

AS Markets & Market Systems

Cross Price Elasticity of Demand

Very often, a change in the price of one product leads to a change in the demand for another, economists call this the cross-price effect and this is the focus of this chapter.

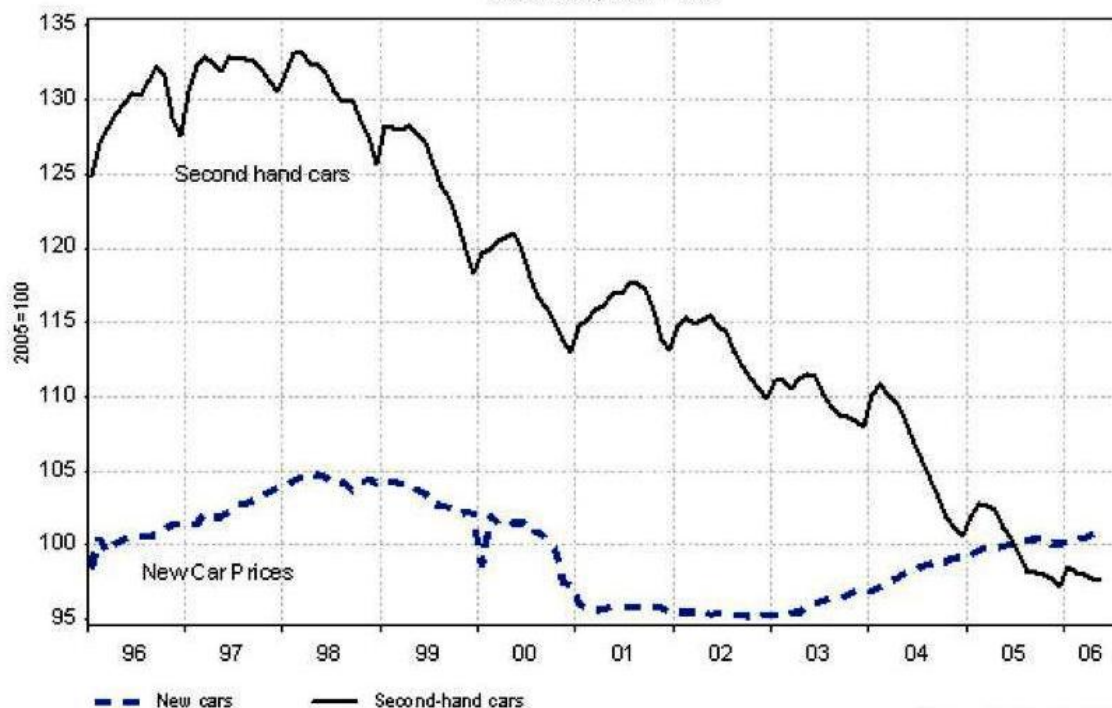
Cross price elasticity (CPed) measures the responsiveness of demand for good X following a change in the price of good Y (a related good). We are mainly concerned here with the effect that **changes in relative prices within a market** have on the pattern of demand.

With cross price elasticity we make an important distinction between **substitute products and complementary goods and services**

Substitutes: With substitute goods such as brands of cereal or washing powder, an increase in the price of one good will lead to an increase in demand for the rival product. Cross price elasticity for two substitutes will be positive. For example, in recent years, the prices of new cars have been either falling or relatively flat. Data on price indices for new cars and second hand cars is shown in the chart below. As the price of new cars relative to people's incomes has declined, this should increase the market demand for new cars and (ceteris paribus) reduce the demand for second hand cars. We can see that there has been a very marked fall in the prices of second hand cars.

Prices of Vehicles in the UK

Price index, 1996 = 100



Source: Reuters EcoWin

Complements: With goods that are in complementary demand, such as the demand for DVD players and DVD videos, when there is a fall in the price of DVD players we expect to see more DVD players bought, leading to an expansion in market demand for DVD videos. The cross price elasticity of demand for two complements is negative

The stronger the relationship between two products, the higher is the co-efficient of cross-price elasticity of demand. For example with two close substitutes, the cross-price elasticity will be strongly positive. Likewise when there is a strong complementary relationship between two products, the cross-price elasticity will be highly negative. Unrelated products have a zero cross elasticity.

Complementary goods - the UK IT market

The value of the UK IT market was estimated to be worth £3.9 billion in the first six months of 2006. It provides a good example of complementary products since a rise in the demand for one product such as a new personal computer will frequently be associated with an increase in demand for related goods and services. The IT market is usually split into seven sectors and their estimated value measured by the level of total sales revenue in the first half of 2006 is shown below

Personal Computers (desktops and laptops) (£1,443m)
Printing devices (£303m)
Monitors (£343m)
Consumables such as ink cartridges (£813m)

Hard disk drives (£130m)
Communication devices (£122m)
Computer software (£239m)

Source: GFK report on Consumer Spending Trends, July 2006

How can businesses make use of the concept of cross price elasticity of demand?

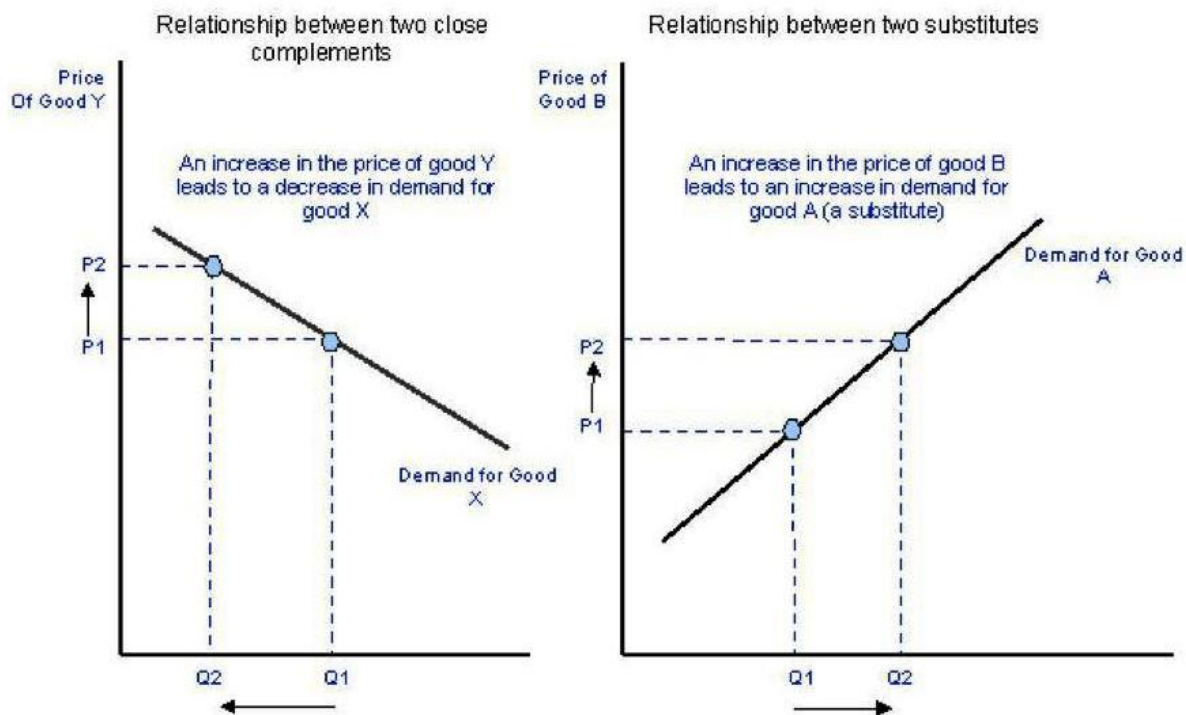
Pricing strategies for substitutes: If a competitor cuts the price of a rival product, firms use estimates of cross price elasticity to predict the effect on the quantity demanded and total revenue of their own product. For example, two or more airlines competing with each other on a given route will have to consider how one airline might react to its competitor's price change. Will many consumers switch? Will they have the capacity to meet an expected rise in demand? Will the other firm match a price rise? Will it follow a price fall?

Consider for example the cross-price effect that has occurred with the rapid expansion of **low-cost airlines** in the European airline industry. This has been a major challenge to the existing and well-established national air carriers, many of whom have made adjustments to their business model and pricing strategies to cope with the increased competition.

Pricing strategies for complementary goods: For example, popcorn, soft drinks and cinema tickets have a high negative value for cross elasticity- they are strong complements. Popcorn has a high mark up i.e. popcorn costs pennies to make but sells for more than a pound. If firms have a reliable estimate for C_{ped} they can estimate the effect, say, of a two-for-one cinema ticket offer on the demand for popcorn. The additional profit from extra popcorn sales may more than compensate for the lower cost of entry into the cinema.

Advertising and marketing: In highly competitive markets where **brand names** carry substantial value, many businesses spend huge amounts of money every year on **persuasive advertising** and marketing. There are many aims behind this, including attempting to shift out the demand curve for a product (or product range) and also build **consumer loyalty** to a brand. When consumers become habitual purchasers of a product, the cross price elasticity of demand against rival products will decrease. This **reduces the size of the substitution effect** following a price change and makes demand less sensitive to price. The result is that firms may be able to charge a higher price, increase their total revenue and turn consumer surplus into higher profit.

Cross price elasticity: Responsiveness of demand of one good to changes in the price of a related good
Goods which are complements: C_{ped} will have negative sign
Goods which are substitutes: Cross elasticity will have a positive sign



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