What is meant by price elasticity of demand? How can we measure the elasticity of demand? Why is an understanding of elasticity of demand important to both business firms and the government?

Consumers in a market economy are influenced by various factors in deciding what to buy. One of these factors is price, and the law of demand that defines the typical relationship between price and quantity demanded states that consumers will demand more of a particular product at a lower price, and less at a higher price. However, the price elasticity of demand extends this and examines the extent of such changes in demand in relation to price. How much demand contracts or expands in response to a price change is of importance to businesses and governments, and hence methods such as the total outlay method have been developed to test the price elasticity of demand at various price levels.

The price elasticity of demand measures the responsiveness or sensitivity of the quantity demanded of a particular product to changes in its price. As a figure, the price elasticity of demand shows the percentage change in the quantity of a good demanded resulting from a 1% increase in its price. Demand can hence be said to be relatively elastic, relatively inelastic or unitary elastic. We know that for most goods, a fall in price will cause an expansion in demand, but if that expansion in demand were proportionately greater than the fall in price, then we would say that quantity demanded is very responsive to a price change; thus demand is said to be relatively elastic. The opposite situation, relatively inelastic demand, indicates that there has been a less than proportionate change in quantity demanded – a weak response to price change. When the total amount spent remains unchanged, the proportionate change in quantity demanded is the same as the proportionate change in price, and demand is said to be unitary elastic.

There are other methods of determining the price elasticity of demand, such as the arc method and the point method, but the total outlay method is a simple way of measuring price elasticity. It looks at the effect of changes in price on the total revenue earner by the producer. Total outlay (or revenue) is found by multiplying price by the quantity that would be demanded at that price. In effect, the total outlay (or total expenditure) by consumers on a certain product is equivalent to the total revenue that sellers of the product would receive at that price.

Price $	**Quantity demanded (units)**	**Total outlay (price x quantity)**	**Elasticity**
5	50	250	> Inelastic
6	45	270	> Inelastic
7	40	280	> Unitary
8	35	280	> Elastic
9	30	270	> Elastic
10	25	250	

If total outlay moves in the same direction as the price change, demand in that price range would be relatively inelastic. Consumers demand 50 units at a price of $5, so total outlay is $250. When the price rises to $6, demand falls to 45 units, but the total outlay increases to $270. Total outlay has moved in the same direction as the price change – the price increase would lead to an increase in total revenue for firms, therefore demand is said to be relatively inelastic over this price range.

If total outlay moves in the opposite direction to the price change, demand in that price range would be relatively elastic. At a price of $8, consumers demand 35 units, so the total outlay is $280. If the price rises to $9, demand falls to 30 units, and total outlay decreases to $270. Total outlay has moved in the opposite direction to the price change – the quantity demanded is highly responsive to price changes. Hence, demand is said to be relatively elastic over this price range.

If total outlay remains the same following a price change, then the demand would be said to be unitary elastic. At price $7, consumers demand 40 units, so the total outlay is $280. When the price rises to $8, demand falls to 35 units, but the total outlay remains the same at $280. Total outlay has remains the same, so demand has unitary elasticity over this price range.

This shows that, even with a linear demand curve, which has a constant slope, the price elasticity of demand will vary along the curve. In the upper part of the curve (where prices are high), demand will be relatively elastic (quantity demanded is highly responsive to price changes), whereas at low levels, demand will be relatively inelastic. When using graphs, the price elasticity of demand over a particular price range can be determined by using the total outlay method with the price and quantity demanded from the graph.

Hence, by using diagrams, we can recognise two extremes of elasticity of demand – perfectly elastic demand and perfectly inelastic demand. These two extreme circumstances are the only ones where looking at the slope of the demand curve is sufficient to determine the price elasticity of demand through the entire curve. When demand is perfectly elastic, the demand curve is a horizontal straight line, and when demand is perfectly inelastic, the demand curve is a vertical straight line.

With perfectly elastic demand, consumers will demand an infinite (unlimited) quantity at a certain price, but nothing at all at a price above or below this. It would be very hard to satisfy these conditions for any market as a whole, so this situation can be regarded as being merely theoretical. However, an individual seller may face perfectly elastic demand in certain circumstances. If the seller were in a perfectly competitive market, then no individual seller would be able to charge a higher price, since he or she would lose all customers to the others selling identical products. In addition, the seller would not seller the product at a price below the other growers, because he or she can sell it at the higher market price and make more money. Therefore, from the point of the individual seller, the demand curve for the product is perfectly elastic at the going market price.

For perfectly inelastic demand, consumers are willing to pay any price in order to obtain a given quantity of a good. Again, it would be very difficult to satisfy these conditions for any market as a whole. It could however apply to some products over a given range of prices. For example, persons with a life threatening disease that can only be treated with a particular drug would be willing to pay almost any price to obtain that drug. Thus, it is often argued that governments should regulate such markets, in order to prevent the exploitation of vulnerable consumers.

The price elasticity of demand for any good can be affected by one or more of five factors. Firstly, price elasticity of demand depends on whether the good is a luxury or a necessity. Goods and services regarded as necessities for daily life, such as bread or milk, have a relatively inelastic demand – even if there is an increase in price, the quantity demanded will not contract greatly. On the other hand, price elasticity of demand would be expected to be higher for products that may be regarded as luxuries, such as dining out in restaurants.

Goods and services with close substitutes, such as different brands of breakfast cereal, tend to have highly elastic demand. If the price of one brand of cereal increases, then demand is likely to contract more than proportionately, since people would simply switch to another brand that they perceive to be equally as good. Goods and services with few or no close substitutes, such as the local water supply, would have an inelastic demand – even if price increases, people cannot switch to another product, so demand will not fall greatly.

Goods and services that take up a very small proportion of a person’s income, such as disposable lighters, cheap pens, and chewing gum, would have a lower price elasticity of demand, whereas the demand for more expensive items would tend to be more elastic. For example, most people would not refuse to buy chewing gum because its price increased by 10%, but they may well decide not to buy a new car which has had a 10% price rise.

When the price of a certain product increases, the quantity demanded may not initially respond greatly, as consumers become aware and take time to adjust to the price change. If the price has increased, with time consumers will have the opportunity to seek out alternatives, and in particular, identify substitute products making demand more responsive. Similarly, if the price of a

product has fallen, with time as consumers become aware that it is relatively cheaper now compared to its substitutes, they switch towards it and demand becomes more responsive.

The responsiveness subsequent to a price change may also depend on whether the good in question is durable or not. After an initial price change, durable goods tend to have a more elastic demand than non-durable goods. For example, a rise in price of new cars would initially tend to encourage people to repair rather than replace their existing cars, so demand would be highly elastic. However, with time, the elasticity would decline, as old cars have to be replaced at some point.

Goods that tend to be habit forming, like cigarettes and alcoholic beverages, tend to have a relatively inelastic demand. People who regularly drink alcohol and smoke tend to continue with the same habits, even following price increases.

Intimate knowledge of the price elasticity of demand and factors that may alter it is important to both businesses and the government. Business would like to maximise profits, and utilisation of price elasticity of demand to determine the best pricing policy is thus very important. The government needs to understand price elasticity of demand to price community goods and services, and to determine levels of taxation on particular products.

Business firms needs to understand price elasticity of demand for the goods they sell in order to decide on their optimal pricing policy. If demand were relatively elastic, the firm would know that lowering the price would expand the volume of sales, thus increasing total revenue. On the other hand, if demand were relatively inelastic, the firm could increase the price, which would also lead to an increase in total revenue, since the drop in sales would be less then proportionate. Awareness of the elasticity of demand in different price ranges is important for determining the best pricing policy for a firm and in deciding whether to change prices. To that extent, businesses often engage in statistical market research in order to determine consumer preferences, and in particular, the price elasticity of the demand for their product.

The government needs to understand price elasticity of demand when pricing the goods and services that it provides for the community (such as public transport fares). Further, it also needs to be able to predict the effects of changes in the level of any indirect taxes, such as sales taxes, excise duties and special levies that is imposes on goods such as alcohol, tobacco products and petrol. These taxes and charges raise the price of the goods affected, and the government needs to be able to gauge the responsiveness of demand in order to estimate accurately the amount of revenue they will raise.

This relationship explains why governments tend to charge indirect taxes, such as excise duties, on those goods that have a relatively inelastic demand, including alcohol, petrol and tobacco products. On the other hand, if the government were to impose an excise duty on a good for which demand is relatively price elastic, the increase in price caused by the tax would lead to a more than proportionate drop in sales. As a result, the increase in the tax may not raise revenue significantly.

In conclusion, economics is a social science of human needs and wants that must be satisfied. In market economies, consumers can exercise their right to buy whatever they want. However, consumers will only purchase certain goods in certain quantities at certain prices; if there is a price change, quantity demanded will adjust correspondingly. This is where price elasticity of demand comes in, measuring the responsiveness or sensitivity of the quantity demanded to changes in price using methods such as the total outlay method. Finally, this information is important to businesses, which need to find their optimal pricing policy in order to achieve their goal of maximising profits, as well as to governments, which need to price their own goods and services and determine indirect taxes imposed on goods and services.