

Section II

Understanding markets

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Chapter 2

Consumers in the market place

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Learning outcomes

By the end of this chapter you should understand:



Economic Theory

- ◆ Demand curves
- ◆ Factors leading to a change in demand
- ◆ The price elasticity of demand
- ◆ Cross price and income elasticity



Business Application

- ◆ How measures of elasticity can lead to improved management of total revenue
- ◆ How an appreciation of consumer surplus can lead to enhanced pricing strategies

Demand theory at a glance

The issue

Setting the price for a product is crucial for the product's and company's success. But what is the best price for a particular product?

The understanding

As a product becomes more expensive, consumers will begin to demand less. In some markets consumers will be very sensitive to a change in price. In others they may not react at all. This reaction is measured using elasticity. An examination of demand theory and the concept of elasticity will develop these ideas more fully.

The usefulness

If the price of the product can be made to rise at a quicker rate than the decline in demand, then total revenue will rise. Therefore, by understanding how consumers respond to price changes we can optimize the price charged.

2.1 Business problem: what is the best price?

If, as suggested in Box 2.1, pricing is so important, what is the best price? The best price is determined by the firm's objectives. The following provides a common list of objectives for a firm:

- 1 Maximize the amount of profit made by the firm
- 2 Maximize the market share for the firm's product
- 3 Maximize the firm's total revenues

Box 2.1 Pricing and profits

Choosing the wrong pricing strategy can be a costly mistake

Published 4 June 2003, Wharton Business School

According to Raju and Zhang from Wharton Business School, research suggests that pricing strategies can have a huge influence on company profits. They cite a study of more than 2400 companies by McKinsey in 1992 showing the impact that various decisions would have on the bottom line: a 1% reduction in fixed costs improves profitability by 2.3%; a 1% increase in sales volume will result in a 3.3% increase in profit; a 1% reduction in variable costs will prompt a 7.8% rise in profit; but a 1% hike in pricing can boost profitability by 11%.

'In recent years, business people have paid attention to many things that can influence their companies' success,' Zhang says. 'They've looked at organizational behavior, downsizing, benchmarking and reengineering, and companies have done a lot to cut costs. But they haven't spent as much time thinking about the best possible pricing strategies. I think the picture painted by McKinsey is still pretty much true today. There's a lot of room for profit improvement through better pricing strategies.'

These are all commercial objectives. Firms could also adopt non-commercial objectives, such as reducing environmental impact or being a socially responsible employer. But for the purpose of this chapter we will concentrate on the three objectives listed above. It is generally not possible for a firm to choose more than one of these objectives. For example, in order to maximize market share, a firm might reasonably be expected to reduce its prices in order to attract more customers. But by dropping its prices, the firm could be sacrificing profit. Therefore, we will assume that a firm seeks to maximize one of our three objectives¹ and the best price can be defined as the one that enables the firm to meet its preferred objective.

How are prices set? Take the case of supermarkets. When walking around a supermarket have you as a consumer ever set the price for a product? The answer is probably not. Now compare the case of supermarkets with buying a house, or a car. When we purchase a house, or a car we might make an opening offer to the vendor as part of a negotiation over the price. At the supermarket, by contrast, we would never consider negotiating over a trolley full of shopping; nor would we negotiate in many other types of shop, such as a clothing retailer. Admittedly, we may have an indirect effect on prices by refusing to buy a product that we consider too expensive but in the main it appears that supermarkets, retailers and perhaps even the producers of the products are controlling the prices that we have to pay.

As business students it is important to recognize the position of product suppliers. This is because control is essential when seeking to set the best price and achieve the firm's objectives. But herein lies the business problem: what is the best price? To illustrate the problem consider the following: very high sales can be generated with low prices, while very high prices will tend to generate low sales. But which option is preferable? As an example, we can show that these alternative scenarios can be similar. If a low price of £5 generates 10 sales, then total revenue is £50; if a high price of £10 generates only 5 sales, then total revenue is also £50. Given that these options are identical, a businessperson would really like to know if there is a pricing option of around £8 selling to 8 customers, making a total revenue of £64.

Whether £8 is the best price, or indeed whether £8.25 is even better, is a difficult question to address. When a national supermarket chain is selling beer, soap powder, or even oven chips by the hundreds of thousands, a small change in the price can generate huge changes in total revenue. By the end of this chapter you will understand how you assist the supermarkets in finding the best price. Every time you pass through the till at the supermarket, scanner data are stored and matched with promotional offers such as 'Buy One Get One Free'. This is then modelled and used to address strategic price changes.

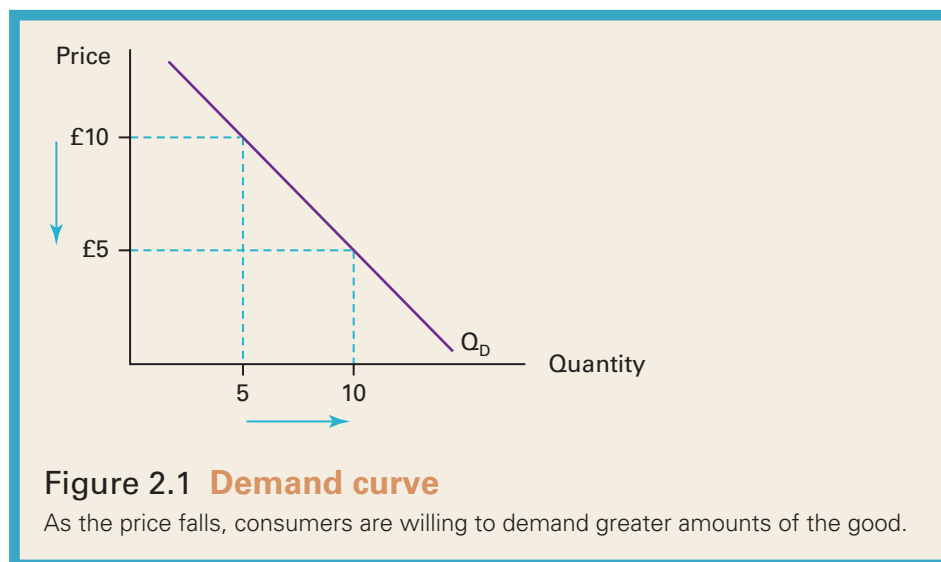
It is clearly important to recognize that firms will price items relative to their cost structures. If a firm wishes to make a profit, then the price must be greater than costs. If the firm wishes to maximize market share, while not making a loss, then the price cannot fall below the cost of making the product. While recognizing the importance of costs, in this chapter we will simply focus on the interaction between pricing and consumers' willingness to buy a particular product. Through Chapters 3, 4 and 5 we will develop a fuller understanding of pricing decisions by recognizing both firms' cost structures and consumers' willingness to purchase. In this chapter we begin this analysis by developing a clear understanding of demand theory.

2.2 Introducing demand curves

The **demand curve** illustrates the relationship between price and quantity demanded of a particular product.

In attempting to understand consumer behaviour, economists use a very simple construct known as the **demand curve**.

Figure 2.1 is an example of a demand curve, where the line Q_D represents quantity demanded. The slope of the demand curve Q_D is negative. This simply depicts the rather obvious argument that as prices fall, more of a product will be demanded by consumers. Using our previous example, at a price of £10 the demand curve indicates that consumers across the market are willing to demand 5 units in total. But if the company dropped the price to £5 then it might expect to sell 10 units.



The negative relationship between price and quantity demanded is often exploited by businesses. For example, Figure 2.1 could be an example of a 'buy one get one free' offer. Firms use such offers because they are sometimes reluctant to reduce the price of their product. This is because overt price reductions could lead to a retaliatory price war from rivals. Lower prices may also provide a signal to the market that the product is of an inferior quality. A 'buy one get one free' offer allows the published price to stay the same, but the effective price for consumers is halved. Under such an offer, consumers are more willing to demand the product and, not surprisingly, companies use such promotions to boost sales and gain market share.

Furthermore, we all like end-of-season sales at our favourite clothing retailers. But sales simply represent an attempt by the retailer to shift stock that we as consumers would not buy at the higher price and are, therefore, another example of the demand curve in action.

In Box 2.2 we have a business example of price cutting to attract demand. Even though consumers may prefer branded Cola, a price reduction by a rival brand will increase consumers' willingness to demand.

Box 2.2 Pricing and demand

Rival Big Cola is a big pain for Coke in Mexico

Adapted from an article by Marla Dickerson, New York Newsday, 2 January 2006

Big Cola has grabbed 5 per cent of Mexico's \$6.5 billion soft-drink trade. And it has forced titans Coke and PepsiCo Inc. to lower prices in a country where they have long reaped some of their fattest profits.

Big Cola has done it without big-budget advertising, fancy trucks or an extensive product line. The secret: lots of cola for a little money. A 3.3-liter container of its flagship Big Cola brand sells for about \$1.12, and sometimes as little as 86 cents on special.

The low-price strategy is attracting budget-conscious consumers such as Carlos Lopez. The construction worker was recently in a convenience store buying a monster bottle of Big Cola to share with his buddies back at the job site. Lopez said some of them prefer the Real Thing, and he admitted a lifelong fondness for Coke. But when it's his turn to buy a round, economics prevail. 'It's cheap,' he said of Big Cola. 'And it tastes good as long as it's cold.'

2.3 Factors influencing demand

The demand curve shows a negative relationship between price and quantity demanded. But the willingness to buy a product is influenced by more factors than simply price. Therefore, in order to capture these alternative factors, economists make reference to four broad categories:

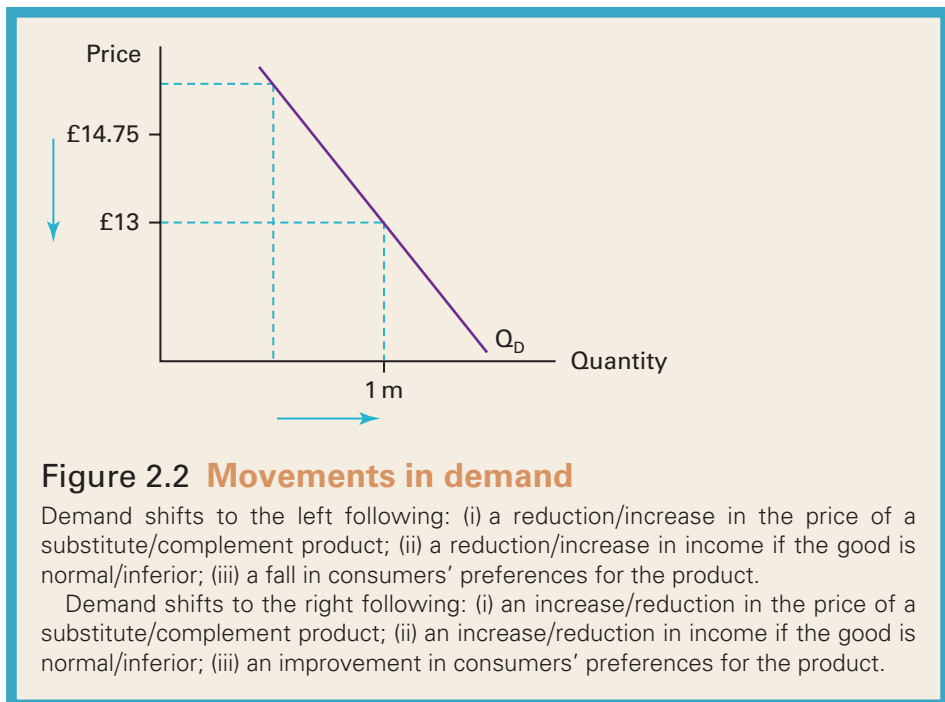
- 1 Price of substitutes and complements
- 2 Consumer income
- 3 Tastes and preferences
- 4 Price expectations

Price of substitutes and complements

Substitutes are rival products; for example, a BMW car is a substitute for a Mercedes, or a bottle of wine from France is a substitute for a bottle from Australia.

Substitutes are competing products in the market place, seeking to gain customers from their rivals. So, if French wine producers decided to reduce the price of their wine, they would hope to gain some of the Australian wine producers' customers. As a result, the Australians sell less wine for the same price. This is depicted in Figure 2.2 with the demand curve for Australian wine moving in to the left to Q_{D2} and Australian wine consumption decreasing from 1000 to 500 units at a constant price of £5 per bottle. Clearly the opposite will also be true. If the French increased their prices, then they might expect to lose customers to the Australians. This would be depicted as rightward shift in the demand curve from Q_{D0} to Q_{D1} .

In Box 2.3 we have the example of supermarkets embarking on price promotions to lure customers away from their rivals. Those who are successful, reap the benefits of increased demand and increased market share.



➔ Box 2.3 Price strategies

Asda chief threatens new price war in move to catch up Tesco

Adapted from an article by Julia Finch, the Guardian, 14 December 2005

Andy Bond, Asda's chief executive, threatened a new price war yesterday in an effort to close the sales gap with Tesco. He set out a plan to fight back, with lower prices. 'Asda has always been about being the lowest-priced retail brand and I'm going to be more aggressive next year', Mr Bond said.

The price war between Tesco and Asda has been fierce in recent years, with food prices being cut at 1%–2% a year. Asda has consistently topped surveys to find the cheapest grocery prices, but in recent months both Tesco and J Sainsbury have beaten it. Asda's market share, meanwhile, has fallen to 16.6% – nearly half that of Tesco – and it is expected to lose its position as Britain's no. 2 grocer to Sainsbury's in the coming months.

Complements are products that are purchased jointly. Beer and kebabs would be a youthful and modern example; another would be cars and petrol.

Complements are products that are demanded together. For example, if you buy a car, then you will have to buy petrol. This, therefore, means that the demand for the two products is related. If cars become cheaper, then more cars will be demanded. As a consequence, more petrol will also be demanded. If Figure 2.2 represents demand for petrol, then a reduction in the price of cars will lead to increased demand for cars. This increased demand for cars will lead to a higher demand for petrol. The demand curve for petrol will shift to the right from Q_{D0} to Q_{D1} , with more petrol being demanded at the existing price of £5 per gallon.

Normal goods are demanded more when consumer income increases and less when income falls.

Inferior goods are demanded more when income levels fall and demanded less when income levels rise.

Consumer income

In understanding the effect of income on demand we need to distinguish between **normal** and **inferior goods**.

In terms of Figure 2.2, when income increases, the demand curve for Australian wine shifts right to Q_{D1} and more is demanded at every possible price. However, during a recession, when incomes are likely to fall, consumers will cut back on wine and the demand curve shifts left to Q_{D2} .

Inferior goods tend to be those characterized as cheaper brands – products that we stop purchasing once our income rises and we move to more normal type of goods. Think about the things you buy at the supermarket as a poor indebted student and the things your parents buy as significant income earners. You will tend to be buying inferior types of goods, such as supermarkets' own label items. Your parents will be buying normal types of goods, such as branded lines in bread, alcohol and frozen foods. In terms of Figure 2.2, as income rises the demand curve for an inferior good would shift left to Q_{D2} . When income falls the demand curve for an inferior good would shift right to Q_{D1} . In brief, the behaviour of the demand curve for normal goods is opposite to that of inferior goods.

Tastes and preferences

Tastes and preferences reflect consumers' attitudes towards particular products. Over time these tastes and preferences are likely to change. Fashion is an obvious example: what might be popular this year will be out of fashion next year. Technological development might be another. Mobile phones capable of sending images and connecting to the Internet are becoming increasingly popular. We can survive quite well without such technology but, through advertising, companies try to influence our tastes and preferences for such advanced capabilities.

In order to represent a positive improvement in tastes and preference for a product, in Figure 2.2 the demand curve would shift right to Q_{D1} , with more products being sold at any given price, while a reduction in consumer backing for a product would lead to a left shift in the demand curve, with less being sold at any given price. For example, in recent times flat-screen, high-definition televisions have begun to replace cathode-ray televisions, reflecting changed tastes and preferences for flat-screen technologies and, therefore, lower demand at all prices.

The role of advertising

Advertising can play at least one of two roles in demand theory. First, it provides consumers with information about products. Advertising informs consumers that new products have arrived on the market, that a product has new features, or that a product is being offered at a lower price. In this way advertising plays a very valuable informational role for firms and for consumers. Demand for products increases simply because consumers are informed about the nature and availability of the product. Therefore, when advertising plays an informational role, the demand curve for the product shifts out to Q_{D1} as more consumers become informed about the existence of the product.

There is, however, another role for advertising. If adverts are simply about informing consumers about the existence of products, why are they played repeatedly over very long periods of time? Moreover, why do product suppliers hire well-known celebrities to appear in their adverts? How many adverts do you see on the television, or in the press, that provide information about the product's characteristics, price or availability?

Advertising is also about trying to change consumers' tastes and preferences. We all know that mobile phones are capable of sending pictures and video, so why would we be interested in knowing that celebrities use such technology? We all know that a Swiss watch looks good and can keep reasonable time, so why would we be interested in knowing which celebrities wear such watches? One possible answer is that the product provider is not simply selling a product. Instead they are selling you a desirable lifestyle. We do buy technologically advanced mobile phones because they are useful; but we also buy such phones because we believe that they say something positive about who we are. By emphasizing these less tangible aspects of a product, it is possible to build additional differentiation into the product. Two mobile phones might provide the same functions, but only one is used by a world-class footballer. Accordingly, advertising is not simply about informing consumers about what they *can* buy; it is also about informing them about what they *should* buy. Whether advertising is providing information, or developing consumers' tastes and preferences, the overriding aim is to shift the demand curve from Q_{D0} to Q_{D1} , while at the same time shifting the competitors' demand curves from Q_{D0} to Q_{D2} .

Price expectations are beliefs about how prices in the future will differ from prices today.

Price expectations

If you expect prices to fall in the future, then it may be wise to wait and delay your purchase. For example, recently launched computers, televisions and DVD systems are often sold in the market at premium prices. Within three to six months, newer models are brought out and the old versions are then sold at lower prices. If you do not have a taste or preference for cutting edge technology, you can cut back on consumption today in the expectation that prices will fall in the future. In terms of our demand curves, if we expect prices to fall in the future, then demand today will be reduced, shifting back to Q_{D2} . But the demand curve for three to six months' time will shift right to Q_{D1} .

The opposite can also be true. It is possible to believe that in the future prices will rise. Property may be more expensive in the future, share prices might increase, or oil will be more expensive in six months' time. Therefore, if you expect prices to rise in the future, you are likely to bring your consumption forward and purchase now. In terms of our demand curves, your demand for now shifts out to Q_{D1} , but your demand in the future shifts back to Q_{D2} .

We now understand that the demand for a product is influenced by (i) its own price, (ii) the price of substitutes and complements, (iii) the level of consumer income, (iv) consumers' tastes and preferences, and (v) price expectations. We are now in a position to introduce the **law of demand**.

Accordingly, as long as (ii) the price of substitutes and complements, (iii) the level of consumer income, (iv) consumers' tastes and preferences, and (v) price expectations remain constant, there must be a negative relationship between price and quantity demanded.

Do higher prices attract higher demand?

The negative relationship between price and quantity demanded can cause students and business managers problems. For example, designer clothes and perfumes would not be purchased if they were cheap. So, does a positive relationship exist between price and willingness to demand luxury items? While it remains an appealing idea, the answer to this question is still no, since all products have a negative demand curve. This is because even when you are very rich you still have a budget constraint.

The **law of demand** states that, *ceteris paribus*, as the price of a product falls, more will be demanded (*Ceteris paribus* means all other things being equal).

Assume you are fortunate to have an annual expense account of £500 000. Your designer clothes cost £300 000 per year, champagne is another £100 000; and the private jet another £100 000. If your favourite designer suddenly increases their prices by £50 000, you are faced with a choice. If you continue to buy the same quantity of clothes, they will now cost £350 000, and you will have to cut back on the champagne and the jet. Alternatively, you could cut back on your clothes and maintain the same amount of champagne and the private jet. However, most probably you will reduce some of your demand for designer clothes, perhaps buying fewer clothes at the higher price of £325 000, as opposed to the £350 000 it would cost to buy the same quantity as last year. The extra £25 000 might come from reducing your flights and the amount of champagne that you drink.

It is important to understand, from the example above that higher prices for one product limit how much money you can spend on *all* goods and services that you like to consume. The demand curve for designer clothes should have a negative slope, because you will decrease the quantity of clothes purchased in order to retain consumption of the champagne and jet travel.

Therefore, for luxury items, how do we explain the positive relationship between price and quantity demanded? Some consumers prefer products that have an element of exclusivity, and a high price not only ensures exclusivity, but also signals that the product is special. A low price would not create the same image. Therefore, the high price attracts particular consumers into the market. This leads to the demand curve shifting out to the right in Figure 2.2 and means that the positive relationship between price and quantity is associated with a change in tastes and preferences. As such, the positive relationship of price and demand is best described as a shift of the demand curve, rather than a movement along the curve.

These points are picked up in Figure 2.3, with product providers such as Louis Vuitton keen to avoid their product being sold at discount prices. The high price of the product and the distribution of the product through licensed clothing retailers is deliberately managed in a way to promote the product's high-quality image. Consumers' tastes and preferences have been developed by Louis Vuitton to the extent that consumers expect Louis Vuitton bags to be expensive and more exclusive than cheaper alternatives. Louis Vuitton will be concerned to protect the high price image of its product, fearful that a low price would have a detrimental effect on consumers' tastes and preferences. The demand curve for Levi jeans will shift to the left, reducing the number of bags sold.

In Figure 2.3, Q_{D1} represents the demand for Louis Vuitton handbags among consumers who have a strong taste and preference for expensive and exclusive bags. At a price of £1000 demand is Q_D high price. Q_{D2} is the demand for Louis Vuitton among consumers who do not have a strong taste and preference for expensive and exclusive bags. We can see that at a price of £1000 none of these consumers will buy – the line from £1000 does not touch Q_{D2} . However, at a discounted price of £100 consumers represented by Q_{D2} are willing to buy Louis Vuitton. The demand curves Q_{D1} and Q_{D2} both have a negative slope. However, if we were to focus mistakenly on points A and B, and draw a line connecting the two points, then we might be led to believe that increases in price lead to increases in demand. This would be a mistake, because it is the differing tastes and preferences for cheap and exclusive brands that leads to the shift between the points A and B.

However, the real problem facing the purveyors of luxury goods around the world, is that income levels have risen such that individuals of modest incomes can indulge in conspicuous consumption, see box 2.4. This has led to Bobos in Paradise, or the super rich wearing drab clothes and driving beaten-up cars, pursuing conspicuous-inconspicuous consumption.

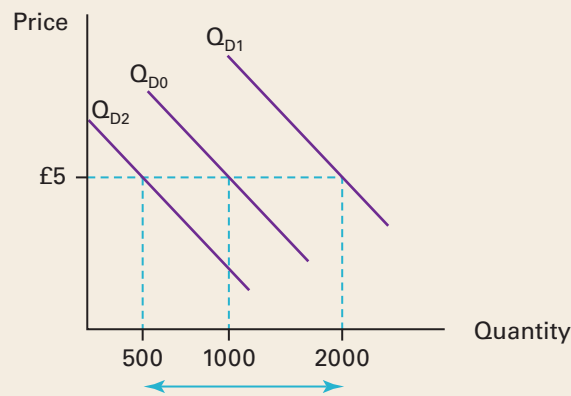


Figure 2.3 Demand for Louis Vuitton

Q_{D1} and Q_{D2} are the demand curves for Louis Vuitton bags. Under Q_{D1} stores are not allowed to sell Louis Vuitton bags at discount prices, while under Q_{D2} stores are able to sell Louis Vuitton bags at a discounted price. Consumers with a taste and preference for expensive and exclusive bags are willing to buy bags at £45. But once discounting by stores makes Louis Vuitton bags cheap and not exclusive, then consumers are less willing to buy bags. Louis Vuitton bags at £1000. Demand shifts from Q_{D1} to Q_{D2} and fewer bags are purchased. The reason we sometimes think there is a positive relationship between price and willingness to demand is because we only focus on points A and B. If we joined up these two points, we would see a positive relationship between price and quantity demanded. But this is a mistake, as we really need to focus on the shifts in the demand curves reflecting a change in tastes and preferences.

➔ Box 2.4 Managing prices

Inconspicuous consumption

Adapted from an article in The Economist, December 20 2005

Now that luxury has gone mass market, how are the super-rich to flaunt their wealth? The recently reopened Louis Vuitton store on the Champs Elysées is a deliberate exercise in democratic luxury. On its new, opulent art deco terraces, elegant French ladies of a certain age – the epitome of the traditional consumer of luxury fashion – rub padded shoulders with jeans-and-tee-shirt sporting rap singers and a gaggle of British working-class hen-weekenders.

It seems likely that Louis Vuitton's still-exquisite handbags, shoes and other indulgences are not as exclusive as before. Products and services that were once the preserve of a very wealthy few are increasingly becoming accessible, if not to everyone, then certainly to millions of people around the world. This maybe upsetting to those super-rich folk who have long been able to afford luxury, and may in one crucial respect even regard it as a necessity.

As Thorstein Veblen noted over a century ago in *The Theory of the Leisure Class* – the book in which he coined the phrase 'conspicuous consumption' – spending lavishly on expensive but essentially wasteful goods and services is 'evidence of wealth' and the 'failure to consume in due quantity and quality becomes

a mark of inferiority and demerit'. But in the 21st century, 'being a conspicuous consumer is getting harder and harder'. What does a billionaire have to do to get noticed nowadays?

Being a millionaire, for instance, is becoming commonplace. In 2004 there were 8.3 million households worldwide with assets of at least \$1 million, up by 7 per cent on a year earlier, according to the latest annual survey by Merrill Lynch and Capgemini. The newly wealthy are often desperate to affirm their status by conspicuously consuming the favoured brands of the already rich. In developed countries this can be seen, in its extreme form, in the rise of 'Bling' – jewellery, diamonds and other luxuries sported initially by rappers – and Britain's unsophisticated Burberry-loving 'chavs'. (Burberry is considered unusually successful at tapping a broader market. But even it now understands that not every new customer is desirable: in January it withdrew its distinctive checked baseball caps because of their popularity with chavs.)

The number of luxury buyers in the developed world is also being swelled by two other trends. First, consumers are increasingly adopting a 'trading up, trading down' shopping strategy. Many traditional mid-market shoppers are abandoning middle-of-the-range products for a mix of lots of extremely cheap goods and a few genuine luxuries that they would once have thought out of their price league.

Demand for luxury is also soaring from emerging economies such as Russia, India, Brazil and China. Antoine Colonna, an analyst at Merrill Lynch, estimates that last year Chinese consumers already accounted for 11% of the worldwide revenues of luxury-goods firms, with most of their buying done outside mainland China. He forecasts that, by 2014, they will have overtaken both American and Japanese consumers, becoming the world's leading luxury shoppers, yielding 24% of global revenues.

For the already rich, strategies such as splashing out on ever bigger houses, longer yachts or getting special treatment from luxury-goods firms does not contribute much marginal conspicuousness.

But, perhaps the true symbol of exalted status in the era of mass luxury is conspicuous non-consumption. This is not just the growing tendency of the very rich to dress scruffily and drive beaten-up cars, as described by David Brooks in 'Bobos in Paradise'. It is showing that you have more money than you know how to spend.

2.4 Measuring the responsiveness of demand

You have been introduced to the demand curve and the factors that cause demand to shift. However, for the businessperson it is not enough to know that the demand for a product is determined by (i) its own price, (ii) the price of substitutes and complements, (iii) the level of consumer income, (iv) consumers' tastes and preferences, and (v) expectations regarding future prices. As a person in the market place making real pricing decisions, the businessperson needs to know the impact of price changes on the quantity demanded.

Elasticity is a measure of the responsiveness of demand to a change in price.

Figure 2.4 provides an illustration of **elasticity**. In Figure 2.4a a small change in the price leads to a much bigger change in the quantity demanded. But in Figure 2.4b a very large change in the price leads to a small change in the quantity demanded. So, we might say that in Figure 2.4a demand is responsive to a change in price, while in Figure 2.4b demand is not very responsive to a change in price. While the demand curve in 2.4a is flatter than the demand curve in 2.4b, the slope of the demand curve is not the only determinant of how responsive demand is to a change in price. We will return to this point shortly. But first let us consider why some products have demand that is responsive to a change in price while others do not.

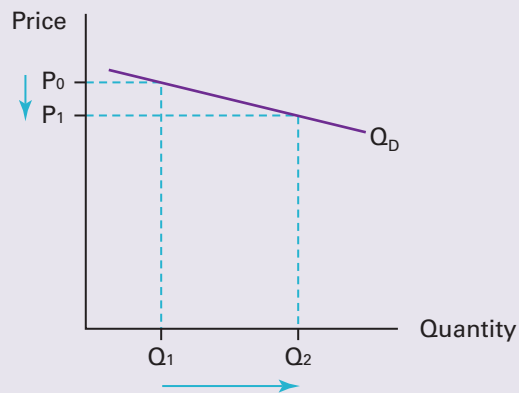


Figure 2.4a **A small change in the price leads to a large change in demand.**

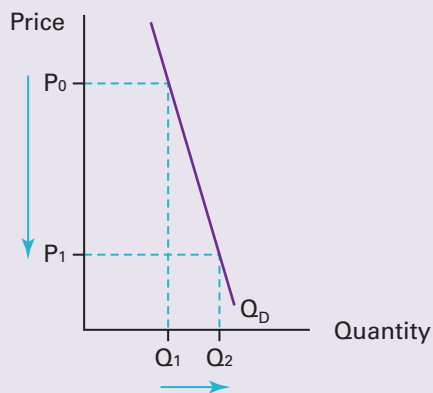


Figure 2.4b **A large change in the price leads to a small change in demand.**

Figure 2.4 **Price and quantity changes**

Determinants of elasticity

The elasticity of a product is determined by a number of factors:

- 1 Number of substitutes
- 2 Time
- 3 Definition of the market

Substitutes

As the number of substitutes increases, the more elastic will be demand. For example, if a product has no substitutes and the supplier decides to increase its prices, then consumers cannot switch to a cheaper alternative. Therefore, when the price increases for this product, demand will only fall by a small amount. In contrast, when a product has a very large number of substitutes, its price elasticity will be very high. If the price of the product increases, consumers will very quickly switch to the cheaper alternatives. Cigarettes – and more importantly nicotine as an addictive drug – have few, if any, substitutes. Therefore, if the price of cigarettes increases, then few smokers will quit cigarettes. Alternatively, in the market for mobile telecommunications, with many competing suppliers, if one provider reduces its prices, then there will be a rapid change in demand, with consumers switching to the cheapest provider.

Time

Time is also important, as it is likely to influence the development and introduction of substitutes. Initially, new products or markets will only have a small number of substitutes. Only if these products are successful will new entrants come into the market and begin to compete. Therefore, in the early periods of a new market demand is likely to be inelastic, but in the long term, as more products enter the market, demand is likely to become more elastic. For example, the launch of alcoholic drinks for the youth market, mixing alcoholic drinks with soft drinks, started with a small number of product offerings. As sales in the market have grown, the number of competing products has also increased.

Market definition

Market definitions are also important when measuring elasticity. The demand for beer is relatively unresponsive to a change in price. As the price of beer increases, consumers still continue to buy beer, because they perhaps view wine as a poor alternative. In contrast, the demand for a particular brand of beer is likely to be price responsive. This is because all the separate beer brands are competitive substitutes. So, if one brand becomes more expensive it is likely that drinkers will switch to the cheaper alternatives.

Measuring elasticity

Mathematically, economists can measure elasticity, or the responsiveness of demand to a change in price, using the following formulas:

Formula	Elasticity
<i>One</i>	$\varepsilon = \frac{\text{Percentage change in quantity demanded}}{\text{Percentage change in price}}$
	=
<i>Two</i>	$\frac{\text{Change in quantity demanded}}{\text{Change in price}} \times \frac{\text{Price}}{\text{Quantity demanded}}$

The value of ε for elasticity will lie between zero and infinity ($0 < \varepsilon < \infty$).² This is a very large number range, so economists break the range down into regions that they can describe and utilize. Using the first formula, each of these regions is described in Table 2.1.

Table 2.1 Important elasticity measures

	Percentage change in price	Percentage change in demand	Numerical calculations	Elasticity value	Description
1	10	0	0 10	$e = 0$	Perfectly inelastic
2	10	5	5 10	$e < 1$	Inelastic demand
3	10	10	10 10	$e = 1$	Unit elasticity
4	10	20	20 10	$e > 1$	Elastic demand
5	10	Infinitely large		$e = \infty$	Perfectly elastic

Where elasticity $e < 1$ demand is described as **inelastic**, or a change in the price will lead to a proportionately smaller change in the quantity demanded. When $e = 1$ demand has **unit elasticity**, or demand is equally responsive to a change in price. Where $e > 1$ demand is described as **elastic**, or demand is responsive to a change in price. **Perfectly elastic demand** exists when $e = \infty$. In other words, demand is very responsive to a change in price.

We will begin with an easy example. If the price of cigarettes increased by 10 per cent, how many smokers would cut back on the number of cigarettes smoked? Many smokers would continue smoking. In an extreme situation a 10 per cent change in the price of cigarettes could lead to no change in the quantity demanded. (In reality this would not happen, but the example provides a reasonable description of a theoretical extreme.)

In economic terms demand is said to be perfectly inelastic when $e = 0$; that is, demand does not respond to a change in price. This is detailed in the first row of Table 2.1.

Clearly *perfectly inelastic demand* is an extreme situation. So in the second row of Table 2.1 we consider the situation where a 10 per cent change in the price leads to a 5 per cent change in demand.

The demand for Coca-Cola may well be **inelastic**. If Coke increased its prices by 10 per cent we might expect it to lose a small, rather than large number of customers. So, demand is not very responsive to a change in price.

In row 3 we have the situation where a 10 per cent change in the price leads to a 10 per cent change in the quantity demanded – **unit elasticity**.

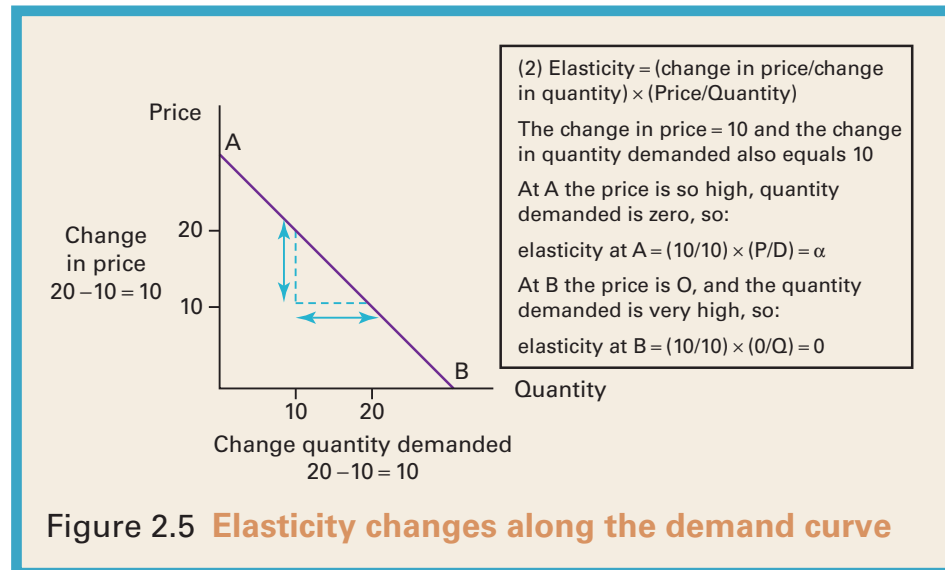
In row 4 we consider the situation where a 10 per cent change in the price leads to a much bigger change in quantity demanded, in this case 20 per cent, resulting in **elastic demand**.

Consider the price of mobile phone contracts; nearly all competing networks offer very similar menus and prices. One of the reasons for this is because demand is reasonably elastic. If one company raised its prices, then over time many of its subscribers would switch to another network. Therefore, similar prices are offered because each network recognizes that demand is responsive to price differences.

Finally in row 5 we consider **perfectly elastic demand**. In this case the change in price is 10 per cent and, in response, demand changes by a very large amount. The London financial markets come close to a situation of perfectly elastic demand. If the market price of shares in Shell is £10 then you can sell all of your holdings at £10. But if you offered to sell at £10.01 you would not sell a single share, as potential buyers would move to the many other sellers offering to sell at £10.

Elasticity and the slope of the demand curve

We mentioned above that the slope of the demand curve is only an indication of how elastic demand is. In fact we can now show that the elasticity of demand changes all the way along a particular demand curve. We will do this by using the second formula for elasticity (see Figure 2.5).



During a basic maths course you will have been told that to measure the slope of a line, you need to draw a triangle next to the line. The slope, or gradient, of the line is then the change in the vertical distance divided by the change in the horizontal distance. In our case the gradient is the change in price (the vertical) divided by the change in quantity demanded (the horizontal). For our second formula we need the 'inverse' of the slope, that is we need the change in quantity demanded (horizontal) divided by the change in price (vertical). But what we can say is that the slope of the line is constant, so the inverse of the slope is also constant. We have measured the slope and the inverse in the middle of the line and it is equal to $10/10 = 1$. In fact, in our example, because the slope is constant, it does not matter where we measure the slope – it is always $10/10 = 1$.

We can now calculate the elasticity of demand at two special points, A and B. At A the demand line just touches the vertical axis. The price is so high that demand is zero. At B the demand line just touches the horizontal axis. The price is zero and demand is very high.

Using our second formula for elasticity, at A the elasticity is:

$$(10/10) \times (\text{price}/0) = \text{infinity} = \infty$$

Because at A the demand is zero, the elasticity of demand must be infinite. We know that this means that demand is perfectly elastic.

The elasticity at B is:

$$(10/10) \times (\text{quantity demanded}/0) = 0$$

Because at B the price is zero, the elasticity of demand must be zero. We know that this means that demand is perfectly inelastic.

Therefore, all the way along the demand curve the elasticity changes from being perfectly elastic to perfectly inelastic, even though the slope has remained constant. This

is because the elasticity of demand is influenced by the slope of the demand line; *and* by the ratio of price and quantity demanded. When the price is very high, a small reduction in the price will generate a proportionately bigger change in demand. But when the price is very low, a small change will not generate a proportionately bigger change in demand.

In simple terms, consumers react to price reductions when a product is very expensive. But they are less motivated by price reductions when a product is already very cheap. Therefore, demand is more elastic at higher prices than at lower ones.

2.5 Income and cross price elasticity

Before considering the application of this knowledge it is also worth introducing you to two related measures: **income elasticity** and **cross price elasticity**.

Income elasticity measures the responsiveness of demand to a change in income. **Cross price elasticity** measures the responsiveness of demand to a change in the price of a substitute or complement.

$$\text{Income elasticity} = Y_{\epsilon} = \frac{\text{Percentage change in demand}}{\text{Percentage change in income}}$$

For normal goods, income elasticity is above zero because as consumers' income rises, say during an economic boom, more normal types of goods will be produced. If $Y_{\epsilon} < 1$, the product is described as income inelastic, or demand will grow at a slower rate than income, while if $Y_{\epsilon} > 1$ demand is income elastic, or demand will grow at a faster rate than income. The recent UK and US housing booms are a reflection of positive income elasticity, with consumers being more willing to spend money on property as their incomes increased within a prosperous economy.

For inferior goods, income elasticity lies between zero and minus infinity because as incomes rise, consumers buy fewer inferior goods. This time demand is income inelastic if Y_{ϵ} lies between zero and -1 , or is income elastic if Y_{ϵ} is smaller than -1 , e.g. -5 .

$$\text{Cross price elasticity} = X_{Y\epsilon} = \frac{\text{Percentage change in demand of product X}}{\text{Percentage change in the price of product Y}}$$

If X and Y are substitutes or rivals then, as the price of Y increases, the demand for X will increase, so $X_{Y\epsilon}$ for substitutes lies between zero and plus infinity. If X and Y are complements, then as the price of Y becomes more expensive, less X will also be purchased; $X_{Y\epsilon}$ must lie between zero and minus infinity.

In Box 2.6 we have examples of price, cross price and income elasticity for bus travel. With a price elasticity of demand equal to 0.1, demand is price inelastic. A drop in prices would not generate many more bus travellers. A cross price elasticity of +0.3 indicates that buses and cars are substitutes and, since the value is less than 1, the relationship is inelastic. Therefore, even if cars became more expensive few drivers would opt for buses instead. The income elasticity of -2.4 suggests that bus travel is an inferior good and highly income elastic. Therefore, even a small rise in income will cause bus travellers to cut their demand for bus travel, and perhaps move to car travel.



Box 2.6 Elasticity measures for bus travel

Price elasticity	(-) 0.1
Cross price elasticity (with cars)	+0.3
Income elasticity	-2.4

2.6 Business application: Pricing Strategies I – exploiting elasticities

Finding the best price was this chapter's business problem. After introducing demand theory and the concept of elasticity we are now able to return to this particular problem.

Cost-plus pricing

A rather simple approach to pricing is to simply take the costs of producing the product and add a mark-up, such as 30 per cent. This might cover some stray, unaccounted-for costs and also the required profit margin. The benefit of this approach is in its computational simplicity only requiring a basic idea of costs and a grasp of a desirable profit margin. It may also appear to be fair. Who would begrudge a firm asking for a 30 per cent mark-up? After all, they are taking a risk and they should be able to generate a decent financial return.

Unfortunately, while appealing, cost-plus pricing neglects almost everything we have introduced you to in this chapter. That is, it fails to take account of consumers' willingness to demand. There is no guarantee that consumers will be willing to buy your product when the mark-up is 30 per cent. Alternatively, 30 per cent may not be a sufficiently high enough mark-up. Consumers may exhibit a very keen preference for your product and a low elasticity of demand. While 30 per cent appears fair, you might be able to gain good sales volumes with a mark-up of 50–100 per cent. It therefore appears that we need to also consider demand theory when setting prices.

'Buy one get one free' – discounting or price experiment?

In simple terms the need to find the best price stems from a broader need to generate revenues. At the beginning of this chapter in the business problem example it was suggested that at a price of £5 we might sell 10 units, making £50 of revenue. But at a price of £8 we might sell 8 units, making a total revenue of £64. This looks like a better option. But how can we be sure that moving from £5 to £8 is a good idea? We might have ended up selling only 6 units, making a total revenue of only £48 (see Table 2.2).

Table 2.2 **Total revenue**

Price	Quantity	Total Revenue
£5	10	£50
£8	8	£64
£8	6	£48

Price elasticity measures the response of demand to a change in price. We face two outcomes when changing the price: demand falls to 8 or 6 units. Falling from 10 to 8 units is a small response to a change in price or, in our new terminology, demand is inelastic. But when demand falls to 6 units the response is much bigger and demand can be described as elastic. But what happens to total revenues? When demand is inelastic, total

revenues have increased to £64. But when demand is price elastic, total revenues have fallen to £48. We can expand upon these simple ideas using Figure 2.6.

Total revenue is price multiplied by number of units sold.

In Figure 2.6a we have a price elastic demand curve. So, at a price of P_0 we can expect to sell Q_0 units. Therefore, **total revenue** is represented by the rectangle defined by the P_0 and Q_0 .

If we drop the price to P_1 then sales increase to Q_1 and total revenue is now equal to the new rectangle defined by P_1 and Q_1 .

The impact of a price reduction on total revenue is the difference in size between the two rectangles. By selling at a lower price we lose some total revenue. For example, if we were selling at £10 and now we are only asking for £8, we are losing £2 per unit. But by

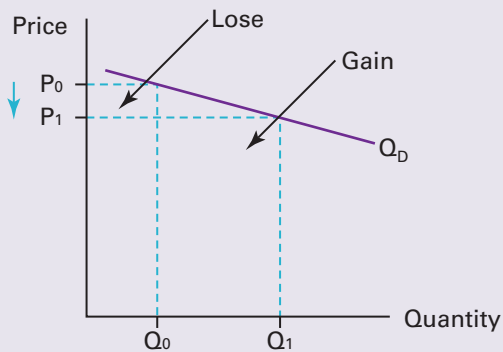


Figure 2.6a **Change in total revenue when demand is elastic**

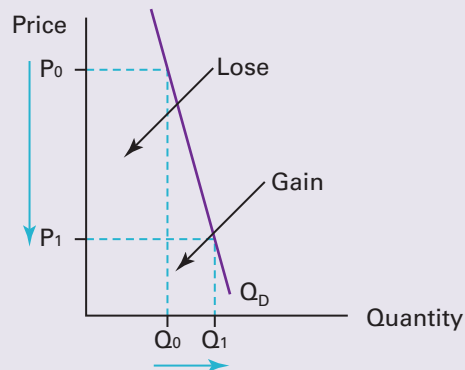


Figure 2.6b **Change in total revenue when demand is inelastic**

Figure 2.6 **Price changes, total revenue and elasticity**

reducing the price we will also gain some total revenue by selling to more customers – in this example Q_1 as opposed to Q_0 customers. Hence, when demand is price elastic, selling at a lower price will boost total revenues. In contrast, if we examine the case of inelastic demand in Figure 2.6b we see that reducing the price leads to a drop in total revenues.

We now have economic guidance for business. If demand is elastic then dropping prices raises total revenues; but if demand is inelastic, prices should be increased in order to increase total revenues.

If we return to our business problem, the best price occurs when price elasticity equals 1, which is exactly in between the elastic and inelastic region. With unit elasticity a 10 per cent increase in the price leads to a 10 per cent change in quantity demanded. Total revenue does not change; the maximum has been found.

Admittedly, firms may not always target a price elasticity equal to 1. They may not have revenue maximization as their objective. They may wish to maximize market share or profits. Changing the price involves the development of new pricing plans and the communication of price changes to retailers of the product. As a result, change can be costly and not offset by improvements in revenue. Change can also represent a risk. Competitors could react to your price changes. A reduction in your price could lead to a price war, which you may not find attractive. Furthermore, you may not fully understand the price elasticity of demand for your product. If you consider the demand for your product to be elastic, you should think about reducing your price. But if you have got it wrong and demand is inelastic, your revenues will fall, not rise. It is, therefore, important to understand how you might measure your elasticity of demand.

Elastic or inelastic?

Cigarettes were used as an example of inelastic demand and mobile phone networks were used as an example of elastic demand. Cigarettes have few substitutes: if all cigarettes become expensive, smokers will not switch to another type of vice, as there are few sources of nicotine. If one telephone network increases its prices, however, mobile phone users can switch to the cheaper networks. It is the level of competition for a product that influences its elasticity.

The level of competition provides an indication of how elastic demand is. However, if we wish to target unit elasticity we will need a measure of how far our current pricing is from this best price. To find the best price we need to gather data that will enable the demand curve for our product to be plotted, or mathematically modelled.

Once we have a demand curve, we can see the relationship between price and quantity and measure the elasticity of demand at various prices. Unfortunately the data required for a demand curve is difficult to find. Ideally an experiment should occur where the price of a product is changed and the effect on demand is noted, but product suppliers are not keen to change the price of the product to see what happens to the demand. Indeed, if they raise the price they are likely to lose customers to a rival brand. Recognizing this problem market researchers can make use of promotional exercises. For example, a 'buy one get one free' offer is basically a 50 per cent discount in the market. A 'buy two get the third free' offer is a 33 per cent discount. When you buy a product at the supermarket, so-called 'scanner data' is created. Therefore, for any given period of time the supermarket knows how much soap powder was sold and what discounts were on offer. Market research companies make it their business to buy scanner data from a large selection of supermarkets across the country. They then use this to advise companies on pricing, because by using the data on sales and promotional discounts they can begin to estimate

the elasticity of demand. For each price at which the product is sold, the market researchers also note down how many units of the product are sold at the tills. They then plot this as in Figure 2.7. The plot shows a negative relationship between price and quantity demanded. To smooth out this relationship the researchers then use a computer to calculate the trend line, as in Figure 2.8. The trend line is in fact the demand curve that we have been using throughout this chapter.

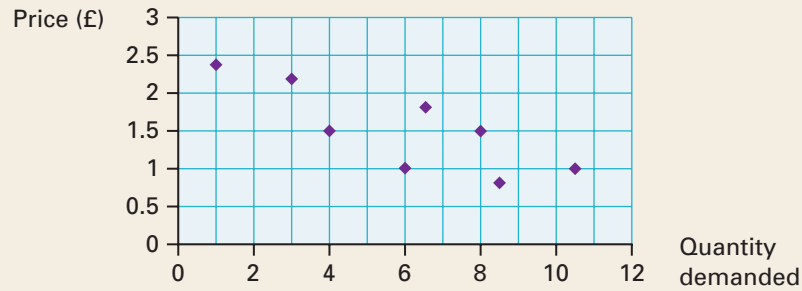


Figure 2.7 Plot of demand and price

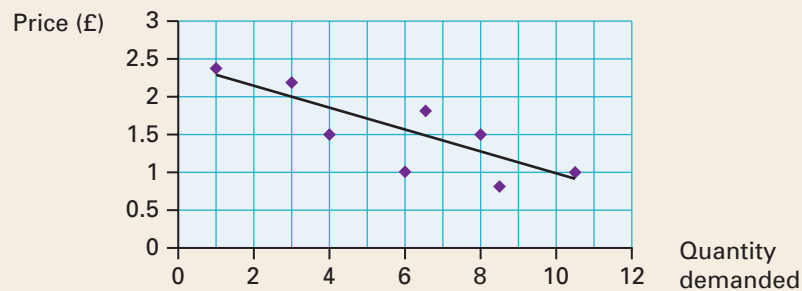


Figure 2.8 Adding in the trend line

By using mathematical techniques known as econometrics, the trend line can be analysed and manipulated to provide an estimate of the price elasticity of demand. Knowing that unit elasticity is optimal, product managers can then make an informed decision about whether to raise or lower prices. In your working lives you are unlikely ever to calculate the elasticity of demand for a product, but being able to understand the concept will be very important (see Box 2.5).

Product life cycle and pricing

The preceding discussion analysing elasticity and total revenue for the most part neglects the time-varying nature of competition and elasticity. When a new and innovative product emerges onto the market, it faces very few competitors. At launch the Sony Portable Play Station, in as much as it was able to play movies, music, access the Internet and play games, faced limited competition from Nintendo's GameBoy. However, this is unlikely to last: Nintendo and other electronics manufacturers will enter the market with

Box 2.5 Up Close with Stelios Haji-Ioannous

Adapted from an article by Rupert Steiner, In Edge, the Institute of Leadership and Management, April, 2005

Mr easyJet's no-frills approach in business has carved a niche in hawking low cost, functional services, which has created him an 'easy' fortune in the process. Stelios is quick to acknowledge his debt to education. I specifically remember the economics class where we studied the simple concept of elasticity of demand – customers who want the flexibility of leaving it later to pay for products pay more than those who can commit earlier.

'While it was not a ping moment, some years later when I started the airline and had to come up with a pricing strategy, I knew it made more sense to vary the price rather than fix it. That one lesson was crucial to easyJet's success. When I started easyJet, airlines flew at 70% capacity – now we run at 85%. We have lifted occupancy by 15% which, multiplied by 600 flights a day with exactly the same costs, is a big boost to our margins.'

improved models. Motorola and its Razr mobile phone radically redirected the design and development of mobile phones. Cilitbang is a revolutionary cleaning product. While, in the automobile industry Renault were the first to convert a Mégane into a Scénic and create the MPV segment of the market. Citroën soon followed with a Picasso, Ford have a C Max and Toyota have their Verso range. Successful innovation spawns imitation and aggressive competition as the market grows.

Eventually consumers will become tired of old designs and concepts. Newer models and ideas will emerge and sales will track the latest fashion. Demand for Sony's PSP, Motorola's Razr and MPV's will fall, competitors will leave the market and competition will become less severe. These arguments are captured in the concept of a product life cycle, which is illustrated in Figure 2.9.

Successful products go through four phases of the product life cycle: introduction, growth, maturity and decline. (Unsuccessful products never pass introduction). At each stage of the product life cycle the number of competitors is different. This leads to differing substitutability and differing elasticities of demand for the products.

Pricing at launch

In the introduction stage an innovative product is likely to be unique and face few if any competitors. For early adopters who wish to be seen with the latest technology, demand will be price inelastic. Firms could, therefore, seek to price high in order to capture the high demand from this set of consumers.

Pricing during growth

In the growth phase, companies who have witnessed the success of the innovative product also join the market. This increases competition and substitutability and increases the elasticity of demand. Recognizing the inverse relationship between price and consumers' willingness to demand, firms can seek to gain a dominant position by cutting prices in the hope of gaining market share. Under this strategy firms are trading a revenue-maximizing strategy for a sales-maximizing strategy. This could be temporary: maximizing sales and market coverage in the short run and winning the hearts and minds of customers, only to then exploit this commercial position in the long run with a strategy which maximizes revenues.

Pricing during maturity

The ferocity of competition is most acute during the mature phase of the cycle, sales are at a peak and the market can be supplied by the largest number of competitors. The potential for a high degree of price elasticity in the mature phase of the cycle provides a basic rationale for the sales-maximization strategy during the growth phase. Gain market share, cut out competition, or face the consequences of merciless price competition in the mature phase of the cycle. High price elasticity means little control over pricing, as competitive pressures force the price down to the lowest possible level.

Pricing during decline

In the decline phase of the market consumers will begin to leave the market. In response some firms will also exit, seeking better commercial opportunities elsewhere. Competition will fall and the degree of price sensitivity among consumers will diminish. Firms remaining in the market will see the elasticity of demand begin to become more inelastic, and an element of price stability and hopefully price rises might occur.

Therefore, throughout the product life cycle the pricing strategy has to be reactive to the changing competitive nature of the market.

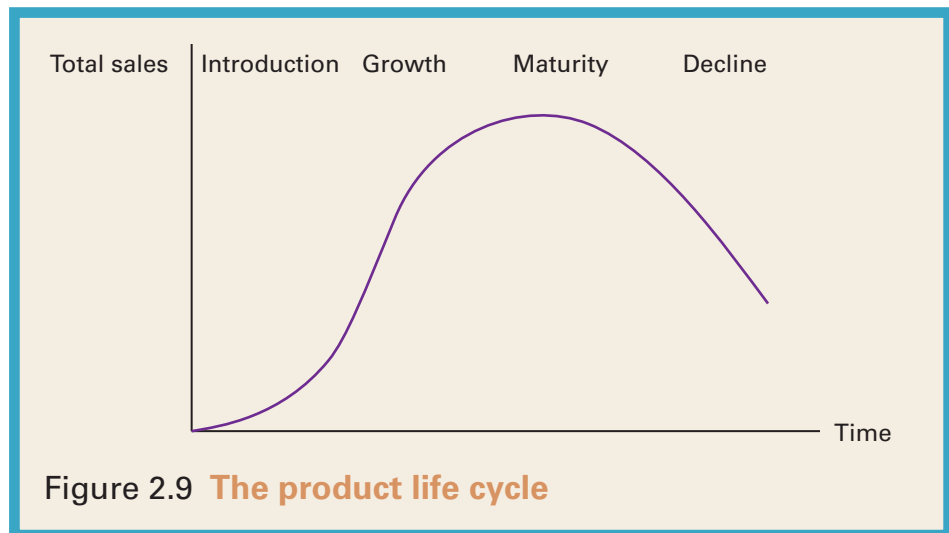


Figure 2.9 The product life cycle

2.7 Business application: Pricing Strategies II – extracting consumer surplus

Consumer surplus – the island of lost profits

Consumer surplus is the difference between the price you are charged for a product and the maximum price that you would have been willing to pay.

Here is a true but curious thought: when you buy a product you are nearly always willing to pay *more* for it. This is the concept of **consumer surplus**.

For example, you may have been willing to pay £750 for a flight to Australia, but you manage to find a flight for £500. Your consumer surplus is £250.

Figure 2.10 illustrates the idea of consumer surplus using the demand curve. You are charged £500, but you are willing to pay £750. Indeed, in the market there may be some consumers who would be willing to pay even more than you. The entire amount of consumer surplus in the market is the area under the demand line down to the price

charged of £500. This area represents the amount each consumer would be willing to pay in excess of the price charged.

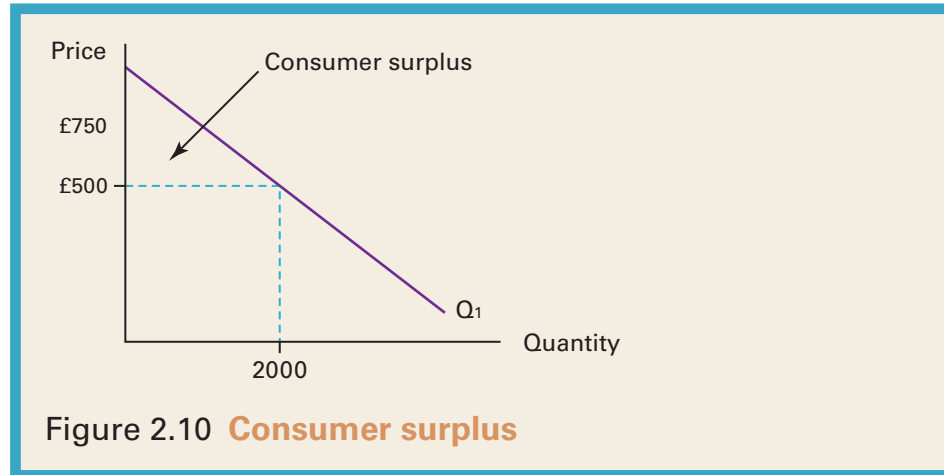


Figure 2.10 **Consumer surplus**

Consumer surplus represents a benefit for consumers, but clearly for a firm it represents missed profits, because you were willing to pay £750 and were only charged £500. This is not good. So, as a businessperson how do you discover a consumer's true willingness to pay and charge them accordingly?

Price discrimination is the act of charging different prices to different consumers for an identical good or service.

Price Discrimination

In order for a firm to extract the consumer surplus it needs to undertake price discrimination, the act of charging different consumers different prices for the same good. For price discrimination to be successful three conditions must exist. First the firm must have some control over its prices: it therefore cannot face a perfectly elastic demand line. Economists refer to this as having some degree of market power in setting prices. Second, the firm must be capable of identifying different groups of consumers who are willing to pay different prices. Third, resale of the good or service must be prohibited. If it isn't, a consumer who buys at a low price can then sell to a consumer who is willing to buy at a high price. The profits from price discrimination then flow to the consumer, rather than the firm. Economists identify first, second and third degree price discrimination.

First-degree price discrimination

Under first-degree price discrimination each consumer is charged exactly what they are willing to pay for the good or service. This is unlikely to work in practice because it would involve each customer freely admitting to the top price that they would be willing to pay. For example, an airline might line up all of its passengers and ask them to write on a large card the price they would be willing to pay to fly on the aircraft. The passengers would then be admitted onto the aircraft in price order. Highest first, lowest last. Those who bid too low may not fly if the aircraft is full. However, passengers might not write a truthful price and why should they? In addition, the entire process is very costly in terms of time and administration to carry out.

First-degree price discrimination is therefore seen to be difficult to carry out in practice. Instead, a seller look for cues or signals of a consumer's willingness to pay. For example, a builder, plumber, or electrician might charge for work based on the type of car

parked on the drive. Car sales people are trained to look at items worn by a potential buyer, such as the watch, the coat, clothes and even areas where they live. These all provide reasonable, but imperfect, signals of someone's ability to pay and perhaps willingness to pay. Finally, there is the use of auctions, where each potential buyer is forced to bid for an item. In bidding each buyer is communicating their willingness to pay. The highest bidder wins when the price is above every other bidders' willingness to pay – that is, every other bidder has no consumer surplus. However, auctions are costly to organize, only one sale at a time occurs and there is no guarantee that bidders will attend.

Second-degree price discrimination

Under second degree price discrimination, consumers are charged according to the number of units they buy. For example, gas, electricity and telephones tend to be offered under two part tariffs. The first part is a fixed element to cover the cost of the infrastructure. The second part covers the cost of using additional units of electricity gas, etc. If the fixed element is £10 per month and each unit costs £0.1, then a user of 100 units a month is charged $£10 + (100 \times £0.1) = £20$. Taking account of the fixed element the cost per unit is $£20/100 = £0.2$. Now consider someone who uses 200 units: their monthly bill is $£10 + (200 \times £0.1) = £30$, which equates to a cost per unit of $£30/200 = £0.15$. The higher user gains a discount of 25 per cent. But how does this extract the consumer surplus? The listed unit cost of £0.1 per unit is the price charged to all consumers. The fixed price element is set to extract the consumer surplus. Because the consumer surplus is not constant across all consumers, the fixed element can also be varied across consumers through the provision of pricing menus. High users with a presumably high willingness to pay are offered a high fixed access price, but a low cost per unit. Low users with a presumably low willingness to pay select a low fixed access price but a high cost per unit. These pricing strategies are also used beyond the utility industry – for example, membership of gyms and golf clubs often includes a fixed and variable element.

Third-degree price discrimination

Finally, we have third degree price discrimination where each consumer is charged a different price. This tends to occur where firms can identify different market segments for a similar product or service. In the case of airlines, young students are fairly flexible when it comes to flying around the world. If the plane is full on Monday, they can fly on Tuesday. In fact, demand by young travellers is elastic, as different days of travel provide substitutes. A business traveller is more likely to have very specific needs. The overseas meeting will take place on a specific date and they will need to be back in the UK very quickly to attend more meetings. These travellers are much less sensitive to price and so exhibit price-inelastic demand.

Therefore, rather than offering each traveller the same product at the same price, you can segment the market. Offer two different products at different prices. Cheap economy tickets with no frills to the student; and expensive business-class tickets to the businessperson, with comfortable seats, good food and access to airport lounges.

Premium television channels use the same idea. Instead of paying one fee for all digital channels, consumers are offered a menu. The base price includes the standard assortment of channels. The sport and movie channels are additional extras. Consumers that value sport highly will pay the higher price.

This is known as de-bundling the product. If the product is composed of many different parts, in our case various television channels, the offering is not sold as one bundle; rather, it is sold as a number of separate bundles, each with an individual price.

This stripping-out of valued products from the standard range enables companies to deal with the problem of consumer surplus by targeting customers with the combination of products that they value the most.

Box 2.6 Sony targets big boys with all-singing and dancing games gadget

Adapted from an article by David Derbyshire, The Telegraph, 31 August 2005.

Priced at £180, the Sony PSP is being promoted as more than just a games machine. Unlike its nearest rival, the Nintendo DS, it plays full-length movies, downloads and plays songs and video, and surfs the Internet.

Unlike previous consoles, such as the Playstation, the PSP will not be a loss leader for Sony. In the past, the company has sold consoles at less than cost price, knowing that it could recoup money from the strictly licensed games made by third-party companies. But in order to make its new format for games and films – UMD – popular, it has loosened its controls over the format and put up the price of the player. By Christmas, there will be about 50. Future software includes a conversion kit to turn it into a satellite navigation device, and TalkMan – a Star Trek-style voice recognition programme that translates a phrase into another language

In Box 2.6 Sony PSP is a handheld console, with add-ons: movies, games, music, downloads, satellite navigation. It is a de-bundled product and the pricing strategy reflects this. Previously, non-portable consoles have been sold at a loss, reflecting the competitive and therefore price-elastic nature of the market between Sony, Microsoft and Nintendo. Once a consumer buys a Sony console they are then forced to buy licenced product for the machine, demand is now inelastic and so the price increases. So, why change the strategy for the PSP? First, the console is innovative and unique in playing movies while on the move. The PSP therefore faces inelastic demand and Sony quite correctly have exploited this by selling at a premium. Second, by loosening control over the UMD format, it can promote increased supply of movies for its console, those promoting competition and price elasticity for add-ons. This should help adopters of the PSP. The important point for business managers is that Sony have recognized that the demand characteristics for the PSP should be different from the stand-alone PlayStation and the means of raising revenue and extracting consumer surplus have changed.

Summary

- 1 A key characteristic of modern economic life is that companies set prices. With companies in such a powerful position, what is the optimal price to set for a product?
- 2 The demand curve shows consumers' willingness to demand a product at various prices. As the price increases consumers are less willing to demand the product.
- 3 Demand is also seen to be influenced by the price of substitutes and complements.
- 4 Substitutes are rivals; complements are products that are purchased together. As a substitute becomes more expensive, demand for the rival product will increase. As the price of a complement rises, demand for the remaining product will fall.

- 5 Rising income will lead to an increase in demand for normal goods. But it will lead to a fall in demand for inferior goods.
- 6 The tastes and preferences of consumers change over time. As goods become popular, consumers move into the market. As products become unfashionable, consumers leave the market and demand falls.
- 7 Price elasticity, income elasticity and cross price elasticity measures how much demand changes when price, income or the price of a substitute or complement changes.
- 8 If the percentage change in demand is greater than the percentage change in price, then demand is said to be elastic. If the percentage change in demand is less than the percentage change in price, demand is said to be inelastic.
- 9 Companies use the concept of elasticity when setting prices. If demand is elastic, reducing prices will lead to a rise in total revenue. When demand is inelastic, raising prices will lead to an increase in total revenue.
- 10 Companies measure the elasticity of demand by analysing mathematically what happens to sales when they offer promotional discounts in the market.
- 11 Consumer surplus is the difference between the price charged and how much a consumer would have been willing to pay. This difference represents lost profits.
- 12 It is possible to capture some consumer surplus by de-bundling product offerings. Consumers can be offered a base package but extras are offered at much higher prices.

Learning checklist

You should now be able to:

- ◆ Draw a demand curve for a good or service
- ◆ Understand how changes in income, the price of substitutes and complements, tastes and price expectations shift the demand curve left or right
- ◆ Explain the concept of price elasticity of demand and understand the distinction between elastic and inelastic demand
- ◆ Explain how total revenue can be improved by understanding how elastic demand is for a good or service
- ◆ Explain how firms can develop strategies to access consumer surplus

Questions

- 1 List five products that you think are price elastic. List five products that you think are price inelastic.
- 2 Is consumer surplus greater under elastic or inelastic demand?
- 3 How would you advise a company to go about changing the elasticity of demand for one of its products?

- 4 Using ideas relating to income elasticity, how would you build a portfolio or collection of products that would perform well when the economy was growing during a boom and contracting during a recession?

Exercises

- 1 True or False?
- An increase in income will cause an increase in demand for all goods.
 - Two goods are complements if an increase in the price of X results in an increase in demand for Y.
 - Price elasticity measures the responsiveness of the quantity demanded to the change in the price.
 - The price elasticity is constant along the length of a demand line.
 - If a car costs £15 000 and a consumer is willing to pay up to £18 000, then the consumer surplus is £3000.
 - If a product is price inelastic, revenues will rise following an increase in the price.
- 2 a) Plot the following demand curve and associated total revenue curve.

Price £	10	8	6	4	2
Demand	1	2	3	4	5
Total Revenue					
Elasticity					

Calculate the elasticity at each price.

What is the change in total revenue if the firm moves from a price of £8 to £4?

Which price maximizes total revenue?

What is the elasticity when revenue is maximized?

- b) As a result of rising income demand increases at all prices by 5 units.
Explain whether this good is normal or inferior
Is the new demand line more or less elastic than the original? Why do you think this should be the case?
- 3 You have been hired by Louis Vuitton to advise them on their pricing strategy. Your brief is to cover each of the following:
- The benefit of raising their existing prices.
 - The potential of broadening the brands appeal through a gradual reduction in prices
 - The potential benefits of launching a new brand called 'Louis'. Who should this product be sold to and at what price level?

Notes

- We will examine the objectives of a firm more fully in Chapters 5 and 7.
- You will shortly understand that elasticity must lie between zero and minus infinity. This is because if we increase prices then quantity demanded will decrease. So a negative change in demand will be divided by a positive change in the price. So the elasticity measure will always be negative. Economists ignore the negative sign and simply look at the numerical value for elasticity.