



Other Demand Elasticities

A Level Economics

1) Income elasticity of demand

Income elasticity of demand shows the responsiveness of demand to a change in the income of consumers – i.e. it shows how much demand changes following a change in income. In this sense it works in the same way as price elasticity of demand, but with one important difference – whereas an increase in price would almost always lead to a fall in demand, an increase in income can lead either to a fall *or* a rise in demand.

In this case the sign attached to the elasticity (reflecting the correlation between the two variables involved) becomes really important.

If a 10% increase in income led to a 5% increase in demand then income elasticity would be:

$$\frac{\% \text{ change in demand}}{\% \text{ change in income}} = \frac{+5\%}{+10\%} = +0.5$$

positive correlation
showing that an
increase in income
leads to an *increase*
in demand

demand changes
half as much as
income

For example: An increase in the income of consumers should lead to an increase in the sales of DVD players.

If the 10% increase in income had led instead to a 5% *fall* in demand then income elasticity would be:

$$\frac{\% \text{ change in demand/sales}}{\% \text{ change in income}} = \frac{-5\%}{+10\%} = -0.5$$

negative correlation
showing that a rise in
income causes a
fall in demand

demand still
changes half as
much as income

For example: A rise in the income of consumers might cause a fall in the sales of 'value lines' as consumers switch to superior alternatives. These are 'inferior' products for which sales often fall during an economic upswing and rise during a recession (hence they are counter-cyclical).

Therefore the sign of income elasticity is critically important in showing whether the product is normal (positive correlation, YED 0 to 1), counter-cyclical/inferior (negative correlation) or a luxury (positive correlation YED >1).

The impact on a firm's marketing strategy would be radically different in each case, even though the actual value (0.5, i.e. inelastic) is the same.

Use of YED to a firm

If reliable, a figure for YED can be quite helpful to a firm when planning strategies to increase sales and revenue.

Firstly, if a firm sells a set of products, YED can be used for *portfolio planning*. If a firm has a set of products with different YEDs – some strongly positive, some positive and some negative, then whatever the stage of the business cycle, the firm should have some products in demand, helping to keep capacity utilisation high during an economic downturn. Therefore knowledge of YED might help a firm when planning new product development, or when looking for areas to expand into.

Secondly, if a firm sold a single product and discovered that on average YED was negative, that should set alarm bells ringing. On average the UK economy grows by about 2–3% per year, meaning that average incomes generally rise. A product with negative YED is likely to suffer declining sales in such a situation. Therefore the firm might use the information to begin a campaign of *image manipulation* – changing customers' perceptions of the product (and probably the product itself) with the aim of protecting the firm's long term survival chances. Alternatively, it may make the firm think about diversifying into other product areas, or look into the possibility of mergers and acquisitions.

Limitations

Income elasticity also suffers from the limitations mentioned under price elasticity above. An additional problem for income elasticity is that most firms sell to a number of different segments, and every segment's income elasticity of demand will differ – poor income groups will have a different view as to what is inferior than rich income groups. Therefore a single income elasticity figure is unlikely to be adequate for most firms' products.

Common misconceptions

Products that have positive income elasticity are very sensitive to price. **No** – income elasticity only says how they will respond to income.

Income inelastic means that when incomes rise, demand will fall. **No** – it is the *sign* which matters, not the value – demand for an income inelastic product may simply not rise very much when income rises – it doesn't have to fall.

Bus travel (etc.) will have negative income elasticity of demand. **No** – it will vary from segment to segment of the market.

Conclusions

Elasticity tells a firm how sensitive demand is to changes in key variables, helping it to take key strategic and tactical decisions on what markets to compete in and what marketing mix to select. Nevertheless, it can only ever be one factor in such a decision – the organisation's overall objectives, culture and other qualitative factors may be far more significant than elasticity in decisions, especially given the limitations mentioned above.

2) Cross elasticity of demand (XED)

XED shows the responsiveness of demand for one product to a change in the price of a related product – a substitute or a complement. XED can be either positive or negative depending on the nature of the relationship. It is measured by:

$$\frac{\% \text{ change in demand for good 'A'}}{\% \text{ change in price of good 'B'}}$$

In the case of substitutes, an increase in the price of (for example) gin is likely to result in an increase in the sales of vodka, as people switch away from gin. Therefore there is a positive correlation.

For complements the reverse will be true. An increase in the price of gin will reduce the demand for gin, and will therefore also cut the demand for associated products such as tonic. Therefore the correlation is negative (an increase in price of 'B' leads to a decrease in the demand for 'A').

<p>XED +ve: Substitutes XED –ve: Complements</p>
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The higher the actual value for XED, the stronger the relationship – if XED is close to zero (either positive or negative) then the relationship is very weak.

Uses of XED to a firm

This obviously depends on whether the goods are substitutes or complements:

(i) Substitutes

If a firm discovers from XED that there are other products that are close substitutes, this means that it is in a strongly priced competitive market. This creates both opportunities and threats for a firm. If the firm is very efficient (low unit costs) this might mean that a price cut would be worthwhile – the firm would win a large share of the market, and would fare quite well in the inevitable price war that would follow because of its low costs.

Most firms, however, dislike the uncertainty that such market conditions imply, and will take action to reduce XED. This might involve concentrating on product differentiation and advertising to create a strong brand image, therefore insulating the firm's products from price cuts by other firms.

(ii) Complements

If XED is high and negative, this implies that the firm has other products strongly associated with its own. If it does not own these other products, then this may suggest a strategic takeover move in the future. If it does own the other products, however, there are a couple of actions that the firm might consider.

Firstly, the firm might consider making use of *loss leaders*. This is common practice in supermarkets, where most products are complementary to others. By accepting a loss on certain products, such as instore bread, the firm is able to entice customers into the store, and is therefore able to make a profit on the visit overall, due to the purchases of other related products.

Secondly, there are some markets where the two products are so closely linked that they are effectively in joint demand. In this case, the firm can use *captive product pricing*. An example might be games consoles and games. The idea is to lock customers into your system by offering the hardware at comparatively favourable prices. Once the customer is committed to your format, however, it is possible to make far more profit on the games. Generally, margins in the industry are about 10% on the consoles, but around 40% on games.