Cross Price Elasticity of Demand



Cross price elasticity (CPed) measures the responsiveness of demand for good X following a change in the price of a **related good Y**. We are looking here at the effect that **changes in relative prices within a market** have on the pattern of demand. With <u>cross elasticity</u> we make a distinction between **substitute** and **complementary products**.

Substitutes:

With substitute goods such as brands of cereal, an increase in the price of one good will lead to an increase in demand for the rival product. The cross price elasticity for two substitutes will be positive.

For example, the iPhone now provides genuine competition for the Blackberry in providing users with 'push technology' to send all emails through to a mobile device. But how many Blackberry users will switch? Many have become addicted to their machines!

Another good example is the cross price elasticity of demand for music. Sales of digital music downloads have been soaring with the growth of broadband and falling prices for downloads. As a result, sales of <u>traditional music CDs</u> are declining at a steep rate.



Complements:

Complements are in **joint** demand. The CPED 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.

Pricing strategies for substitutes:

If a competitor cuts the price of a rival product, firms use estimates of CPED to predict the effect on demand 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?

Pricing strategies for complementary goods:

Popcorn, soft drinks and cinema tickets have a high negative value for cross elasticity– they are strong complements. <u>Popcorn has a high mark up</u> i.e. pop corn costs pennies to make but sells for more than a pound. If firms have a reliable estimate for CPed 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. For some movie theatres, the revenue from concessions stalls selling popcorn; drinks and other refreshments can generate as much as 40 per cent of their annual turnover.

Brand and cross price elasticity

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 achieve higher profits.



Party Season Nearly Christmas

This mnemonic will help students remember quickly what the figure given by the cross price elasticity of demand formula means.

Positive Substitutes

Negative Complements

Case study in income and cross price elasticity - sat nav systems and atlases



In recent years sales of satellite navigation systems (sat-navs) have grown at the expense of the traditional road atlas. They have obvious advantages over atlases, although they have had some bad publicity with people ending up down isolated farm tracks miles from their destination. Sat-navs are also easily stolen from cars.

Nonetheless they have clearly been seen by many as a superior substitute to atlases although whether they have a clear positive cross elasticity relationship is more debatable. Sat-navs retail at £100 plus and road atlases cost less than £10 for the most basic, and in addition both have been falling in price recently. However, many would feel that they are in competitive demand.

In the five years prior to the recent recession sat-nav sales in Europe doubled to almost 14 million units, whereas sales of road atlases through UK bookshops fell by 17%. This could indicate that sat-navs can be regarded as a normal good and road atlas inferior goods as the launch of the sat-nav occurred alongside rising GDP and real incomes in the economy.

However with the onset of recession the luxury and novelty of having a sat-nav has been tested. In 2009 one of the UK's major retailers of sat-navs is said to have reported sales down by 30%. By contrast in the two months since the launch of the new editions of the Britain 2010 road atlases sales were reported to be up by nearly 10% over the same period last year.

The recession has seen people being much more careful with their spending on perceived luxuries, and having an up-to-date road atlas which is often very cheap via Amazon, book clubs or at petrol stations is now very attractive as a reliable necessity for drivers. It seems that these current sales trends continue to confirm that sat-navs are normal goods and road atlases inferior goods.

The A-Z Map Company has added postcodes against places of interest on their road atlases. This means people can study a road atlas first for routes to wherever they are going and can then use the postcode reference and put it into the sat-nav. Will the products become complements in the future to some extent? Will sales of free-standing sat-navs fall as a people increasingly buy cars with sat-navs as a standard feature? This market has clearly still some way to go.

Source: Bob Nutter, EconoMax, summer 2010

