be completed well before they are emptied.¹

By yourself

- X1.4** In this case:
- How might we define the market?
 - I regularly use all three petrol stations on this route because I find this to be convenient. How might someone who has never driven on this route make decisions about which petrol station to use?
 - How might the willingness to pay for fuel at a given petrol station differ between the time when I plan my journey and the time when I turn off the road onto that petrol station's forecourt?
 - Suppose that I usually buy about 40 litres of petrol at a time and I notice as I pull onto the forecourt that the petrol station has increased its price by £0.05 per litre. How might that affect my decision about which petrol station I use?
 - Suppose that I see no difference in price from the last time I used a particular petrol station. How might this affect my decision making?
 - How do you think two petrol stations might sustain a difference in price of £0.05 per litre over a period of a year?

1.2.5 Example: hairdressing in a small town

In the town in which I live there are five hairdressing salons. All offer a similar range of services, but each has a distinctive character. Whether or not there are differences in quality between the services they provide, there are certainly substantial differences in the prices each charges for services that seem to be very similar. Customers tend to make appointments a few days or a few hours in advance. The capacity limit of the businesses will be reached when their diaries for any day are completely filled.

¹ While it might seem that in this case the law of one price should definitely hold, Fredrik Hansen, a student, demonstrates in his essay that there are in fact persistent differences in prices at different petrol stations, and argues that these are so large that they cannot easily be explained by an argument based on time savings. You can read Fredrik's argument (and other student essays) on the companion website for this book, at www.palgrave.com/mochrie.

By yourself

- X1.5** While the range of services provided by the hairdressers is essentially the same, we expect the method of delivery to differ across salons. We say that there is product differentiation across the salons.
- To what extent might these salons face competition from businesses in other towns?
 - Thinking of the measures of willingness to pay and willingness to accept, what might be the effects of allowing product differentiation on choice?
 - How important do you consider repeat business will be to the success of a salon?
 - Suppose that the price charged in a salon increases by 10%. What effect might this have on the business of the salon?
 - Suppose that all five salons cut their prices by 10%. What effect might this have on their business?
 - Salons might charge different prices for men and women. Why?

1.2.6: Example: rail travel

Once I have made the decision to travel from my house to Edinburgh by train, the only choice that I can make is the time of travel. There is one railway track, and only one company runs trains on it. Of course, on any given train passengers might be paying different prices. Compared with the price that I would pay travelling early in the morning to work when the train is busiest, children, students, older people, more regular travellers, and even I, were I to travel after 9.30 a.m., all pay less. Yet all passengers enjoy the same service. If anything, those travelling during the peak period, who may be obliged to stand in cramped conditions, might experience the lowest quality of service while paying the highest price.

By yourself

- X1.6** Consider the railway service between two cities.
- Between most pairs of cities, there is only one train operator. How might the lack of alternative suppliers affect the price that potential buyers will have to pay?
 - Once a train operator has made a decision to run a service, what is the lowest ticket price that the operator might set for carrying an additional passenger?
 - Given that there are periods of the day in which there are capacity constraints, how might train operators manage demand at these times? In this case, what might lead to differences in the amounts that passengers would pay to travel on a particular train?
 - Assume that the operating company sets a standard price for travel on the same day. Give examples of discounts that might be offered to different types of passengers, and discuss the rationale for offering these.

1.2.7 Market structures

The structure of the market is different in each of the examples we have considered here, and in some cases the difference is substantial. For example, with the train company there is very limited direct competition. I do have alternatives when making the journey: I could drive, or take a bus, or cycle, or even run. But there is only one train company. With the petrol stations, there is no uncertainty over the number of

suppliers or the quality of the fuel that they sell, but when visiting a given petrol station I cannot know for certain whether the others are selling fuel at the same price, more cheaply, or at a higher price. Once I am on the forecourt of any petrol station, though, it would be unusual were I to change my mind and buy fuel elsewhere. With this example, I have to make a decision without being fully informed about the alternatives.

In comparison, when buying bread or going out for a cup of coffee, the situation is quite different. I can easily become fully informed about prices, and so it might seem reasonable that I should expect to see the same prices. However, there are subtle differences in the production processes. The bakeries cannot change their output during the day, so if one bakery cuts the price without increasing the quantity of bread baked in advance, that bakery will make all of its sales at the start of the day. The other bakery will make its sales at the full price later in the day, when the first bakery has sold all its loaves. Price cutting here has few benefits for the bakeries. For the cafés, the situation is rather different. They wait until an order is placed before producing their output. Neither café wants to set the higher price, so price competition will be very intense.

We therefore see from these examples that we should not expect all markets to be the same. We should also note that the bulk of the differences across the market are likely to be found among the sellers – we would expect individual consumers to have very limited market power. It does not matter much to a local bakery whether I purchase a loaf from that bakery or from its competitor – I have very little effect on the total sales. In the same way, the train operator, the petrol station, the local café, the hairdresser, and the stallholder in the fruit market do not consider it particularly important that they have my custom. However, I would certainly notice the difference if my local train station closed, or if the petrol station that I have used most regularly for the last 18 months closed because of competition from a nearby supermarket that was able to undercut it substantially, or if price competition between the bakeries were eventually to lead to one closing, or even if my preferred hairdresser finally decided that the time had come to shut his shop and spend more time with his grandchildren. When we consider the assumptions required for a perfect market (in Chapter 2), we shall see there are several assumptions about the behaviour of firms, but only one about the people who demand goods and services.

The discussion also suggests that the intensity of competition within a market can differ substantially. It seems reasonable that the train operator, which has a monopoly of supply, should have considerable power in the market and so should be able to make profits. It also seems reasonable that the cafés, even though each has only a single competitor, should face quite intense price competition. The petrol stations, the hairdressers, and the bakery all seem to be in an intermediate stage. The most competitive market, though, is the fruit market. There are many sellers; their prices and goods can be inspected very easily, so buyers should be fully informed; and on any day, suppliers are interested in selling a fixed quantity of output. All of this seems likely to push prices down and to make the market highly competitive. In Chapter 2, such a market will be our starting point.

Summary

In microeconomics, we assume that all behaviour has a purpose, which is to enable the achievement of some objective.

Decision makers choose the actions that maximize benefits (net of costs). We formalize this in the equi-marginal principle, that when the ratio of the marginal benefit to the marginal cost is equal across all uses of a resource, it is impossible to reassign resources and to increase the total benefits of activity.

We analyse the exchange of goods and services in markets. Typically, we wish to identify the

market-clearing condition, defined as the price at which goods and services are bought and sold, such that the quantity brought to the market equals the quantity demanded. With market clearing, the good is neither in excess demand nor in excess supply.

We consider markets to be competitive when there are many buyers and sellers, all of whom are perfectly informed.

We consider that sellers have market power if they are able to affect the price charged or the quantity traded. This will often mean that there is limited competition in supply.

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Index

Entries for figures are in **bold**. Entries for tables are in *italics*.

- abatement cost 427, 428, 615
- abundance 38
- acceptability 379 *see also* preferences
- access charges 414 *see also* two-part tariff
- acquisition cost
 - consumption bundles 37, 43, 45–52, 55, 59
 - isocost line 184
 - production 184
 - utility functions 86
- action profile (outcome) 323, 324, 349, 547, 615 *see also* Nash equilibrium
- adaptive processes 519, 523, 530, 542
- adjustment 530–2
- advances in technology (technological progress) 17, 615
- adverse selection 511, 555–7, 560, 615
- advertising 77–8, 583–7, 588, 589
- affordability 41–4, 393
- affordability constraint
 - bounded rationality 525
 - Cobb-Douglas utility 107, 108
 - consumption profiles 477, **478**, 479, 485
 - definition 37, 42, 59, 615
 - endowments 53–4
 - exchange economy 378, 379, 381, 383
 - explicit form 47, 54
 - general equilibrium 407
 - income changes 51–2
 - negative prices 460
 - opportunity cost 48
 - pivoting 51, 55
 - preferences 68–9
 - price changes 49, **50**, 51–2, 142–3, 146, **147**, 479
 - properties 47–9
 - shifting 51, 55
- affordable set
 - compared to preference ordering 59, 61
 - definition 43, 615
 - education choices 495
 - endowments 54
- air travel 295–6, 297
- Akerlof, George 556, 558, 611, 612
- Allais' paradox 535–6, 541
- anchor 530, 615
- anchoring 530–2, 536, 539, 543
- arc elasticity 175
- Arm or Trade game 329
- Arrow's Impossibility Theorem 441–2, 447, 615
- artificial monopolies 278, 281–2, 615
- ascending (English) auctions 288–9, 301, 590, 591–2, 596–7, 609, 616
- asset hire 182
- asset markets 474, 490–3, 497
- assets 201, 220
- asymmetric information 545–7, 555, 558–9, 565, 566, 588, 611
- AT&T 280, 281
- attributes 561, 615
- auctioneer 387, 390, 615
- auctions
 - all-pay auctions 604
 - common values 600
 - definition 590, 615
 - direct selling mechanism 604
 - Dutch (descending) auction 592, 597, **599**, 616
 - English (ascending) auction 288–9, 301, 590, 591–2, 596–7, 609, 616
 - first-price auction 592, 597–8, 602–4, 606, 607, 608, 609, 616
 - imperfect information 599–604, 609
 - mechanism design 608–9
 - perfect information 592–9, 609
 - perfect price discrimination 285, 288–90
 - private values 600
 - Revenue Equivalence Theorem 604–8, 609
 - sealed-bid auction 289, 592, 597–8, 602–4, 619
 - shading 603–4, 607, 609
 - Vickrey (second-price) auction 591, 592, 593–6, 598, 600–1, 604, 607–8, 609
- availability (heuristics) 532–4, 535, 543, 584, 615
- average cost 200, 615 *see also* cost functions
- backward induction (maths) 350, 352
- Battle of the Sexes game 548–53
- Bayes-Nash equilibrium 547, 557–8, 566, 599–600
- Bayesian learning 554, 555, 561, 563, 615
- Bayesian prior 549–50, 554, 615
- Becker, Gary 611, 612
- bees 413, 415, 429
- behavioural economics 535, 542, 543, 611–2, 613–4
- 'benefits traps' 464
- Bernoulli, Daniel 504
- Bertrand competition 264, 303, 320, 323, 366
- Bertrand-Nash equilibrium 343, 345–7, 366
- best-reply function *see also* reaction function
 - auctions 594–5, **599**, 602–3
 - Bayesian prior 548, 549
 - game theory 324, 325, 328, 341, 351, 352–3, 355, 361
 - price setting 317–9, 346–7, 572–3, 574, 581
 - public goods 434–5, 444
 - quantity setting 311, 312, 314, 315, 345
- bias 519, 527–35, 542, 543, 612
- binary relation (maths) 62, 63–4
- binding (maths) 42
- bliss point 71, **72**, 74, 116, 615
- 'BOGOF' offer 290
- bonds 474, 490–1, 497
- bounded rationality 525–7, 543, 619

- branding 520, 584, 588
- breakeven price 20
- broadcast signals 368, 431, 433–4
- budget (affordability) constraint *see* affordability constraint
- budget (affordable) set
 - compared to preference ordering 59, 60
 - definition 43, 615
 - endowments 54
- bundling 294–6, 302

- cancellation (prospect theory) 538
- capacity constraints 11
- capital gains 492–3
- capital input
 - definition 183, 201, 220, 615
 - fungible 220, 232
 - long run market equilibrium 257, 260
 - non-fungible 221–3, 232
 - short run 223, 226
- cars, secondhand market 554–61, 566
- cartels 343, 353–8
- Cartesian diagrams 41
- CES *see* constant elasticity of substitution (CES) functions
- chain rule (differentiation) 99
- Chamberlin, Edward 587–8
- changes at the margin 5, 615
- characteristics 468–71, 473, 520, 528, 561, 615
 - see also* location; quality
- charity donations 80n
- Chicken game 329
- choice *see also* consumption profiles; rationality; risk
 - affordable set 43
 - behavioural economics 3–4
 - characteristics selection 468–71
 - conspicuous consumption 454–8, 472, 473
 - education choices 493–6
 - information access 449–50
 - labour/leisure time 459–65, 610
 - learned responses 519
 - social context 5, 450
 - subsistence 451–4, 472
 - theory of choice 36, 612
- climate change *see* pollution
- closed sets 44
- Coase, Ronald 413, 434
- Cobb-Douglas production function 191
- Cobb-Douglas utility
 - concepts 88–89
 - constant elasticity of substitution 156, 164
 - exchange economy 379, **380**
 - homogeneity 106
 - marginal utility 101–4
 - preferences 107–9
 - production functions 255
- coding (prospect theory) 538
- cognitions 520, 532, 615
- cognitive dissonance 529, 615
- collusion 353–7, 615
- combination (prospect theory) 538
- common property resources 444, 446, 447, 615
- common values 600, 615
- communication 545–6, 547, 566 *see also* signalling
- commuters 414, 420
- compensated (Hicksian) demand
 - concepts 139–42
 - constant elasticity of substitution (CES) functions 166–7, 169–74, 177
 - definition 143, 156, 157, 615
 - demand curves 151
 - price changes 146, 154–5
 - production functions 204
 - substitution effect 144, **145**
 - total effect 147–53
- competition *see also* perfect competition; product differentiation
 - imperfect 303–4
 - intensity variation 12
 - location 570–1, 575–80, 589
 - market power effect 21
 - prices 571–2, 581–3, 589
 - quality 583, 589
- competitive advantage 419
- competitive games 332–3, 341, 342, 358–64, 366, 615
- complements 8 *see also* perfect complements
- completeness 63, 81, 84, 512, 615
- compound interest (maths) 487–8, 489
- concave functions (maths) 46
- congestion (transport) 414, 420, 431–2, 444
- conjecture
 - definition 305, 615
 - game theory 324
- conscious consideration *see* rationality
- consistent conjectures 307–8, 323, 326, 615
- conspicuous consumption 451, 454–8, 472, 473, 615
- constant elasticity of substitution (CES) functions
 - concepts 89–91, 92, 94
 - convexity 161–2
 - definition 156–7
 - demand functions 165–9
 - Hicksian (compensated) demand 169–74, 177
 - homogeneity 106, 159, 177
 - indifference curves 162–4
 - marginal utility 159–60
 - production functions 190–1, 198, 202–3, 212–4
 - social welfare function 411
 - well-behaved preferences 174–6, 177
- constant rule (differentiation) 99
- constrained maximization 111, 615
- constrained optimization 310, 312, **313**, **317**, 321, 376
- constraints, multiple 380
- consumer surplus 26, 274, 285–6, 292, 314
- consumers *see also* conspicuous consumption
 - private production process 181–2
 - second-degree price discrimination 291
 - theory 36
- consumption bundles *see also* endowments; perfect complements; perfect substitutes
 - acquisition cost 41, 43, 45–52
 - bliss point 71, **72**, 74
 - concepts 36
 - conspicuous consumption 455, 457–8, 473
 - definition 37, 40–1, 55, 615

- endowments 53
- exchange economy 370–1, 381, 382–3, 393
- least expensive, acceptable 110–4, 117, 140–1, 183
- marginal rate of substitution (MRS) 71
- most-preferred, affordable 68–9, 97, 107–10, 116, 144, 382–3
- preferences 57–9, 67–8, 405
- satisficing 525–6
- subsistence 452–3, 472
- two-part tariff 293–4
- utility functions 80
- consumption profiles
 - concepts 474–5, 496–7
 - definition 615
 - multi-period model 484–7
 - two-period model 475–84
- continuity 513
- contour maps (maths) 45, 101
- contract curves (Pareto set)
 - definition 369, 373, 392, 618
- indifference curves 390, 391
- two-person, two-factor, two-good model 401, 402–3
- convex sets (maths) 42, 44
- convexity
 - constant elasticity of substitution 161–2
- cost functions 210
 - definition 67, 615
 - labour input 459–60
 - preferences 46–7, 76
 - well-behaved preferences 85
- coordination games
 - concepts 329–32, 339–40, 341, 342
 - definition 615
 - extensive form 348–9
 - incomplete information 547–53
 - mixed strategies 343, 364–5, 366
- copyright 18, 281–2
- cost functions *see also* marginal costs
 - average 200, 208–11, 212–5, 217–9, 229, 230–2
 - definition 200, 204–8, 218, 220, 616
 - homogeneity 245
 - long run 257–8
 - monopolies 269, 271, 273
 - oligopolies 305, 306
 - profit maximization 236–7, 239, 240–2, 244, 245, 246–7, 248
 - returns to scale 211–2, 213, 214–5, 217, 218
 - short run 246, 257–8
- costs of production *see also* cost functions
 - concepts 183–4, 200–8
 - definition 18, 210, 616
 - externalities 413, 414–5, 422, 427
 - monopolies 269, 271, 273
 - private costs 422
 - production functions 234
 - profit maximization 254
 - public goods 444–5, 447
 - short compared to long run 226–8, 231–2
 - social costs 422
- Cournot conjecture 264, 305–8, 316, 320, 321, 323, 616
- Cournot-Nash equilibrium 343, 344–5, 354, 356, 366
- debt finance 201
- decision making *see* choice
- definite integral (maths) 272–3
- demand *see also* elastic demand; excess demand; Hicksian (compensated) demand; individual demand; market demand; Marshallian (ordinary) demand
 - individual insignificance 16, 20
 - law of demand 151
- demand curves 118, 128–9, 137, 138, 151, 250
- demand functions *see also* inverse demand function
 - conspicuous consumption 456–7
 - constant elasticity of substitution (CES) functions 165–9
 - definition 118, 128, 616
 - elasticity of demand 131–5, 137
 - market demand 255
 - monopolies 267, 271, 277
 - perfect complements 255
 - price changes 234, 523–4
- demand shocks 225, 258, 260, 309
- derivative function (maths) *see also* partial derivatives (maths)
 - local maximum 215
 - local minimum 216
 - optimization 213
 - rate of change 96–7, 98, 273
 - sum of increments 268–9
 - useful examples 100
 - zero derivative 214
- descending (Dutch) auction 592, 597, 599, 616
- dictatorship 441–2
- differentiation (maths) 98, 99–100
- differentiation (products) *see* product differentiation
- direct selling mechanism 604
- discount factor 480–3, 486, 487, 497, 616
- distribution 408–11, 412
- domain set (maths) 44
- dominance (maths) 327
- dominant strategy 326, 328–9, 341, 616
- dominant strategy equilibrium 326, 327–8, 341, 616
- duopolies 304 *see also* oligopolies
- Dutch (descending) auction 592, 597, 599, 616
- eBay 289, 590–1, 609
- economic efficiency
 - definition 114, 179, 207, 616
 - resource allocation 169, 205, 207, 225, 232, 397
- economic geography 419
- economic surplus 22, 23, 616
- Edgeworth-Bowley box 369
- Edgeworth box 369, 372, 392, 396–7, 403, 406, 407
- editing (prospect theory) 537–9, 543
- education choices 474, 493–6, 497, 564, 566, 611, 613
- efficiency *see also* economic efficiency; technical efficiency
 - exchange economy 387–91, 392, 393
 - markets 14
 - production 398–400, 411–2
 - resource allocation 5

- elastic demand
 - definition 130–1, 137–8, 616
 - monopolies 265, 274–5
 - second-degree price discrimination 291–2, 294
 - standard theory 265–6
 - third-degree price discrimination 297, 302
- elasticity (maths) 122, 123, 124
- elasticity of substitution 90, 93, 94, 156, 174–6, 616
- election campaigns 360, 532, 570
- Emissions Trading Scheme (ETS) 428–9
- endowment effect 528–9
- endowments *see also* consumption bundles
 - concepts 52–4, 56
 - exchange economy 368, 369, 370–2, 375, 381, 388
 - factors of production 393, 403
 - time 461
- Engel curves 118, 119–23, 137, 138, 616
- English (ascending) auctions 288–9, 301, 590, 591–2, 596–7, 609, 616
- entrepreneurship 197
- envelope 409, 616
- equi-marginal principle
 - concepts 5–6
 - costs of production 218
 - definition 3, 5, 13, 616
 - negative prices 458
 - opportunity cost 39
 - preferences 69
 - resource allocation 95–8, 114, 117, 610
- equity 408–11
- equivalence theorem 605–7
- Euler number (maths) 489
- eventually diminishing returns to scale
 - concepts 214–7, 218–9
 - definition 214, 616
 - homogeneity inconsistency 261
 - long run 257, 262
 - market clearing 251
 - perfect competition 241, 243, 248, 261
 - perfect market assumptions 16, 19–20
- evolution, human 535, 543
- excess demand
 - definition 7, 616
 - exchange economy 374, 385–6
 - externalities 429
 - Walras' Law 387, 392
- excess demands, definition 616
- excess supply
 - definition 7, 616
 - exchange economy 374, 386
 - externalities 414, 429
 - public goods 433
- exchange economy
 - affordability constraint 378, 379, 381, 383
 - concepts 367–8, 369–76
 - definition 370, 392, 616
 - efficiency 387–91, 392, 393
 - equilibrium 387–91
 - marginal rate of substitution (MRS) 369, 372, 375, 379, 381, 383, 390
 - market clearing 381, 384–5, 386–7, 390, 392
 - monopoly power 390–1
 - Walrasian equilibrium 382–7, 392
- excludability 432, 447, 616
- expected utility 503–12, 616
- expected value (probability) 503, 616
- expenditure constraint 112–4, 117, 168–9, 177, 378, 616
- expenditure share 120, 616
- experience goods 469, 616
- experiments 613–4
- extensive form of game 347–53, 366, 585–6, 616
- externalities *see also* negative externalities
 - Bayesian learning 555
 - characteristics 565, 566
 - common property resource 444–5, 447
 - definition 413, 414, 430, 616
 - negative in production 420–9
 - positive in production 414–20
- factors of production *see also* capital input; labour input
 - definition 182, 616
 - economic efficiency 207
 - general equilibrium 393, 399, 402, 403–4, 407
 - market power 205
 - ownership 367, 369
- fast-moving consumer goods (FMCGs) 17, 588
- financial asset trading 474, 490–3, 497
- firm supply *see* individual (firm) supply
- firms
 - definition 181, 616
 - perfect market assumptions 15
 - smallness 249
- first-degree price discrimination *see* perfect price discrimination
- first-order conditions (maths) 378, 380
- first-price auction 592, 597–8, 602–4, 606, 607, 608, 609, 616
- fish farming 420–1
- fisheries management 445–6
- fixed assets 220, 222–3
- fixed costs 208, 209, 217, 220, 227, 232, 245–7
- free riding 431, 434–5, 442–4, 446, 447, 616
- functions (maths) 44, 46, 101, 377, 379 *see also* derivative function (maths)
- fungible assets 220, 232, 616
- future value 477, 484, 616
- gambler's fallacy 501
- game 322, 616
- game theory *see also* auctions; coordination games; dominant strategy; Nash equilibrium; Prisoners' Dilemma game; product differentiation
 - asymmetric information 545–6, 547, 555, 558–9, 565, 566
 - Battle of the Sexes game 548–53
 - behavioural economics 613
 - cartels 353–8
 - competitive games 332–3, 341, 342, 358–64, 366, 615
 - concepts 264, 322
 - coordination games 329–32, 339–40, 341, 343, 547–53
 - extensive form of game 347–53, 366, 585–6, 616
 - free riding 434–5
 - mixed strategies 343, 358–65, 366, 548–9, 550

- normal form 324, 337–9, 355–6
 signalling 561–5, 566, 567, 584–5, 588, 589
 strategic game of complete information 323–4,
 340–1, 343–4, 347–53, 366, 547, 620
 technology choice 324–7
 trigger strategy 358
 trust 340, 357
 game trees (maths) 349
 games of chance 333, 358
 general equilibrium
 definition 367, 370, 616
 exchange economy 382, 387, 390
 production 393–6, 412, 610
 public goods 437
 two-person, two-factor, two-good model 396–407,
 412
 geometric sequence (maths) 489
 Giffen behaviour 453–4, 471, 472, 616
 global positioning system (GPS) *see* broadcast signals
 government *see also* taxation
 social planner 411–3, 423–6, 428–30, 440, 447, 612
 subsidies 280
 gross complements 174
 gross substitutes 174

 habituation 521, 527
 happiness 153–4
 Hardin, Garrett 444–5
 Hawk-Dove 329
 heuristics 527–8, 532–5, 543, 545, 584, 616
 Hicksian (compensated) demand
 concepts 139–42
 constant elasticity of substitution (CES)
 functions 166–7, 169–74, 177
 definition 143, 156, 157, 615
 demand curves 151
 price changes 146, 154–5
 production functions 204
 substitution effect 144, 145
 total effect 147–53
 history (game theory) 350, 366, 617
 homogeneity
 Cobb-Douglas utility 106
 constant elasticity of substitution (CES)
 functions 159
 cost functions 245
 maths explanation 106
 production functions 190–1, 196–8, 202–3, 212, 214,
 218, 245
 returns to scale 196–7, 211, 213, 261
 homogeneity of degree t 106, 617
 horizontal differentiation 568, 570, 575–80, 588–9, 617
 Hotelling model 568–9, 577, 587, 588–9
 house buying/renting 468–9, 528, 592
 household economic choices 451, 466–8, 472, 473, 611
 human capital 474, 494, 564, 611, 613
 hybrid technologies 187, 197

 image (maths) 44
 incentive compatibility 294, 587, 617
 income effect
 compensated (Hicksian) demand 145
 constant elasticity of substitution (CES)
 functions 171–2, 177
 definition 139, 144, 147, 157, 617
 Hicksian (compensated) demand 148–9, 156
 Marshallian (ordinary) demand 145
 normal goods 151
 perfect complements 150
 rate of change 152
 income elasticity of demand 123–6, 129, 137–8, 617
 income expansion path
 definition 108–9, 117, 617
 Engel curves 119–21
 income effect 149
 income offer curves 126–7
 indirect demand 141
 perfect complements 254–5
 price changes 142
 income offer curves 118, 126–7, 137, 138, 382–4, 617
 income profiles 474, 478, 482, 484–5
 income tax 52n, 368, 392
 incomplete information 551, 565, 617 *see also*
 asymmetric information
 increments (maths) 268–9, 270
 independence (probability) 501, 513, 517, 536, 617
 indifference 58, 62, 75, 617
 indifference curves
 constant elasticity of substitution (CES)
 functions 162–4
 definition 57, 62, 617
 elasticity of substitution 176
 exchange economy 371, 372, 388, 390, 391
 non-standard preferences 71, 72, 74
 positional consumption 457–8
 second-degree price discrimination 291
 standard theory 75
 tangents 69, 70, 75
 utility functions 79–80, 83–4, 92
 well-behaved preferences 67
 indifference maps 101, 105
 indirect utility 154, 167–8, 177, 379, 617
 individual demand 25–9, 34, 617
 individual (firm) supply *see also* supply function
 definition 29, 617
 market equilibrium 249–50, 251
 market power 263–4
 willingness to accept (WTA) 29–30, 34
 industrial districts 419–20, 429
 inelastic demand 130–1, 616
 inferior goods 121, 122, 151, 617
 inflation 479–80
 information access *see also* asymmetric information;
 incomplete information; perfect information
 behavioural economics 449–50
 perfect market assumptions 16, 21, 449, 519
 innovation 283, 284 *see also* technological progress
 (advances in technology)
 insolvency 201
 instantaneous utilities 480, 617
 insurance 498, 499, 509–12, 514–6, 517, 518, 529
 integration (maths) 272–3
 intellectual property rights 18, 281–2, 283, 284
 interest on capital 183–4

- interest, simple and compound (maths) 487–9
- intransitivity 65–6
- inverse demand function
 definition 234, 617
 monopolies 267, 269, 274, 277, 283
 oligopolies 304, 306, 312, 315
 perfect competition 237, 238, 253
 perfect price discrimination 287
- isocost line 184, 199, 203, 205, 226, 617
- isoprofit curves 310–2, 313, 316, 353, 354, 357, 617
- isoquants
 definition 187, 617
 marginal rate of technical substitution 193, 198, 399
 production functions 188, 189
 technology continuum 195, 199
- iterative dominance (maths) 327, 329
- job markets 563–5
- Kahneman, Daniel 532, 534, 612
- Krugman, Paul 419
- labour contracts 224–5
- labour input
 contract types 182, 464–5
 definition 184, 200, 617
 income/leisure choice 462–4, 472, 473
 negative price of time 459, 473
 short run 224–5, 226–7, 251–2, 253
 skilled and unskilled 200
- Lagrangean function (maths) 377
- Lagrangean multiplier (maths) 379, 380, 404, 405
- law of demand 151
- law of small numbers, the 534, 617
- learned responses 519, 521–3, 535, 542, 543
- leisure time 460–5
- liabilities 201
- licensing 424–8, 430
- linear functions 85, 133–5, 137
- linear transformations 77–8
- loans 488–90
- location 568, 570–1, 575–80, 589
- London Olympics 221–2
- long run
 definition 223, 617
 market equilibrium 257–61, 262
 monopolies 270–1
 planning period 224–5, 232
 production functions 252, 397
 supply function 245, 246
- loss aversion 519, 535–42, 617
- lotteries 498, 505–6, 507, 512–7, 535–6, 551, 617
see also prospects
- luxuries 125–6
- marginal abatement cost 427
- marginal costs *see also* equi-marginal principle
 constant elasticity of substitution (CES)
 functions 212–4
 definition 200, 208–11, 218, 236, 617
 elastic demand 265–6
 externalities 413, 422, 430
 long run 257–8
 monopolies 267–8, 273
 profit maximization 236–7, 239–42, 244, 245, 246–8, 253, 256
 public goods 444–5, 447
 returns to scale 214–5
 short run 227–30, 232, 246, 253, 257–8
 third-degree price discrimination 299
- marginal product
 Cobb-Douglas production function 191
 definition 181, 190, 199, 617
 diminishing 192–3, 196, 395
 externalities 415
 marginal cost relationship 229–30
 marginal rate of technical substitution 395
 Pareto efficiency 400–1
- marginal rate of substitution (MRS)
 characteristics selection 470–1, 473
 Cobb-Douglas utility 88–9, 108
 concepts 68–71
 consumption profiles 477–8, 483
 definition 75, 96, 104, 117, 617
 elasticity 160, 174–5, 177
 exchange economy 369, 372, 375, 379, 381, 383, 390
 general equilibrium 404, 407
 labour input 460
 price ratio 165, 166, 379
 public goods 438, 439–40
 risk 515–6
 ‘Robinson Crusoe’ economy 396
 utility functions 81–3, 84, 85
- marginal rate of technical substitution (MRTS)
 definition 193, 199, 617
 elasticity 198
 isoquants 193, 198, 399
 price ratio 196, 199, 203, 204, 412
- marginal rate of transformation (MRT) 403, 404, 407, 412, 470–1, 473, 617
- marginal revenue
 monopolies 268, 271, 274, 275, 283
 perfect competition 236, 247, 253
 public goods 437
 third-degree price discrimination 300–1
- marginal utility
 Cobb-Douglas utility 101–4, 108
 constant elasticity of substitution 159–60, 177
 consumption profiles 477, 487
 definition 77, 81–2, 83, 94, 96, 100, 617
 derivation 100–4
 diminishing 84, 88–9, 107
 functions 98–104
 income/leisure choice 461, 462, 610
 money 155
 negative prices 458
 public goods 439–40
- marginal utility of a good 80, 82, 617
- market clearing
 concepts 22–4, 32–3
 definition 7, 13, 617
 exchange economy 381, 384–5, 386–7, 390, 392
 externalities 428, 430
 long run 260
 market equilibrium 250, 256, 610
 monopolies 272

- oligopolies 305
- perfect competition 240
- profit maximization 250–1
- market coverage 470, 571, 577, 617
- market demand
 - definition 28, 254, 617
 - individual demand 28–9
 - market equilibrium 249–50, 254, 255, 259
 - monopolies 266–7, 271
 - oligopolies 312
 - public goods 435–7
- market equilibrium
 - definition 249–50, 262, 617
 - demand shocks 309
 - long run 257–9, 262
 - oligopolies 309, 319–20
 - short compared to long run 259–61
 - short run 254–6, 262
- Market for Lemons game 555–60, 566
- market power
 - bundling 296
 - competition effect 21
 - consumers 12
 - definition 16, 263, 265, 617
 - exchange economy 390–1, 392
 - factors of production 205
 - network externality 280
 - price discrimination 285, 302
 - price setting 320
 - product differentiation 570, 575, 579
 - quantities compared to prices 303
 - quantity setting 312–5
 - sellers 12, 13
- market price
 - definition 7, 618
 - firm supply 233
 - long run 258
 - market equilibrium 256
 - oligopolies 303, 305, 307
 - perfect competition 238, 239, 247, 248
 - short run 251
 - supply restriction 263–4
 - willingness to accept (WTA) 23–4, 29–30
 - willingness to pay (WTP) 23–4
- market supply
 - definition 30–1, 618
 - long run 260, 262, 320
 - market equilibrium 249–50, 251, 259, 262
 - monopolies 271
 - profit maximization 252
- marketing *see* advertising
- markets *see also* perfect market
 - concepts 6–11
 - definition 6, 618
 - structures 11–2, 14–5
- Marshall, Alfred 419
- Marshallian (ordinary) demand
 - constant elasticity of substitution (CES)
 - functions 165–6, 173, 177
 - definition 139, 143, 156, 157, 618
 - demand curves 151
 - price changes 146, 147–8, 152
 - total effect 144, 145
- mechanism 442, 608, 618
- median voter 570, 618
- median voter theorem 570, 618
- method of equal gradients 110, 618
- Microsoft 280–1
- minimand function 98, 99
- minimax strategy 365, 618
- mitigation 499
- mixed strategies 343, 358–65, 366, 548–9, 550, 618
- money
 - role of 38
 - utility 153–5, 156
- monopolies *see also* welfare loss of monopoly
 - competition 587–8
 - definition 265–6, 618
 - elastic demand 274–5
 - long run 270–1
 - market power 266–77, 390–1
 - profit maximization 266, 267–8, 271–4, 275–7, 278, 283
 - monotonically increasing transformation 78–80, 104–5, 107, 160, 513, 618
- monotonicity
 - definition 63–4, 66, 75, 618
 - income effect 146
 - labour input 459–60
 - well-behaved preferences 84
- moral hazard 511–2
- multiple constraints (maths) 380
- music industry 282
- mutual insurance 510–2, 518
- Nash equilibrium
 - auctions 594–5, 598, 599, 601, 603, 609
 - Battle of the Sexes game 548, 549, 550, 551, 553
 - Bertrand-Nash equilibrium 345–7, 366
 - coordination games 331, 332, 341–2, 365
 - Cournot-Nash equilibrium 344–5, 354, 356, 366
 - definition 264, 322, 323–4, 326, 341, 547, 618
 - dominant strategy equilibrium 327–8, 341
 - games in normal form 324, 326–7, 337–9, 355–6
 - Prisoners' Dilemma 334, 336
 - product differentiation 573, 574–5, 578–9, 581–2, 589
 - strategic game of complete information 343–4
 - sub-game perfection 350, 352–3, 366
 - symmetric games 329, 330
- natural experiments 614
- natural monopolies 264, 265, 278–81, 283, 618
- negative externalities 413, 415, 420–9, 545, 618
- negative prices 458–60, 473
- net complements 174
- network externality 280, 618
- nominal income 146, 618
- normal goods
 - definition 122, 618
 - demand curves 121, 151
 - income effect 138, 151
 - law of demand 151
 - substitution effect 151
- numeraire 382, 394, 618

- odds ratio 515
- offer curves 382–4 *see also* income offer curves; price offer curves
- oligopolies
 - assumptions 303, 305
 - definition 264, 303, 320, 618
 - examples 304
 - game theory 323, 327, 334–5, 343–7, 366, 545
 - price setting 317–20, 321
 - quantity setting 304–16, 320, 321
 - strategic interdependence 304
- Olympic Games 221–2
- open access resources 444–5, 618
- operant conditioning 521–3, 618
- opportunity cost
 - affordability constraint 48, 54, 55, 69
 - consumption profiles 477–8
 - definition 37, 38, 618
 - education choices 495
 - exchange economy 383
 - labour/leisure time 462, 465, 610
 - marginal rate of substitution (MRS) 71
 - scarcity 49
- ordinary (Marshallian) demand
 - constant elasticity of substitution (CES)
 - functions 165–6, 173, 177
 - definition 139, 143, 156, 157, 618
 - demand curves 151
 - price changes 146, 147–8, 152
 - total effect 144, 145
- Ostrom, Elinor 612
- output expansion path 203, 205, 226
- overtime payments 464
- ownership 154

- parameter, definition 118, 618
- Pareto efficiency
 - concepts 372–3
 - definition 369, 392, 618
 - general equilibrium 398–400, 401, 402, 405, 406–7, 410
 - marginal rate of substitution (MRS) 369, 372, 375
 - public goods 439, 442, 443
 - Walrasian equilibrium 387–8
- Pareto improvement 372, 596, 618
- Pareto set (contract curves)
 - definition 369, 373, 392, 618
 - indifference curves 390, 391
 - two-person, two-factor, two-good model 401, 402–3
- partial derivatives (maths) 102, 103, 113
- partial equilibrium 369, 386
- participation constraint 293–4, 367, 586, 618
- patents 18, 281, 283
- payday loans 488
- payoffs 322, 323, 325, 332 *see also* game theory
- pensions 475, 529, 612
- Perfect Bayesian equilibrium 563, 565, 567, 585, 587, 589, 618
- perfect competition *see also* perfect market
 - assumptions 202
 - as benchmark 261
 - firm supply 233, 238–47, 248
 - general equilibrium 397, 401
 - marginal revenue 236, 247, 253
 - market equilibrium 249, 262, 610
 - market supply 259
 - monopolies 266–7, 283, 315
 - profit maximization 252–4
- perfect complements
 - constant elasticity of substitution 93, 156, 174, 177
 - definition 87, 88–9, 618
 - exchange economy 375, 376–7
 - income effect 150
 - marginal utility function 98, 99
 - market equilibrium 254–6
- perfect divisibility 185, 195, 618
- perfect information
 - definition 21, 24, 618
 - game theory 341
 - oligopolies 303
 - rational behaviour 449
- perfect market *see also* perfect competition
 - assumptions 12, 14–21, 34
 - definition 14, 15, 618
 - propositions 32
- perfect price discrimination 285–90, 301, 302, 618
- perfect substitutes
 - constant elasticity of substitution 93, 156, 164, 174, 177
 - definition 86–8, 618
 - exchange economy 377
 - substitution effect 150
- perfectly elastic demand 131, 618
- perfectly inelastic demand 129–30, 618
- permits, tradeable 427–9, 430
- perpetual bonds 474, 491–2, 497
- personal services 464–5
- petrol prices 10, 11–2, 134–5, 234–5, 523–4, 568
- piece rates 208
- Pigovian tax 423, 430, 618
- player 322, 618
- point elasticity 124, 175, 618
- pollination 413, 415, 429
- pollution 413, 420–1, 424, 426, 428–9, 432–3
- Porter, Michael 419
- positional consumption 455–7, 473, 618
- positive externalities 414–20, 429, 618
- Potteries, Staffordshire 418–9
- power functions 99, 131–3, 137
- power rule (differentiation) 99
- preference ordering *see also* social preferences
 - concepts 57–61
 - definition 57, 74, 619
 - house buying 469
 - preference map 67
 - public goods 440–2, 447
 - utility functions 76–7, 79–85, 92–3
- preferences *see also* weak preferences; well-behaved preferences
 - consumption profiles 475
 - definition 57, 618
 - education choices 496
 - exchange economy 368, 370–1, 375, 376, 381
 - general equilibrium 405

- lotteries 512–7
- properties 61–6
- satisficing 526
- status-quo bias 529
- present value 477, 484, 619
- price-cost margin
 - definition 276, 277, 619
 - monopolies 274–7, 283
- price discrimination
 - definition 285–6, 619
 - first degree 286–90, 301, 302
 - second degree 290–6, 301, 302
 - social benefits 264
 - third degree 296–301, 302
- price elasticity of demand
 - definition 129–30, 138, 619
 - learned responses 523–4
 - power functions 132–3
 - second-degree price discrimination 291–2, 294
 - third-degree price discrimination 297–8, 302
- price offer curves 118, 135–6, 137, 138, 382–4, 388, 390–1
- price offer path 135, 619
- price ratio
 - marginal rate of substitution (MRS) 165, 166, 379
 - marginal rate of technical substitution 196, 199, 203, 204
 - marginal rate of technical substitution (MRTS) 412
 - Pareto efficiency 401, 402
- price takers 238, 239, 261, 263, 619
- price theory 36, 181
- Pride and Prejudice* 547–53
- Prisoners' Dilemma game 322, 326, 329, 333–6, 341, 353–4
- private costs 422, 619
- private goods 368, 431, 432, 619
- private values 600, 619
- probability distributions
 - anchoring 531
 - auctions 600–1, 606
 - concepts 501–3
 - definition 500, 518, 619
 - loss aversion 511
 - prospect theory 539, 543
 - risk 507
- probability (maths) 359–60, 500–3, 515, 517, 518
- procedural (bounded) rationality 525–7, 543, 619
- product branding 520, 584, 588
- product differentiation *see also* competition; location
 - advertising 583–7, 588
 - bundling 295–6
 - definition 11
 - horizontal 568, 570, 575–80, 588–9, 617
 - minimum 569–70, 572
 - social benefits 21
 - spatial 570, 588
 - vertical 568, 570, 580–3, 584, 588, 589, 620
- product rule (differentiation) 99
- product uniformity 16–7, 619
- production *see also* factors of production
 - assumptions 201–2, 396, 407
 - definition 181, 619
 - efficiency 398–400, 411–2
 - externalities 413
 - general equilibrium 393–6, 412
 - profit maximization 400–2
 - two-person, two-factor, two-good model 396–407
- production functions
 - Cobb-Douglas utility 197, 255
 - concepts 189–96
 - constant elasticity of substitution (CES)
 - functions 190–1, 197, 198, 202–3, 212–4
 - costs of production 234
 - definition 181, 183, 185, 619
 - externalities 415, 416
 - general equilibrium 394, 396, 400, 407
 - homogeneity 190–1, 196–8, 202–3, 212, 214, 218, 245
 - household economic choices 467
 - long run 252, 397
 - monopolies 269, 271
 - returns to scale 214, 394
 - short run 224, 252
- production possibility frontier 294, 402–3, 406, 407, 619
- profit
 - definition 233, 619
 - maximization 235–8, 240–3, 246–8, 250–1, 252–4, 255–6, 259–60 *see also* reaction function
 - monopolies 266, 267–8, 271–4, 275–7, 278, 283
 - third-degree price discrimination 297–9
- profit functions
 - concepts 234–5, 236
 - cost functions 241, 242, 252–3
 - externalities 416–7
 - general equilibrium 400
 - oligopolies 305, 310–1, 316, 318
- profits 18, 233, 619
- proof by contradiction 24
- property rights 413, 429–30, 431, 432, 446
- prospect theory 537–42, 543, 619
- prospects 537, 619 *see also* lotteries
- public goods
 - broadcast signals 368, 431, 433–4
 - definition 368, 431–3, 447, 618, 619
 - free riding 431, 434–5, 442–4, 446, 447
 - management 440–6, 447
 - optimizing provision 435–9
- publishers 281–2
- punishment strategies 343
- pure strategy 362
- quality 451, 554–5, 558–61, 562, 566, 567
 - see also* characteristics; vertical differentiation
- quantity leader 315–6, 321, 331–2, 343, 351–3, 619 *see also* Stackelberg competition
- quotient rule (differentiation) 99
- random variables (maths) 361, 502, 619
- randomness 500, 619
- range (maths) 44
- rationality 449, 519–27 *see also* bias; loss aversion

- reaction function *see also* best-reply function
 consistent conjectures 307–8, 316
 Cournot-Nash equilibrium 344–5
 definition 305, 619
 mixed strategies 363–4
 price setting 318–9
 product differentiation 574
 production constraints 310–2, 321
 real income 52, 146–7, 148–9, 152, 157, 619
 redistribution of goods 368, 393
 reflexivity 62–3, 81, 85, 619
 rental agreements 182
 representativeness (heuristics) 534, 535, 543, 584, 619
 resource allocation *see also* choice
 behavioural economics 611, 614
 efficiency 169, 610
 equi-marginal principle 95–8, 114, 117, 610
 markets 34
 production functions 203–4, 220
 standard theory 5, 36, 39–44, 95, 114, 156
 two-part tariff 292–3
 restriction on entry 264, 265, 278, 279, 281, 426
 retirement planning 475, 529, 612
 returns to scale *see also* eventually diminishing returns
 to scale
 concepts 196–7
 constant elasticity of substitution 158
 cost functions 211–2, 213, 214–5, 217, 218
 definition 196, 619
 monopolies 267, 269, 278
 oligopolies 315
 perfect competition 261
 perfect market assumptions 16, 19–20
 production functions 213, 394
 profit maximization 240–3, 248
 Revenue Equivalence Theorem 604–8, 609
 revenue (total revenue) 233–4, 247, 619 *see also*
 marginal revenue
 revenues 18, 619
 reverse game theory 608
 Ricardian vice 223
 risk *see also* loss aversion; uncertainty
 concepts 498–500, 518
 expected utility 503–12
 probability 500–3, 517
 von Neumann-Morgenstern utility functions 512–7
 risk aversion 498, 507, 508–9, 515–6, 518, 536, 619
 risk loving 507, 518, 619
 risk neutrality 507, 518, 536, 619
 risk premium 498, 508–9, 510, 515, 619
 rivalrousness 432, 447, 619
 ‘Robinson Crusoe’ economy 394–6

 salience 532
 Salop model 577–9
 satiation 67, 72, 73, 75, 89, 92
 satisficing 525–7, 531, 532, 543, 619
 scalar rule (differentiation) 99
 scale of activity, unrestricted 16, 19
 scale of production 196–7, 619
 scarcity 37–9, 49, 52
 Schumpeter, Joseph 223
 sealed-bid auction 289, 592, 597–8, 602–4, 619

 second-degree price discrimination 290–6, 301, 302,
 619
 second-price auction 592, 619
 segregation (prospect theory) 538
 self-perception theory 530, 619
 separation (game theory) 563, 585–7, 589, 619
 service consumption 464–5
 share capital 201, 492
 short run
 costs 227–31, 245–7
 definition 222, 223–4, 619
 externalities 414–8
 labour input 224–5, 226–7, 251–2, 253
 market equilibrium 254–6, 259–61, 262
 market price 251
 plan deviation 224–5, 231
 production functions 224, 252
 supply function 245
 signal, definition 561, 619
 signalling
 advertising 584–5
 auctions 600
 education 613
 game theory 561–5, 566, 567, 588, 589
 Simon, Herbert 525, 612
 simple interest (maths) 487–8
 Skinner, B. F. 521–2
 Slutsky substitution 146–7, 148, 157, 177
 smallness, definition 249
 Smith, Adam 450
 smoking 499, 520–1
 social benefit payments 464, 465, 612
 social costs 413, 422–3, 430, 620
 social planner
 definition 410–1, 620
 dictatorship 441–2
 externalities 413, 416–8, 423–6, 429, 430
 open access resources 445
 product differentiation 579–80, 589
 public goods 431, 437
 purpose 412
 Vickrey-Clarke-Groves mechanism (VCG) 442–4
 social preferences 410, 412, 440–2, 447, 620
 social welfare function
 assumptions 368
 definition 393, 620
 externalities 413
 maximization 409, 410–1, 412
 public goods 440–2
 spatial differentiation 570, 588, 620
 Spence, Michael 611
 Spode, Josiah 419
 St Petersburg Paradox 504, 506
 Stackelberg competition 264, 329, 331, 342, 351–3,
 366 *see also* quantity leader
 Stag Hunt game 322, 329, 339–40, 341, 364–5, 435
 Standard Oil 278
 standard theory
 assumptions 75, 263
 elastic demand 265–6
 game theory 613
 money 153–5
 outline 39–44

- partial equilibrium 367, 368, 369, 386
- production 202
- rationality 519, 542
- resource allocation 36, 95, 114, 156
- utility function algebra 177
- validity 613–4
- state of technology
 - cost of production effect 18
 - definition 17, 620
 - willingness to pay (WTP) 18
- statistical experiments (maths) 359
- status-quo bias 519, 528–30, 542, 612
- statutory monopolies 265, 283 *see also* artificial monopolies
- strategic game of complete information 323–4, 340–1, 343–4, 347–53, 366, 547, 620
- strategic interdependence
 - definition 264, 303, 304, 620
 - market equilibrium 307
- strategy 323, 348–9, 620
- student discounts 296, 297–9, 300, 301
- student tuition fees 474–5, 493–4, 495
- sub-game 350, 620
- sub-game perfection
 - best-reply function 352–3
 - definition 343, 349–50, 366, 563, 620
 - product differentiation 568, 573
- sub-history (game theory) 350, 366, 620
- subsidies 280
- subsistence 111, 451–3, 471, 620
- substitutes 8
- substitution effect
 - conspicuous consumption 456–7, 473
 - constant elasticity of substitution (CES)
 - functions 171, 172, 173, 177
 - consumption profiles 480
 - definition 139, 144, 147, 157, 620
 - Hicksian (compensated) demand 144, **145**, 149
 - normal goods 151
 - perfect substitutes 150
 - rate of change 152
 - wage expansion path 463
- sum of functions rule (differentiation) 99
- summation (maths) 268–9, 270, 272–3
- sunk costs 4
- superior goods 121, 125–6, 620
- supply, excess *see* excess supply
- supply function 233, 243–5, 256
- supply shocks 225
- symmetric games (maths) 328, 329
- tangent (maths) 68, 69, 70
- tâtonnement* 387, 402
- taxation
 - externalities 423–4, 426, 430
 - income tax 52n, 368, 392
 - monopolies 288
 - Pigovian tax 423, 430, 618
 - redistribution of goods 368, 392, 393
- technical efficiency
 - definition 179, 189, 620
 - general equilibrium 398
 - resource allocation 169, 205, **207**, 218, 224, 232
- technological progress (advances in technology) 17, 615
- technology 16, 17–8, 181, 185–9, 197, 620
- technology continuum 193–4, 199
- technology of production 17, 196, 620
- telecommunications 280, 281
- temperature scales 77–8
- Thaler, Richard 612
- theory of choice 36, 612
- third-degree price discrimination 296–301, 302, 620
- time
 - income/leisure choice 460–5, 610
 - negative price of labour input 459
 - scarcity 38–9
- total effect
 - constant elasticity of substitution (CES)
 - functions 170–1
 - definition 144, 157, 620
 - Hicksian (compensated) demand 147–53
 - Marshallian (ordinary) demand 144, **145**
 - rate of change 153
- total product 190, 620
- trade
 - exchange economy 373–82, 388, **389**
 - restraint 278
- trade credit 201
- tradeable permits 427–9, 430
- trademarks 281
- Tragedy of the Commons* (Hardin) 444–5
- training institutions 420, 429
- transition costs 528
- transitivity 64–6, 81, 85, 512, 620
- transport choices 125–7, 135–6, 295–6, 297, 414, 431–2, 444
- trigger strategy 358
- tuition fees 474–5, 493–4, 495
- Tversky, A. 532, 534
- two-part tariff 292–4, 302, 620
- two-person, two-factor, two-good model
 - assumptions 396
 - Edgeworth box 396–7, 403
 - efficiency 398–400
 - Pareto set 401, 402–3
 - production and exchange 403–7
 - profit maximization 400–2
- uncertainty 246n, 496, 536, 543 *see also* loss aversion; risk
- uniform pricing 285, 299–301
- utilities supply 285, 292, 420
- utility *see also* marginal utility
 - characteristics 451
 - concept 76–9
 - definition 76, 77, 82, 96, 498, 620
 - factors of production 393–4, 403–4, 407, 412
 - happiness 153–4
 - leisure time 461, **462**, 610
 - maximization with income levels 118–27
 - maximization with price changes 127–9
 - money 153–5, 156
 - positional consumption 455
 - public goods 437–40
 - risk 503–12, 517, 518

- utility functions *see also* Cobb-Douglas utility
 - conspicuous consumption 457–8
 - constant elasticity of substitution (CES) 90–2, 93, 94, 106
 - consumption profiles 475, 480–1, 483, 485–7, 496–7
 - definition 94
 - exchange economy 375, 376, 379, **380**
 - general equilibrium 403–4, 406
 - homogeneity 105–7
 - income/leisure choice 461, **462**
 - indirect utility 154, 167–8, 177, 379
 - marginal 98–104
 - monotonically increasing transformation 104–5, 107, 513
 - perfect complements 87–8, 254–5
 - perfect substitutes 85–7
 - preference ordering 76–7, 79–85, 91–3
 - public goods 438
 - risk 513, 517
 - social context 450
 - von Neumann-Morgenstern 498, 512–7, 536
- utility possibility frontier 409–10, 412, 620
- valuation (prospect theory) 539–40
- variable costs 227
- variable, definition 118, 620
- Veblen effects 454, 455, 472
- vertical differentiation 568, 570, 580–3, 584, 588, 589, 620
- Vickrey-Clarke-Groves mechanism (VCG) 442–4, 446, 447, 620
- Vickrey (second-price) auction 591, 592, 593–6, 598, 600–1, 604, 607–8, 609
- voluntary exchange 14, 22, 269
- voluntary work 39n
- von Neumann-Morgenstern utility functions 498, 512–7, 536
- wage expansion path 463
- wages 183–4, 254, 464–5, 494, 613 *see also* costs of production; labour input
- Walras' Law 387, 394, 414
- Walrasian equilibrium 381–7, 391, 392, 394, 410, 620
- warranties 562, 566
- weak preferences 57, 58–9, 63, 74–5, 620
- (weakly) preferred set 58, 620
- wealth expansion path 482
- wealth, expected 498, 503, 504–7, 508, 509, 518, 542 *see also* utility
- Wedgwood, Josiah 419
- weighting function (prospect theory) 539, 540–2, 543
- welfare economics theorems 387–8
- welfare loss of monopoly
 - causes 268, 274, **279**
 - concepts 269–71
 - definition 283, 620
 - perfect price discrimination 287, 302
 - regulation 280
- welfare-maximizing price 280
- well-behaved preferences
 - assumptions 67–8, 75, 76, 85
 - constant elasticity of substitution (CES) functions 161–2, 175, 176
 - consumption profiles 475
 - definition 56, 61, 620
 - law of demand 151
 - marginal rate of substitution (MRS) 68–71
 - most-preferred, affordable bundle 67–8
 - Pareto efficiency 369
 - utility functions 83–4
- well-being *see* happiness
- willingness to accept (WTA)
 - asymmetric information 545
 - definition 14, 22, 34, 233, 620
 - endowment effect 528–9
 - externalities 428
 - individual (firm) supply 29–30, 34
 - market price 29–30
 - monopolies 269, 272
 - product differentiation 11
 - quality 558–60
- willingness to pay (WTP)
 - auctions 593–5, 598, 600, 601, 602–3, 605, 609
 - basic examples 9, 10, 25
 - definition 14, 22, 34, 620
 - endowment effect 528–9
 - English (ascending) auction 288–9
 - externalities 428
 - individual demand 26–8, 34
 - monopolies 269, 271–2, 274
 - price discrimination 286–7, 288, 290, 301, 302
 - public goods 436–7, 447
 - quality 554–5, 556, 558–60, 567
 - state of technology 18
 - third-degree price discrimination 296
- yield management 297
- zero derivative (maths) 214
- zero-sum game 332, 333, 620