

Elasticities

GCE A-LEVEL & IB ECONOMICS



Lesson Structure

Elasticities

- Price Elasticity of Demand (PED)
- Cross Elasticity of Demand (XED)
- Income Elasticity of Demand (YED)
- Price Elasticity of Supply (PES)



PED measures the responsiveness of quantity demanded, given a change in price. (along the supply curve)

PED = % Change in Qd / % Change in P

If PED > 1, what does this mean?

If PED < 1, what does this mean?

Try drawing the demand curve if this is the case.



Calculating PED:

The following table provides data on the price and quantity demanded (per month) of three goods in Zestria.

	Good A		Good B		Good C	
	Price	Quantity	Price	Quantity	Price	Quantity
	(5 per unit)	demanded	(\$ per unit)	demanded	(\$ per unit)	demanded
January 2014	8	160	10	200	15	100
February 2014	б	220	10	190	15	150

(e) (i) Calculate the price elasticity of demand for Good A when its price falls between January 2014 and February 2014. [2]



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(e) (i) Calculate the price elasticity of demand for Good A when its price falls between January 2014 and February 2014. [2]

PED = % Change in Qd / % Change in P

= [(220 - 160) / 160] / [(6 - 8) / 8] = - 1.5

Note that PED is nearly ALWAYS calculated to be negative. Why do you think that is?







Can you think of some goods or services that are

Price elastic?

Price inelastic?



Can you think of some goods or services that are

Price elastic?



Price inelastic?





What do you think determines the elasticity of these goods?

Price elastic CUCC CUCCC CUCC CU



What do you think determines the elasticity of these goods?

- Price of good as a % of Income: higher % of income -> more elastic, higher PED
- Degree of necessity: more of a necessity -> less elastic, lower PED

 Number and closeness of substitutes: higher number/closeness -> more elastic, higher PED

- Time period: PED for products generally become more elastic in long run as consumers will be able to adapt their purchasing habits and find other substitutes.



But what if the proportional change in quantity demanded caused by price is the same? i.e. PED = 1.



When PED = ∞ , demand is perfectly elastic.



A very small change in price results in an infinite change in quantity. Hence demand is horizontal. No change in price can cause a change in quantity. Hence, demand is a vertical.

When PED = 0, demand is perfectly inelastic.



But what if the proportional change in quantity demanded caused by price is the same? i.e. PED = 1.



But what if the proportional change in quantity demanded caused by price is the same? i.e. PED = 1.



In that case, demand is said to be unitary elastic.



What's the point of studying this you ask?





Step 1: Learn PED

Step 2: Use it in Business

Step 3: Decrease prices when demand is elastic; raise prices when demand is inelastic

Step 4: \$\$\$





What will happen when you raise prices when demand is inelastic; and lower prices when demand is elastic?





It increases firms' total revenues significantly. Revenues = Price x Quantity Sold.





Another applications of PED:

Tax revenues and policies:

- The government receives higher tax revenue by imposing it on inelastic goods. This is part of the reason why cigarettes, petrol and alcohol are so highly taxed.

Manufactured goods vs Primary commodities:

- Manufactured goods tend to have a high PED because they are not necessities but have many close substitutes. E.g. socks, toys and furniture

- Primary commodities tend to have a low PED because they are usually necessities with no close substitutes. E.g. wheat, cow leather, raw cane sugar, coal



PED on a Demand Curve



The upper parts of the demand/revenue curve is PED elastic; the middle part is unitarily elastic; and the lower parts PED inelastic.

(Not to be confused with the steepness)



PED on a Demand Curve





PED on a Demand Curve





XED measures the responsiveness of quantity demanded, given a change in price of another good.

XED = % Change in Qd for good A / % Change in P for good B

It demonstrates the relationship between the two goods.



What relationships do these pairs of goods have?







XED = % Change in Qd for good A / % Change in P for good B When will XED be:

Positive?

Negative?



XED = % Change in Qd for good A / % Change in P for good B

XED is **Positive when:** increase in price for B leads to an increase in demand for A; or a decrease in price B leads to a decrease in demand for A.

Meaning A and B are substitutes

XED is Negative when: decrease in price for B leads to an increase in demand for A; or an increase in price B leads to a decrease in demand for A.

Meaning A and B are complements



XED = % Change in Qd for good A / % Change in P for good B

What if XED is 0?

There is 0 change in Qd for good A despite a change in price for good B. E.g. toilet brushes and spicy curries.

Meaning A and B are unrelated.

The bigger the XED, the bigger effect price of B has on demand for A. This signifies a closer relationship.







XED = % Change in Qd for good A / % Change in P for good B

What an increase in B's price and increase in A's quantity will look diagrammatically: (+ve XED, substitutes)





How can businesses utilise XED?

- Identify and monitor prices of goods with a positive/negative XED to what they produce, as it will affect their revenues

- Offer goods with high negative XED values (i.e. complements) to promote cross selling of products they offer.

- Offer goods with low positive XED values (i.e. goods with little or no substitutes) and enter into a market with little competition and keep prices high.



Calculating XED:

The following table provides data on the price and quantity demanded (per month) of three goods in Zestria.

	Good A		Good B		Good C	
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(ii) Calculate the cross elasticity of demand between Good A and Good B when the price of Good A falls between January 2014 and February 2014. [2]



Calculating XED:

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(ii) Calculate the cross elasticity of demand between Good A and Good B when the price of Good A falls between January 2014 and February 2014. [2]

PED = % Change in Qd of A / % Change in P of B

= [(190 - 200) / 200] / [(6 - 8) / 8] = 0.2



What is YED?

YED measures the responsiveness of quantity demanded, given a change in income.

YED = % Change in Qd / % Change in income



Normal goods: Goods where demand increases as income increases (e.g. cars in China) Inferior goods: Goods where demand decreases as income increases (e.g. bikes in China)

What do you think the YED of these goods would be?

YED = % Change in Qd / % Change in income



Normal goods: Goods where demand increases as income increases (e.g. cars in China) Inferior goods: Goods where demand decreases as income increases (e.g. bikes in China)

What do you think the YED of these goods would be?

YED = % Change in Qd / % Change in income

Normal goods will have a positive YED; and inferior goods a negative YED.

Note that the entire demand curve for the good shifts when incomes increase/decrease



What do you think are the YED of **luxury goods** (e.g. champagne) and **necessity goods** (e.g. electricity)?

YED = % Change in Qd / % Change in income

YED is relatively inelastic for necessities (YED < 1) as it is bought even if the level of income changes (increases/decreases) greatly

YED is relatively elastic (YED > 1) for luxury goods as it is bought in a great number, once basic necessities are fulfilled.



YED = % Change in Qd / % Change in income

Do you think the YED of these goods and services are high (YED > 1) or low (YED < 1)?





With the concept of YED, producers can predict their revenues relative to the state of the economy. Why is that?

The business cycle (recessions/booms) affects incomes of households and individuals. If YED for necessity goods is inelastic and luxury goods is elastic, this means:

- Producers of primary products (low YED) will see limited change in revenue throughout the business cycle

- Producers of manufactured goods (higher YED) will see fall in revenues during a recession, vice versa

- Producers of services (high YED) will see significant decreases in revenues during a recession, vice versa