

depends on the price elasticity of demand.

Price elasticity and profit

Price elasticity also has an effect on **profit**. Profit is calculated as sales revenue minus costs. Costs are likely to change with sales. The more that is produced, the higher the costs.

If demand is price inelastic, a rise in price will lead to lower sales but increased sales revenue as explained earlier. But the lower sales will mean lower costs. So profits will increase, not just from higher sales revenue but also from lower costs.

If demand is price elastic, an increase in sales revenue can be achieved by lowering price and raising sales. But higher sales also mean higher costs. In this situation, higher profits will only occur if the increase in sales revenue is greater than the increase in costs.

Factors affecting price elasticity of demand

The value of price elasticity of demand for a product is mainly determined by the ease with which customers can switch to other similar **SUBSTITUTE PRODUCTS**. A number of factors is likely to determine this.

Time Price elasticity of demand tends to fall the longer the time period. This is mainly because consumers and businesses are more likely to turn to substitutes in the long term. For example, fuel oil is highly price inelastic in the short term. If the price of petrol goes up 20 per cent in a week, the fall in quantity demanded is likely to be only a few per cent. This is because car owners have to use their cars to get to work or to go shopping. But over a ten year period, car owners will tend to buy more fuel-efficient cars. Businesses with boilers using fuel oil may replace these with gas boilers. Homeowners with oil-fired central heating systems might install more insulation in their houses to cut running costs or change to gas boilers. As a result, demand for oil in the long run is likely to be price elastic.

Competition for the same product Some businesses face highly price elastic demand for their products. This is because they are in very competitive markets, where their product is either identical (i.e. are perfect substitutes) or little different from those produced by other businesses. Farmers, for example, when selling wheat or potatoes are in this position. If they push their prices above the market price, they won't be able to sell their crop. Customers will simply buy elsewhere at the lower market price.

Branding Some products are **branded**. The stronger the branding, the less substitutes are acceptable to customers. For example, many buyers of Kellogg's corn flakes do not see own label brands, such as Tesco or Asda cornflakes, as good substitutes for Kelloggs. They will often pay 50 per cent more to buy Kelloggs rather than another brand. Successful branding therefore reduces the price elasticity of demand for the product.

Product types vs the product of an individual business Most products are made and sold by a number of different businesses.

Petrol, for example, is processed and sold by companies such as Shell, Esso and Total. The major supermarkets also sell petrol which they have bought from independent refiners. The demand for petrol is price inelastic in the short term. But the demand for Shell petrol or Esso petrol is price elastic. This is because petrol has no real substitutes in the short term. But Esso petrol is a very good substitute for Shell petrol. In general, a product category like petrol, carpets or haircuts has a much lower price elasticity of demand than products within that category made by individual businesses.

However strong the branding and however little the competition that an individual product faces, it is still likely that a business will sell at a price where demand is price elastic. To understand why, consider a product which has inelastic demand. As explained above, raising the price of the product would increase sales revenue. It would also reduce sales and costs of production would fall. So profits would rise. A profit maximising firm should therefore continue raising price until demand is price elastic.

If demand is price elastic, raising price leads to a fall in sales revenue, but also a fall in costs because less is sold. At the profit maximising point, any further increase in price would see the fall in sales revenue being greater than the fall in costs.

This would suggest that even strongly branded goods, such as Coca-Cola or McDonald's meals, have a price elasticity of demand greater than one at the price at which they are sold. It also suggests that luxury brands, such as Chanel or Gucci, also have elastic demand at their current price.

Problems of measuring price elasticity of demand

There may be problems for small businesses in calculating the price elasticity of demand for their products.

Collecting data A business wanting to know about the price elasticity of its products would need to collect data on demand changes in relation to price for its own products to know the price elasticity of demand for these products. This would mean that they would need to experiment with price changes and to monitor consumer reaction. For many small businesses,

Question 2.

Kaldor Ltd manufactures reproduction juke boxes which play CDs. Jukeboxes that play old 45 records can cost around £1,000 or a great deal more. Large jukeboxes in pubs can cost thousands of pounds as well. But Kaldor had seen other 'reproduction' jukeboxes that did not cost as much and were far smaller. It decided to manufacture smaller jukeboxes that stand on a table. They sold for £200 and hold three CDs at a time. The jukeboxes have been selling well and so the business raised the price to £240. As a result sales fell from 800 to 600 per month. Kaldor is now questioning the decision to raise the price.

- (a) Discuss whether or not the decision to raise the price was a good choice by the business.

Price - the influence of demand

especially those with a very small number of customers this would be impractical. The dangers of experimenting in this way could lead to a loss of business that would be difficult to recover. Small businesses also often do not have the time or resources to research such matters.

Predicting human behaviour Human behaviour is notoriously difficult to predict and the way that people respond on one day of the week, for example, may be different to how they will respond on others. In addition, consumers do not always act as they say they will. For this reason small businesses attempting to research their price elasticity of demand by observing and talking to their customers may not always find it easy to collect reliable data.

Interpreting data When seeking to research their price elasticity of demand it is not always easy for small business to make sense of the data they collect. Take, for example, a small business selling ice cream from one retail outlet. Were this business to trial a new higher price for its ice creams on one particular day it might find that sales actually rose. They might conclude from this that their ice cream is relatively price inelastic. However, on this same day there could have been because several large coachloads of pensioners swelling the total number of potential consumers and especially high temperatures also inflating demand. In this case it would be difficult for the business to isolate the effect of the price change.

For these reasons many small business estimate their price elasticity of demand rather than calculate it based upon actual research. They will do so based upon their observations of how their customers behave, information from similar businesses and actual sales levels.

Income elasticity of demand

INCOME ELASTICITY OF DEMAND is a measure of the sensitivity of demand to changes in income. It can be calculated using the formula:

$$\frac{\text{Percentage change in quantity demanded}}{\text{Percentage change in income}}$$

Businesses will want to know the income elasticity of demand for their products. This will help them to judge the effect of a change in their consumers' income on the demand for their products.

- If a rise in income leads to a relatively greater rise in quantity demanded then income elasticity of demand is positive and greater than one.
- If a rise in income leads to a relatively smaller rise in quantity demanded then income elasticity is positive but less than one.
- If a rise in income leads to no change in quantity demanded then income elasticity of demand is zero.
- If a rise in income leads to a fall in quantity demanded

then income elasticity of demand is negative.

Advertising elasticity of demand

ADVERTISING ELASTICITY OF DEMAND is a measure of the responsiveness of demand to changes in advertising expenditure. It is measured by the following formula:

$$\frac{\text{Percentage change in quantity demanded}}{\text{Percentage change in advertising expenditure}}$$

Businesses need to be able to measure the effectiveness of their advertising campaigns. One way of doing this is to consider the impact on consumer demand of spending on advertising. This can provide businesses with valuable data which can enable them to judge how far consumers are influenced by advertising campaigns. It also allows businesses to evaluate the relative success of advertising campaigns. If the percentage increase in quantity demanded is a great deal larger than the percentage increase in advertising spending, then advertising elasticity of demand is strong and positive. This may tell a business that advertising is effective in influencing consumers.

Cross elasticity of demand

THE CROSS ELASTICITY OF DEMAND shows the response of quantity demanded of one good to a change in the price of another. It allows a business to gauge how demand for its products will react if the price of either rival's products or complementary goods change. It can be calculated using the formula:

$$\frac{\text{Percentage change in quantity demanded of good X}}{\text{Percentage change in price of good Y}}$$

- Goods which are substitutes and compete with each other have a positive cross elasticity. An increase in the price of one newspaper (good Y) should lead to a fall in demand for this product and an increase in demand for another newspaper (good X). Both changes are positive. A fall in the price of good Y will lead to a fall in the demand for good X. Two negatives cancel out to make a positive.
- Goods which are complements to each other have a negative cross elasticity. An increase in the price of an electrical product (good Y) should lead to a fall in demand for this product and a fall in demand for batteries (good X). One change is positive, the other is negative.

Limitations of demand curves

It is often very difficult for an individual business to develop its own demand curve. This is because many businesses do not have sufficient information to construct their individual demand curves. They do not have the market research data to enable

Question 3.

Bill Finch is a London taxicab driver. Towards the end of 1999, all the talk amongst taxicab drivers was about the new Millennium - whether they were going to drive or be out partying on New Year's Eve. In November 1999, the government, which sets London taxicab fares, announced that London taxis would be able to charge double rate for journeys taken between 8 pm on December 31 and 6 am on January 1st. Those taking journeys long enough to cost more than an ordinary fare of £25 would have to pay a flat rate £25 supplement. This compared to the usual New Year supplement of £3 per journey.

Bill decided he would drive on the Millennium eve, expecting that demand would be highly price inelastic. But he was disappointed with his takings. Many party goers had decided to stay at home because restaurants, pubs and clubs as well as taxis were charging double or more on the night. There was a general feeling amongst the public that they were going to be ripped off if they went out. Where journeys were necessary, many took a private car and agreed in advance which of the party goers would be the non-drinking driver. Bill Finch found that he carried 30 per cent fewer passengers than he typically did on a normal Saturday night in the winter months. None of his journeys on the Millennium eve exceeded the £25 limit.

- Explain what is meant in the passage by 'demand would be highly price inelastic'.
- Explain (i) why it was expected that demand for taxi cab rides would rise on Millennium eve; (ii) how this might have affected the ability of travellers to get a taxi cab ride on that night if fares had NOT risen from their normal levels.
- Using the concepts of price elasticity of demand, revenue and profit, discuss whether Bill made the right decision to drive on Millennium eve.

them to assess the likely demand for their products over a given range of prices. Often this is because of the high cost of collecting

such market information. Such businesses tend to develop a PERCEIVED DEMAND curve. This is a demand curve based upon the 'feel' which managers and owners have for their market. It will involve rough estimations of the likely impact upon demand of upwards or downwards changes in prices.

Some larger businesses with access to detailed market information are in a much better position to develop demand curves which can assist them in making more informed decisions about their prices. However, even for such businesses the demand curve may be of limited value. This is because the demand curve can only provide information about the likely response of consumers to a change in the price of a particular product at a given point in time. In fast changing markets such information may quickly go out of date and will be of limited value unless it is regularly updated.

Normal and inferior goods

Most products have a positive income elasticity. When income rises, so too does demand for the product. These products are called NORMAL GOODS.

However, for some products, a rise in income leads to a fall in their demand. Their income elasticity of demand is negative (because in the formula there is a plus sign on the top and a minus sign on the bottom or vice versa). These products are called INFERIOR GOODS. Examples of inferior goods might include:

- bread - as incomes rise, consumers eat less bread and more expensive foods;
- bus transport - as incomes rise, travellers tend to use trains or cars;
- sugar - increased income tends to be associated with a better diet and a greater awareness of the problems of having too much sugar.

Most products are normal goods. However, some products have a higher income elasticity than others. For example, over the past 20 years, with rising incomes, the demand for services has increased faster than the demand for goods. Services, such as holidays and meals out, have expanded particularly fast.

KEYTERMS

Advertising elasticity of demand - the responsiveness of demand to a change in advertising expenditure.

Cross elasticity of demand - the responsiveness of the demand of one product to a change in the price of another.

Demand - the quantity of a product bought over a given time period.

Income elasticity of demand - the responsiveness of demand to a change in income.

Inferior goods - products which have a negative income elasticity. When incomes rise, the quantity demanded falls and vice versa.

Normal goods - products which have a positive income elasticity. When incomes rise, the quantity demanded rises and vice versa.

Perceived demand - the demand which businesses believe exists for their products in a particular market.

Price elasticity of demand - the responsiveness of quantity demanded to changes in price. It is measured as percentage change in quantity demanded ÷ percentage change in price.

Price elastic demand - when price elasticity is greater than 1, which means that the percentage change in quantity demanded is greater than the percentage change in price which caused it.

Price inelastic demand - when price elasticity is less than 1, which means that the percentage change in quantity demanded is less than the percentage change in price which caused it.

Substitute product - a product which has similar characteristics to another good. For example, gas is a substitute for oil as a fuel in heating systems. Shell petrol is a good substitute for BP Amoco petrol for use as a fuel in cars.

KNOWLEDGE

1. Explain, without using the formula, what is meant by 'price elasticity of demand'.
2. 'The demand for journeys taken on the London Underground is price inelastic.' Explain what this means.
3. (a) What is the formula for price elasticity of demand?
(b) How does it differ from the formula for income elasticity of demand?
4. How can a business estimate the price elasticity of demand for one of its products?
5. Explain why a rise in price would lead to higher revenues if demand for the product were price inelastic.
6. Explain the link between price elasticity of demand and profit.
7. Explain why strongly branded goods such as Coca-Cola or Chanel perfumes are likely to be price elastic at the price at which they are currently sold.
8. Why might a business be interested in its advertising elasticity of demand?

Case Study: *Bodyline*

Bodyline is a small firm based in the West Midlands which manufactures womens' swimwear. Its products are distributed through four main types of outlet - mail-order catalogues, department stores, womens' clothing chains and independent retailers.

The business was set up in early 2005. The two women, Elaine and Penny, who started up the firm had originally been friends at University. One had studied for a degree in Art and Design, the other in Business Studies.

Their main product was to be a swimsuit, the Californian, which had been designed in a wide range of dazzling colours. Their marketing strategy had been to aim for the bottom end of the market, offering a cheap, but fashionable garment which would be within the reach of a wide number of consumers' pockets. Marketing research into the demand for the Californian showed that sales at different prices were likely to be as in Table 6.

Elaine and Penny found that they were able to sell all of their production at a price of £18. They sold Californians at this price for six months and made a fair profit. The market was fairly stable at this time and few sudden changes were expected in the near future. Penny felt that by reducing the price a little they would be able to capture more of the market. Elaine was not so sure and the two debated the decision over the next six months without taking any action.

By early 2007 a number of rival businesses developed similar product lines using bright colours, having seen the initial success of Bodyline in the market. As Elaine had commented, one of the worst things about the new products was that 'the Californian designs no longer stood out in the shops and are the same as other products now available'. In what had seemed like a short period of time to these two entrepreneurs, their niche in the market had all but disappeared.

After their initial success many of the new businesses had attempted to undercut Bodyline's prices. The effect on the demand curve for the Californian is shown in Table 7.

1. What is the relationship between price and demand for Californians shown in Table 6? Use examples in your answer. (6 marks)
2. Calculate the elasticity of demand for Californians for a reduction in price from:



1. £18 to £16;
 2. £16 to £14. (6 marks)
3. Explain whether demand for Californians is elastic or inelastic and how this would affect price and demand. (6 marks)
 4. Using Table 7, explain the idea of cross elasticity of demand for Californians. (10 marks)
 5. Assess whether you think Penny was right to suggest a reduction in price using your answer to (b) and total revenue calculations. (12 marks)

Table 6: Demand for Californians

Price	Quantity of Californians
£14	18,000
£16	14,000
£18	10,000
£20	6,000

Table 7: Effect of a change in competitors' prices on the demand for Californians

Price of other products	Quantity of Californians
£14	16,200
£12	12,600
£10	9,000
£8	5,400