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Economics Revision Focus: 2004

AS Economics

Income Elasticity and Cross-price Elasticity

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Revision Focus on Income Elasticity and Cross-price Elasticity (AS)

AS Syllabus Requirements

Income elasticity and cross-price elasticity of demand

Candidates should understand the significance of cross price and income elasticities of demand in influencing the extent of any fluctuations in market prices and in affecting the inter-relationships between markets

Income elasticity of demand (Yed)

How sensitive is the demand for a product to a change in the real incomes of consumers? We use income elasticity of demand to measure this. The results are important since the values of income elasticity tell us something about the nature of a product and how it is perceived by consumers. It also affects the extent to which changes in economic growth affect the level and pattern of demand for different goods and services.

Income elasticity of demand measures the relationship between a change in quantity demanded for good X and a change in real income.

The formula for calculating income elasticity is:

% change in quantity demanded DIVIDED BY Percentage change in income

Normal Goods

Normal goods have a **positive income elasticity of demand** so as consumers' income rises, so more is demanded at each price level i.e. there is an outward shift of the demand curve

1. **Normal necessities** have an income elasticity of demand of between 0 and +1 for example, if income increases by 10% and the demand for fresh fruit increases by 4% then the income elasticity is +0.4. Demand is rising less than proportionately to income.
2. **Luxuries** have an income elasticity of demand $> +1$ i.e. the demand rises more than proportionate to a change in income – for example a 8% increase in income might lead to a 16% rise in the demand for restaurant meals. The income elasticity of demand in this example is +2.0. Demand is highly sensitive to (increases or decreases in) income.

Inferior Goods

Inferior goods have a **negative income elasticity of demand**. Demand falls as income rises. Typically inferior goods or services tend to be products where there are superior goods available if the consumer has the money to be able to buy it. Examples include the demand for cigarettes, low-priced own label foods in supermarkets and the demand for council-owned properties.

The income elasticity of demand is usually strongly positive for

- Wines and spirits

- Consumer durables - audio visual equipment, 3rd generation mobile phones and new kitchens
- Sports and leisure facilities (including gym membership and sports clubs)

In contrast, income elasticity of demand is lower (but still positive) for

- Staple products such as bread, vegetables and frozen foods
- Mass transport (bus and rail)
- Beer and takeaway pizza

Product ranges: However the income elasticity of demand varies *within* a product range. For example the Yed for own-label foods in supermarkets is probably less for the high-value “finest” food ranges that most major supermarkets now offer. You would also expect income elasticity of demand to vary across the vast range of vehicles for sale in the car industry and also in the holiday industry.

Long-term changes: There is a general downward trend in the income elasticity of demand for many products, particularly foodstuffs. One reason for this is that as a society becomes richer, there are changes in consumer perceptions about different goods and services together with changes in consumer tastes and preferences. What might have been considered a luxury good several years ago might now be regarded as a necessity (with a lower income elasticity of demand). Consider the market for foreign travel. A few decades ago, long-distance foreign travel was regarded as a luxury out of the reach of the majority of households. Now as real price levels have come down and incomes have grown, so millions of consumers are able to fly overseas on short and longer breaks. For many an annual holiday overseas has become a necessity and not a discretionary item of spending!

Estimates for income elasticity of demand

These estimates draw on research from DEFRA, the Government department. The table below shows the estimated price elasticity of demand and income elasticity of demand for a selection of foods:

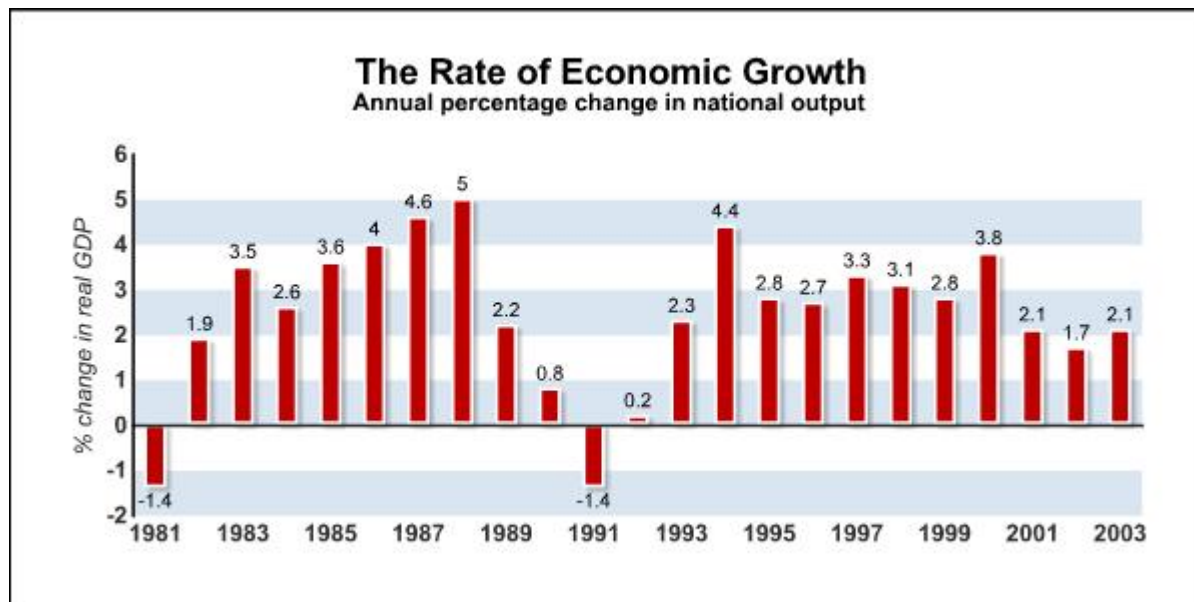
Product	Share of budget (% of household income)	Price elasticity of demand	Income elasticity of demand
All Foods	15.1	n/a	0.2
Carcase meat	1.15	-0.69	0.2
Fruit juices	0.19	-0.55	0.45
Tea	0.19	-0.37	-0.02
Instant coffee	0.17	-0.45	0.16
Margarine	0.03	n/a	-0.37

Source: DEFRA

The income elasticity of demand for most generic types of food is pretty low – occasionally negative (e.g. for margarine) and likewise the own price elasticity of demand for most foodstuffs is also inelastic.

How do businesses make use of estimates of income elasticity of demand?

Knowledge of income elasticity of demand for different products helps firms predict the effect of a business cycle on sales. All countries experience a business cycle where actual GDP moves up and down in a regular pattern causing booms and slowdowns or perhaps a recession. The business cycle means incomes rise and fall. Luxury Products with a high income elasticity experience greater sales volatility over the business cycle than necessities where demand from consumers is less sensitive to changes in the economic cycle



The UK economy has enjoyed a period of sustained economic growth over the last twelve years. So average real incomes have increased, but because of differences in income elasticity of demand, consumer demand for products will have varied greatly over this period.

Cross Price Elasticity of Demand (Cped)

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 falling. This should increase the demand for new cars and (ceteris paribus) reduce the demand for second hand cars and mass transport services such as bus travel (ceteris paribus). A similar example would be the market for digital cameras.

Prices of digital cameras have dropped sharply over the last five years and consequently they are much more affordable to consumers. Demand for digital cameras has soared but conversely demand for disposable cameras and traditional 35mm film cameras declined. Indeed in 2004, Kodak announced that it planned to stop selling its APS and re-loadable 35 mm film cameras in the United States, Canada and Western Europe and refocus their production and sales of 35 mm film cameras into 'emerging markets' such as China, India, Eastern Europe and Latin America.

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 very 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 C_{ped} .

Application of the concept: How can firms make use 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 very high mark up i.e. pop corn 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 particular brand. When consumers become habitual purchasers of a product, then the cross price elasticity of demand against rival products decreases. This **reduces the substitution effect** of a given 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.

