Brief contents

chapter

1

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

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

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.

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 *demanded*. 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.
>
> **Excess demand** A situation in which potential sellers offer less 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).

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.
> (a) 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.
> (b) 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: (i) very experienced shoppers, who have used the market for several years; and (ii) newly arrived in the city, and visiting for the first time?
> (c) How easy might it be for stallholders to give their stalls unique identities? How might experienced shoppers distinguish between stalls?
> (d) Suppose that the market is owned by the city council, which rents space to stallholders. What extent of variation in rents might there be?
> (e) 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 800 g loaf and that they use the same technology. Presented with a loaf from each bakery, consumers would not be able to distinguish between them.

(a) 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?

(b) 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?

(c) 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?

(d) 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.

(a) 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?

(b) Were one café to reduce its price by £0.10, what would you expect to happen to sales of coffee in the two cafés?

(c) 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.

(d) 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:

(a) How might we define the market?

(b) 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?

(c) 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?

(d) 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?

(e) 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?

(f) 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.

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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.

(a) To what extent might these salons face competition from businesses in other towns?

(b) Thinking of the measures of willingness to pay and willingness to accept, what might be the effects of allowing product differentiation on choice?

(c) How important do you consider repeat business will be to the success of a salon?

(d) Suppose that the price charged in a salon increases by 10%. What effect might this have on the business of the salon?

(e) Suppose that all five salons cut their prices by 10%. What effect might this have on their business?

(f) 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.

(a) 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?

(b) 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?

(c) 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?

(d) 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 identity 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.

Visit the companion website at **www.palgrave.com/mochrie** to access further teaching and learning materials, including lecturer slides and a testbank, as well as guideline answers and student MCQs.

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