

WEBNOTE 123

4 ELASTICITIES....

....the key ideas.

1 formula 4 elasticities - see webnote 122

**PRICE ELASTICITY OF DEMAND:
THE SIMPLE or POINT FORMULA**

**% CHANGE IN QUANTITY
DEMANDED**

% CHANGE IN PRICE

**'reverse of slope' or quantity (x) /
price (y)**

ped-demand

yed-income demand

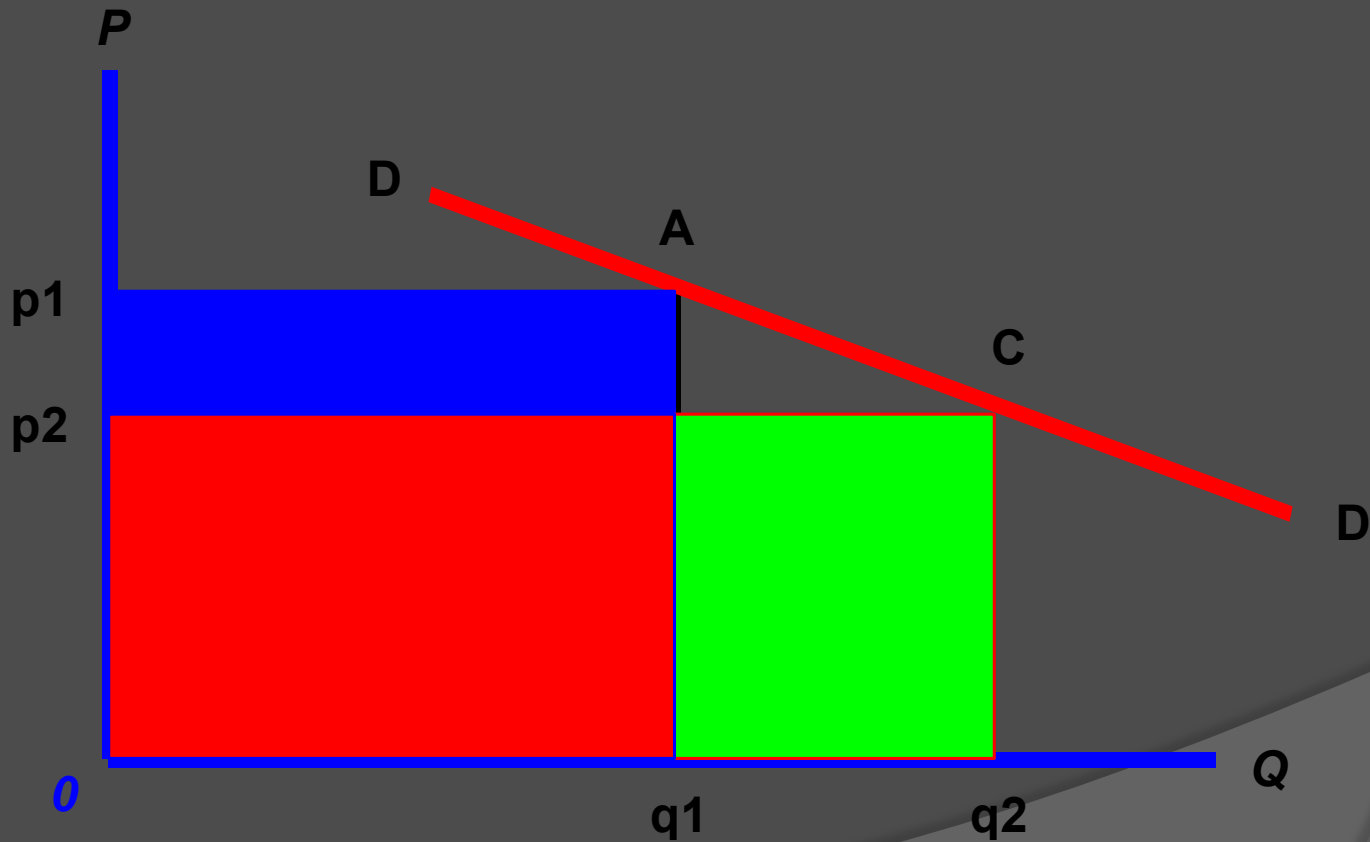
xed-cross demand

pes-supply

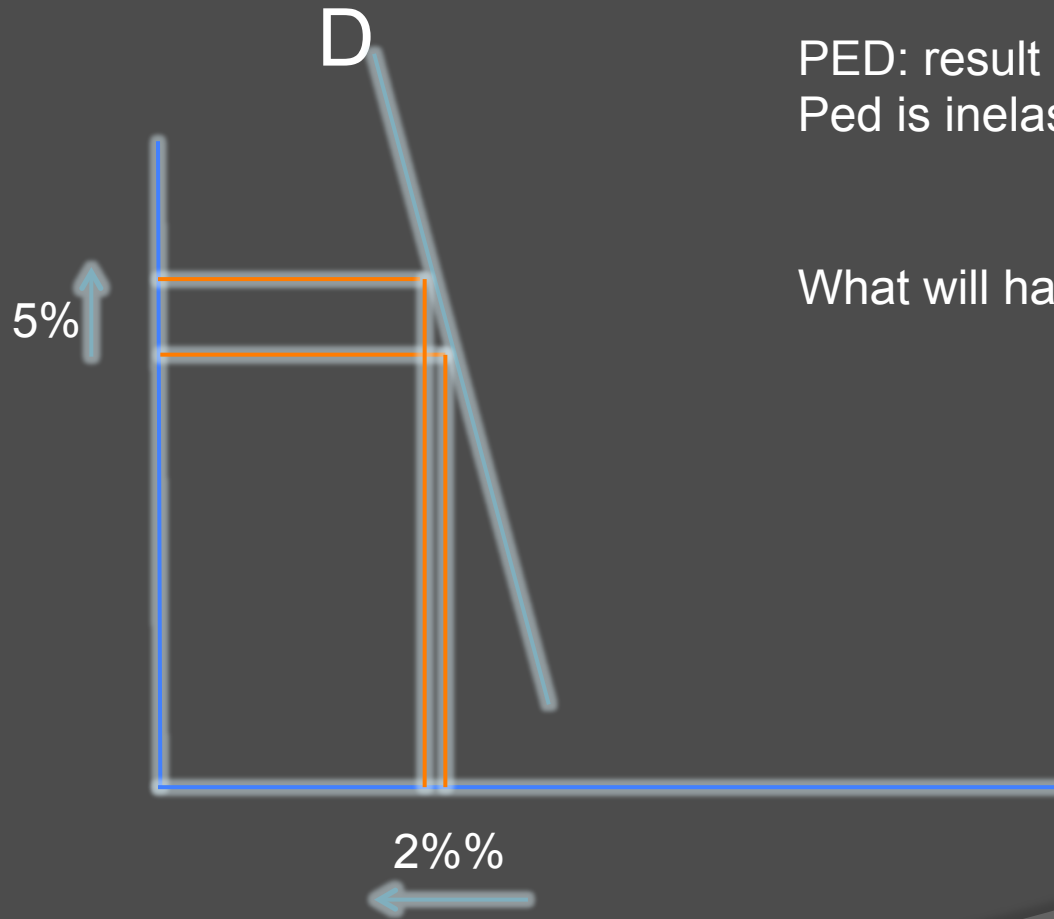
- ⦿ 4 alternative elasticities
- ⦿ Some key points to note for your answerability

What is ped about?

Diagram 1: Price elasticity of demand and total revenue



What is ped about?



PED: result is $-2/+5 = -0.4$
Ped is inelastic.

What will happen to TR?

PeD

Price elasticity allows us to classify goods whereby the results of the elasticity calculation determine one of the following:

1. **TR is key focus. (TR = P*Q)**
2. **NORMAL (ped, negative)**
3. **GIFFEN (ped, positive)**
4. **ELASTIC (e > 1)**
5. **INELASTIC (e < 1)**
6. **UNITARY ELASTIC (e= 1)**
7. **Elasticity is a key issue for LDC's.**
8. **commodities / primary goods face price inelastic demand. This is critical for LDC's**

ped

Evaluate PED (useful for long essay)



- Government can use Ped to guide indirect tax policy. How much tax the government want to place on goods + services depending on objectives e.g. demerit goods (cigarettes) can take higher rates of tax due to inelasticity but other goods will have a lower rate because the indirect tax will make the market smaller and government may not want to risk damaging the market
- Firms can use ped to plan pricing and therefore total revenue i.e. total revenue planning will allow the firm to forecast and estimate profit levels and 'what to produce? And how to produce?

- ❖ Ped (and all elasticities) often change at different points on the curve

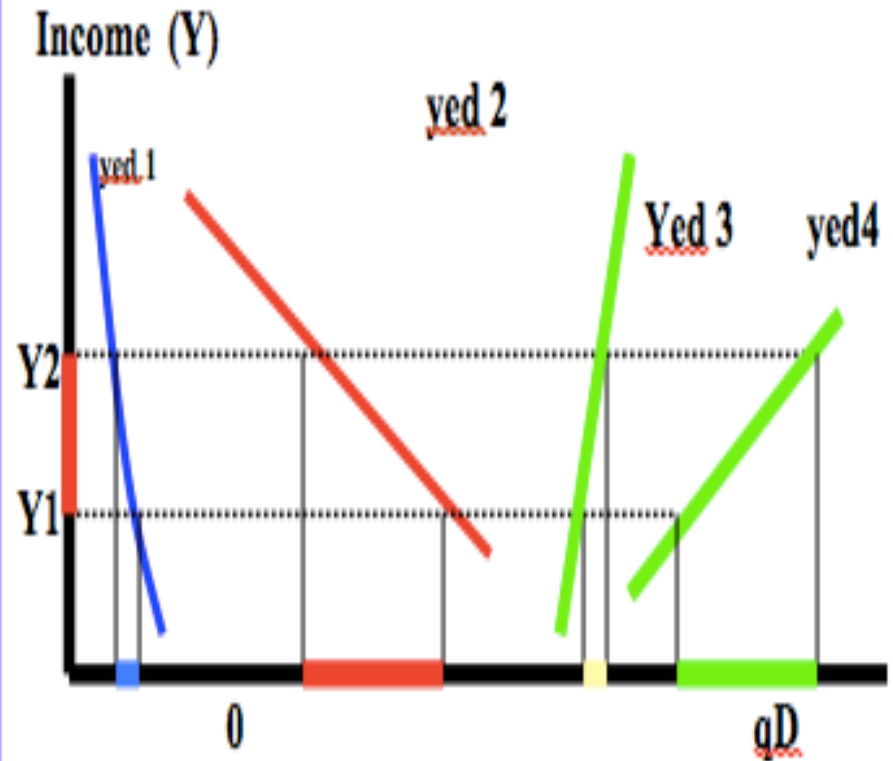
Yed-income elasticity of demand

INCOME ELASTICITY
OF DEMAND:

% CHANGE IN QUANTITY
DEMANDED (Q_d)

% CHANGE IN
INCOME (Y)

Diagram 3: Income Elasticity of demand- 4 outcomes



Yed-income elasticity of demand

INCOME ELASTICITY OF DEMAND:

% CHANGE IN QUANTITY
DEMANDED (Qd)

% CHANGE IN INCOME (Y)

IBQ for 99

May 2014 syllabus 1.2 SL

2(a) Distinguish between the concepts of income elasticity of demand (YED) and cross price elasticity of demand (XED). (10 marks)

2b) To what extent might the concepts of income elasticity of demand (YED) and cross price elasticity of demand (XED) be of significance to business organizations? (15 marks)

May 2013 syllabus 1.2 SL

2(a) Explain the factors which might influence the cross price elasticity of demand between different products.

2 (b) Examine the importance of income elasticity of demand for the producers of primary products, manufactured goods and services.

M13/3/ECONO/SP1/ENG/TZ1/XX

Engel Curve Effect

Engel Curve: situation where the proportion (%) of income spent on food (necessities) decreases as income increases

According to Engel's studies, as the income of a family increases, the proportion of its income spent on necessities such as food falls and that spent on luxuries (consisting of industrial goods and services) increases. In other words, the poor families spend relatively large proportion of their income on necessities, whereas rich families spend a relatively large part of their income on luxuries.

<http://www.economicdiscussion.net/cardinal-utility-analysis/notes-on-income-consumption-curve-and-engel-curve-with-curve-diagram/1040>

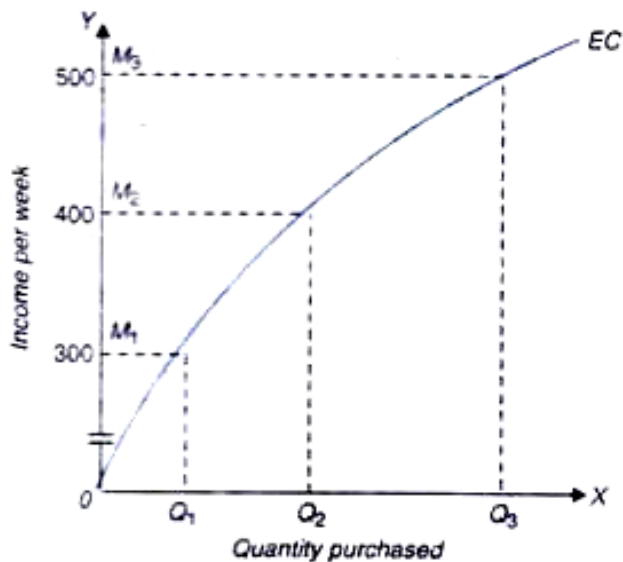
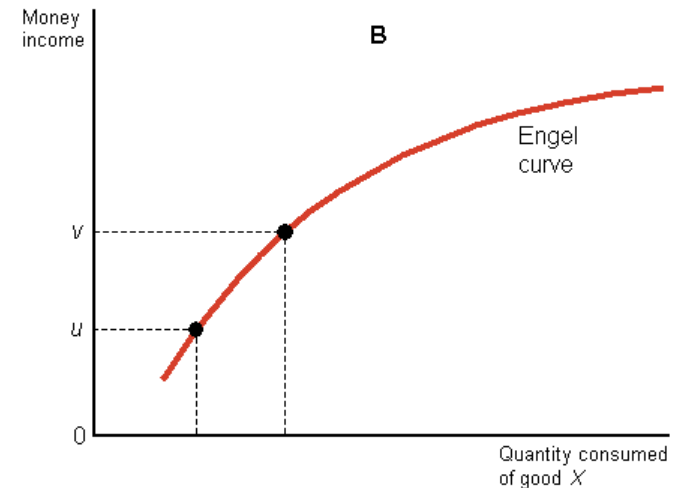


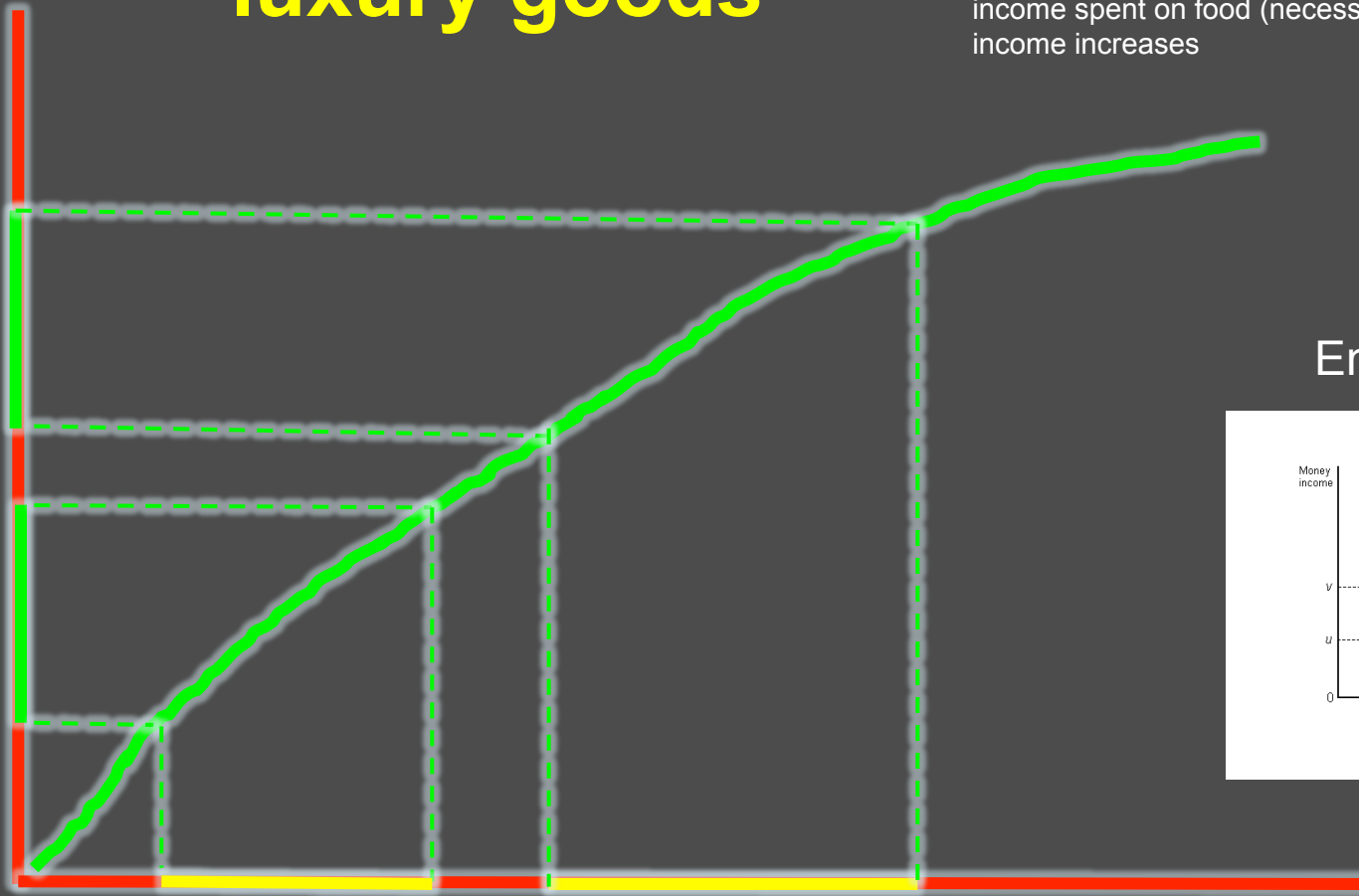
Fig. 8.34. Engel Curve of a Luxury



Engel Curve Effect on demand for luxury goods

Engel Curve: situation where the proportion (%) of income spent on food (necessities) decreases as income increases

Weekly income

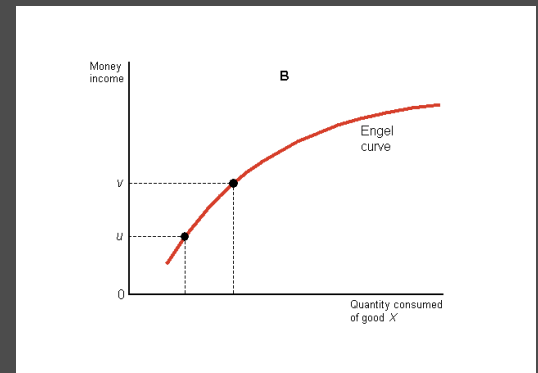


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<http://www.economicdiscussion.net/cardinal-utility-analysis/notes-on-income-consumption-curve-and-engel-curve-with-curve-diagram/1040>

Quantity demanded of luxury goods

Engel curve

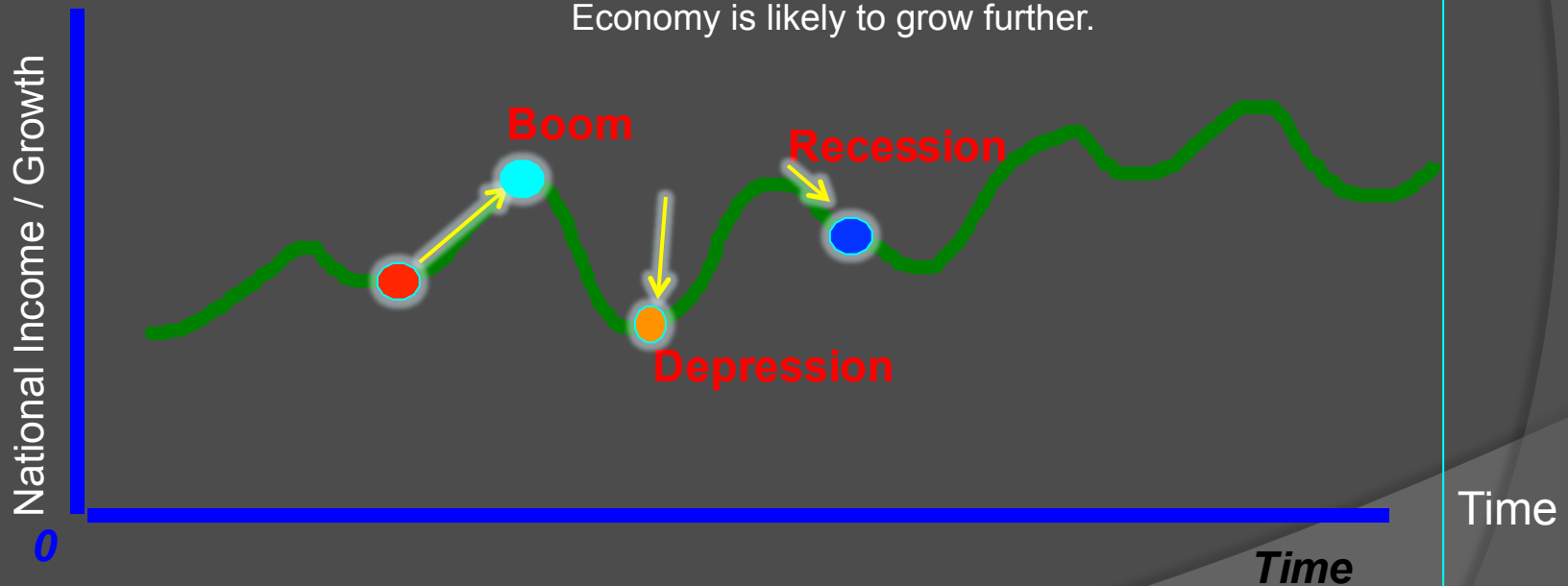


YED + economic growth:

firms like to know how the economy is likely to perform. This assists their planning for output

Diagram 2: Elasticity-Business + Income using a Business Cycle diagram

National Income/Growth



For a detailed business cycle diagram analysis see syllabus 2.1 webnote 214

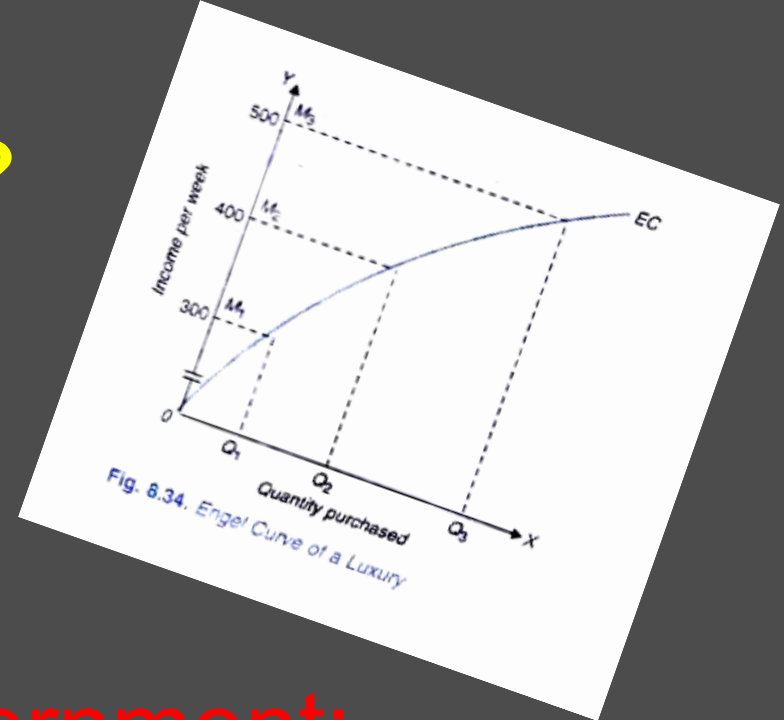
Income elasticity

YED: who is interested?

Firms:

1. does the firm produce inferior (more demand in a recession as demand and spending falls) OR superior goods (more demand in a boom when demand and spending rises)?
2. Firms therefore need to make a business plan as to what they will produce and what quantities of FOP will be required

Why are business and government interested is a BIG question for YED



Government:

1. is interested in order to estimate how better to manage the economy to have more growth and more jobs. Too little spending is bad (unemployment) but too much spending can also be bad (inflation).
2. When government can estimate YED they can also estimate how much tax revenue they will collect and therefore how much they have for merti and public goods

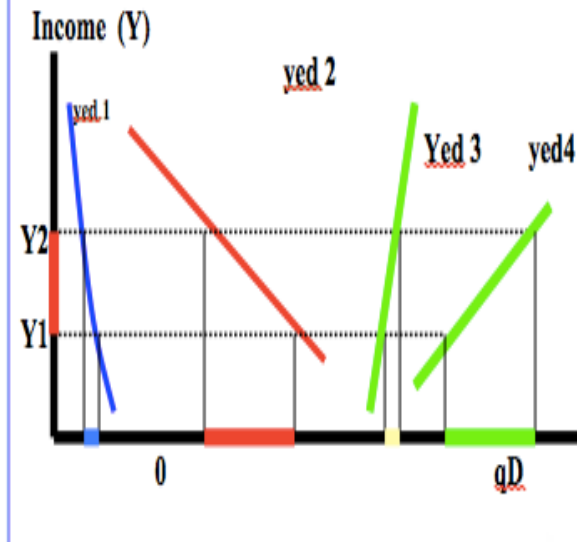
yed

Some key points

Y e D

1. **INFERIOR** (yed, negative)
2. See yed 1+2 in slide 3
3. **ELASTIC** ($e > 1$)
4. **INELASTIC** ($e < 1$)
5. **UNITARY ELASTIC** ($e = 1$)
6. **YED elasticity is a key issue for LDC's commodities / primary goods tend to be income inelastic. Necessities such as food products. This is critical for LDC's (yed 3 in diagram 3, slide 3). Increases in incomes in DC's not a great benefit for LDC's selling low priced food items.**
7. **Manufactured+luxury goods tend to be income elastic (yed 4). DC's benefit by selling luxuries. More profits!**
8. See question 2b on slide 2 above.

Diagram 3: Income Elasticity of demand- 4 outcomes



yed

Evaluate YED (useful for long essay)



- Government can use yed to manage the macroeconomy e.g. how will rises in income affect output in the economy?
- Firms can use yed to plan output for the long run i.e. does firm need more factors of production in order meet increased demand from customers as incomes rise?

- ❖ Yed is difficult to calculate accurately into and results may change over time so planning for the long run will be complicated

XED

CROSS ELASTICITY OF DEMAND:

% CHANGE IN QUANTITY DEMANDED OF GOOD A

% CHANGE IN PRICE GOOD B

see exam question below (May 2004 HL2)

May 2014 syllabus 1.2 SL

2(a) Distinguish between the concepts of income elasticity of demand (YED) and cross price elasticity of demand (XED). (10 marks)

2b) To what extent might the concepts of income elasticity of demand (YED) and cross price elasticity of demand (XED) be of significance to business organizations? (15 marks)

May 2013 syllabus 1.2 HL

2(a) Explain the factors which might influence the cross price elasticity of demand between different products.

XED

CROSS ELASTICITY OF
DEMAND:

% CHANGE IN QUANTITY
DEMANDED OF GOOD A

% CHANGE IN PRICE GOOD
B

see exam question below
(May 2004 HL2)

+ = substitute
goods

- =

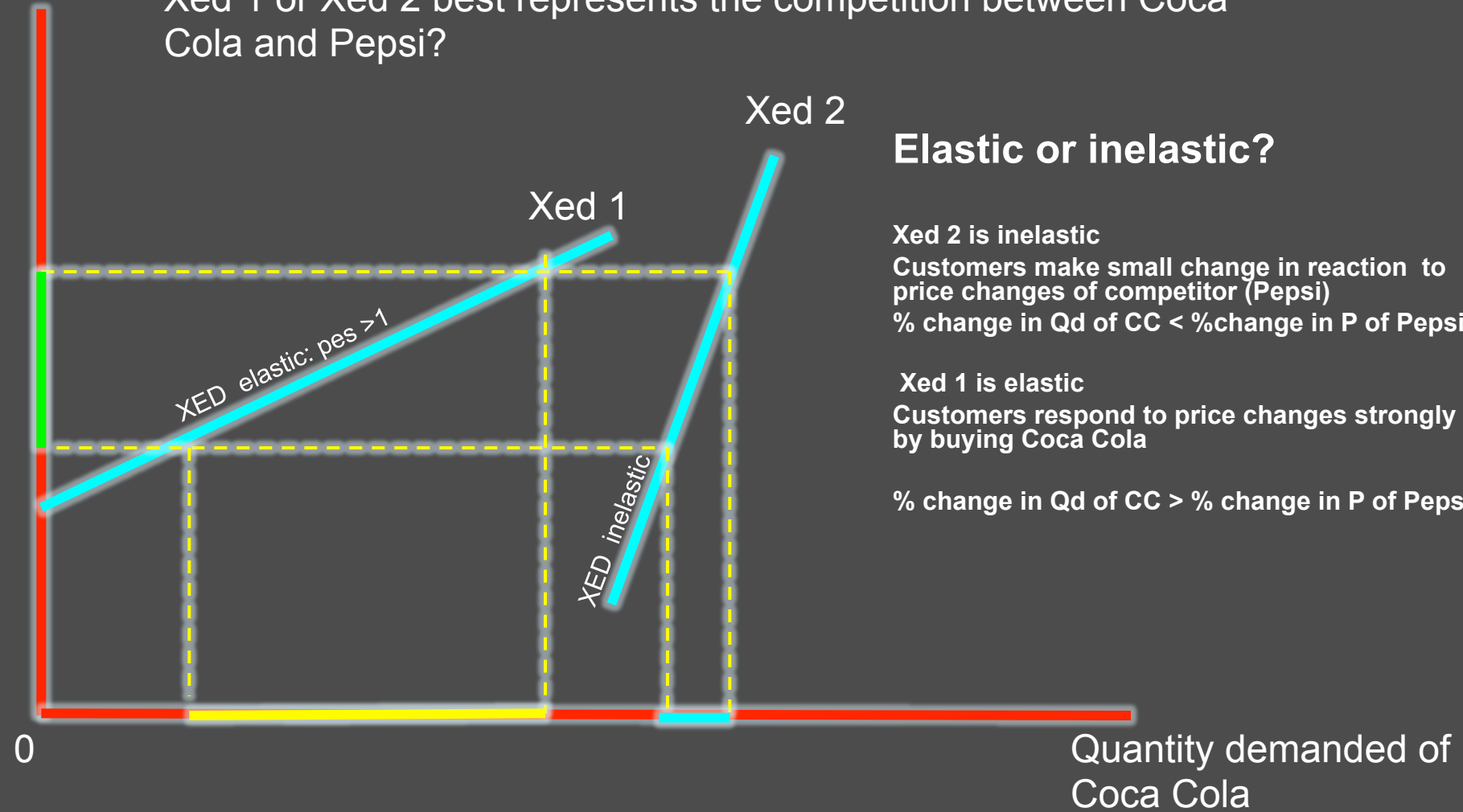
complementary
goods

You can show XED on 1 diagram.

XED: Coca Cola or Pepsi?

Xed 1 or Xed 2 best represents the competition between Coca Cola and Pepsi?

Price Of Pepsi

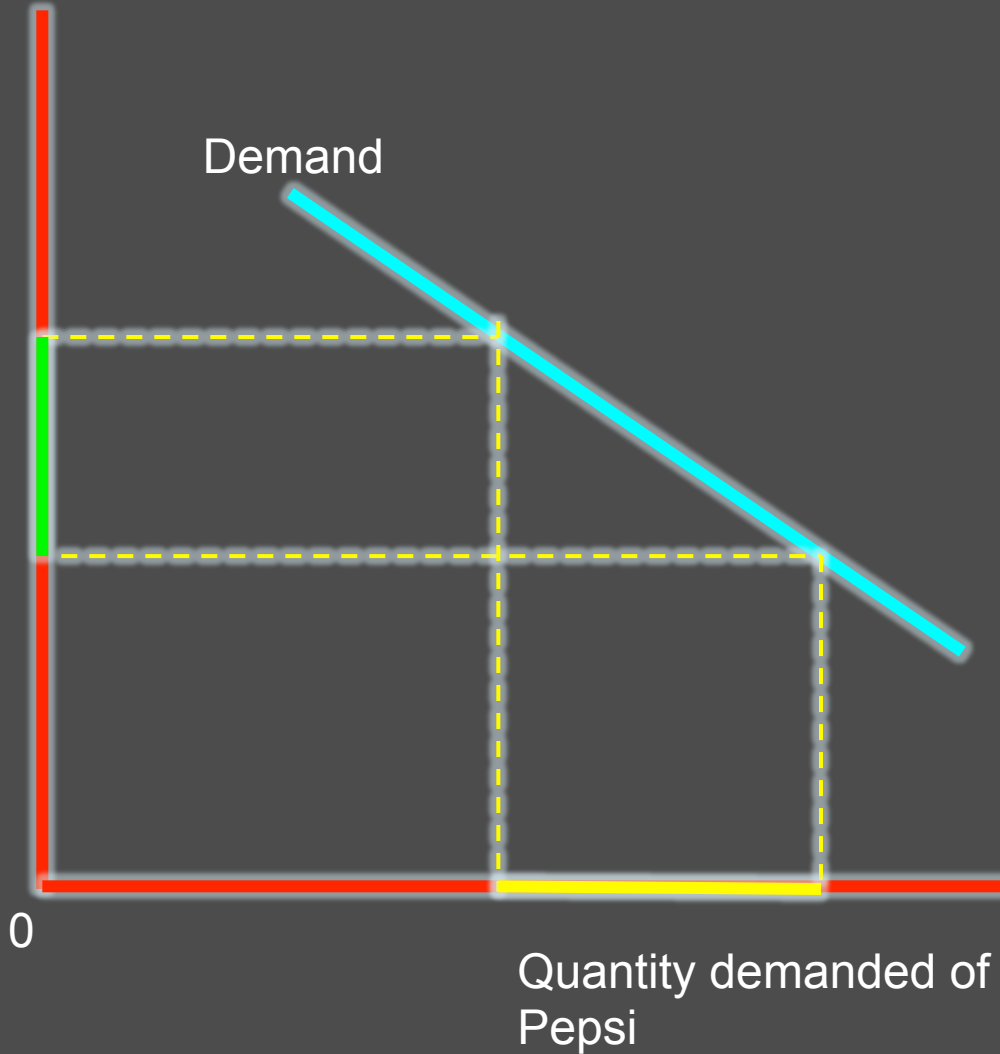


XED: Coca Cola or Pepsi?

OR You can show XED on 2 diagrams.

Price
Of
Pepsi

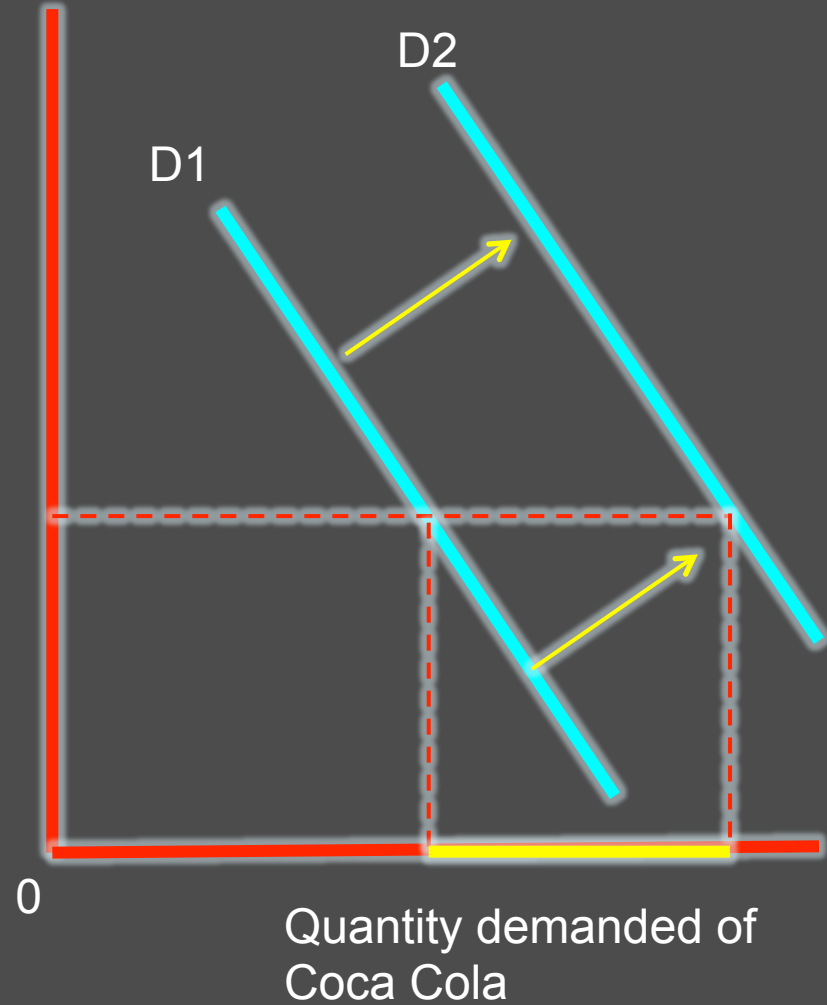
Demand



Price of Coca Cola

D2

D1



xed

Evaluate xED (useful for long essay)



- Xed allows firms to observe how changes in prices of competitor products will affect their firm or how their demand will be affected by changes in the prices of complementary products

- ❖ Xed is difficult to calculate accurately as price information may change regularly in a competitive market e.g. fresh fish and meat prices

PES

PRICE ELASTICITY OF
SUPPLY: THE SIMPLE or
POINT FORMULA

% CHANGE IN QUANTITY
SUPPLIED

% CHANGE IN PRICE

Note: Q/X of line as in diagram
1 below has a key bearing on
elasticity

IBQ for 99

Explain why the PES
for primary
commodities is
relatively low and the
PES for
manufactured goods
is relatively high.

Syllabus: item 25

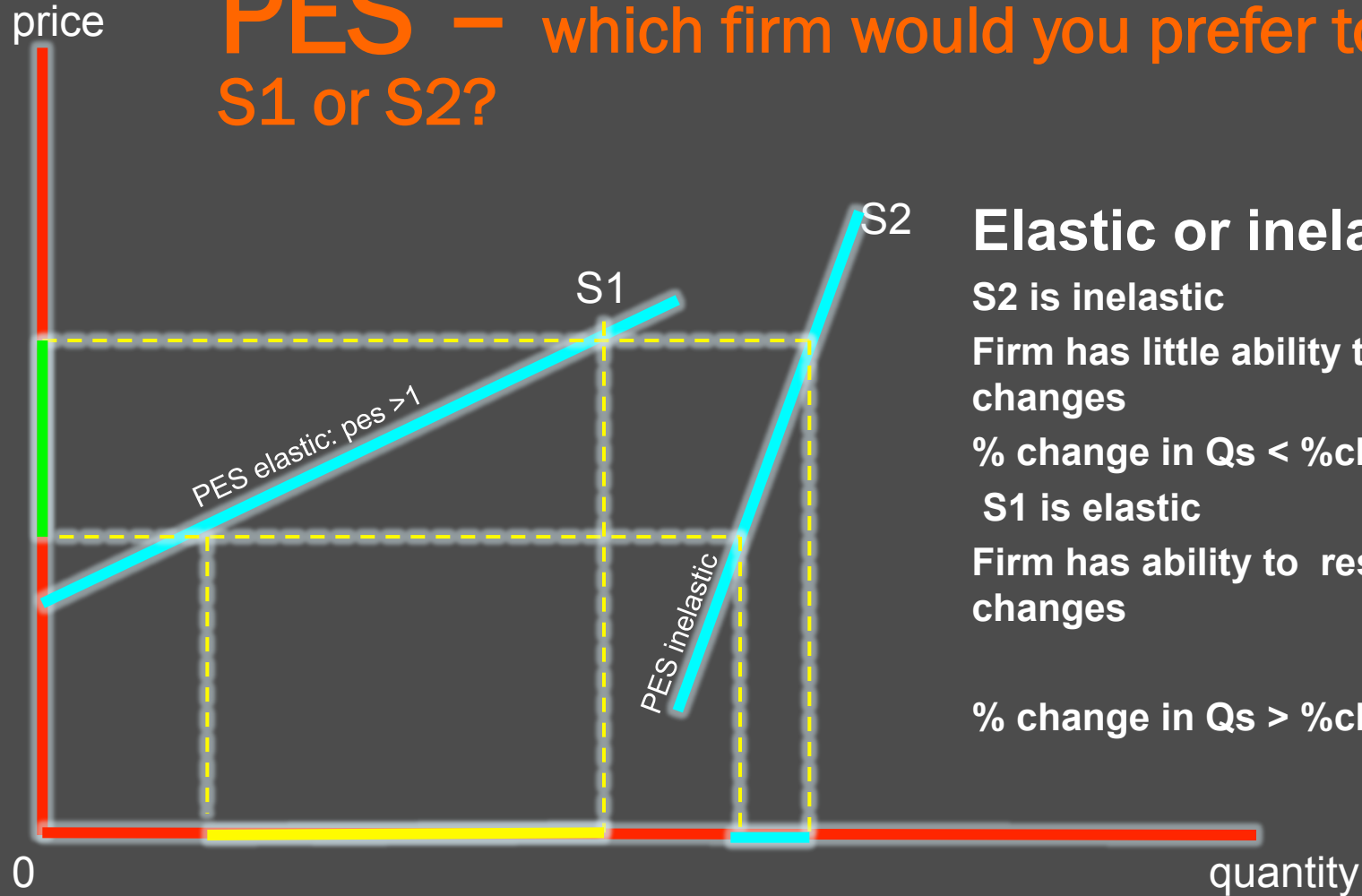
P e S

Shows ability of firms to adjust to changes in price. Firms that have elastic price elasticity of supply can benefit from sudden changes in price.

1. ELASTIC ($e > 1$)
2. INELASTIC ($e < 1$)
3. UNITARY ELASTIC
($e = 1$)

Elastic or inelastic?

PES – which firm would you prefer to own
S1 or S2?



Elastic or inelastic

S2 is inelastic

Firm has little ability to react to price changes

% change in Q_s < %change in P

S1 is elastic

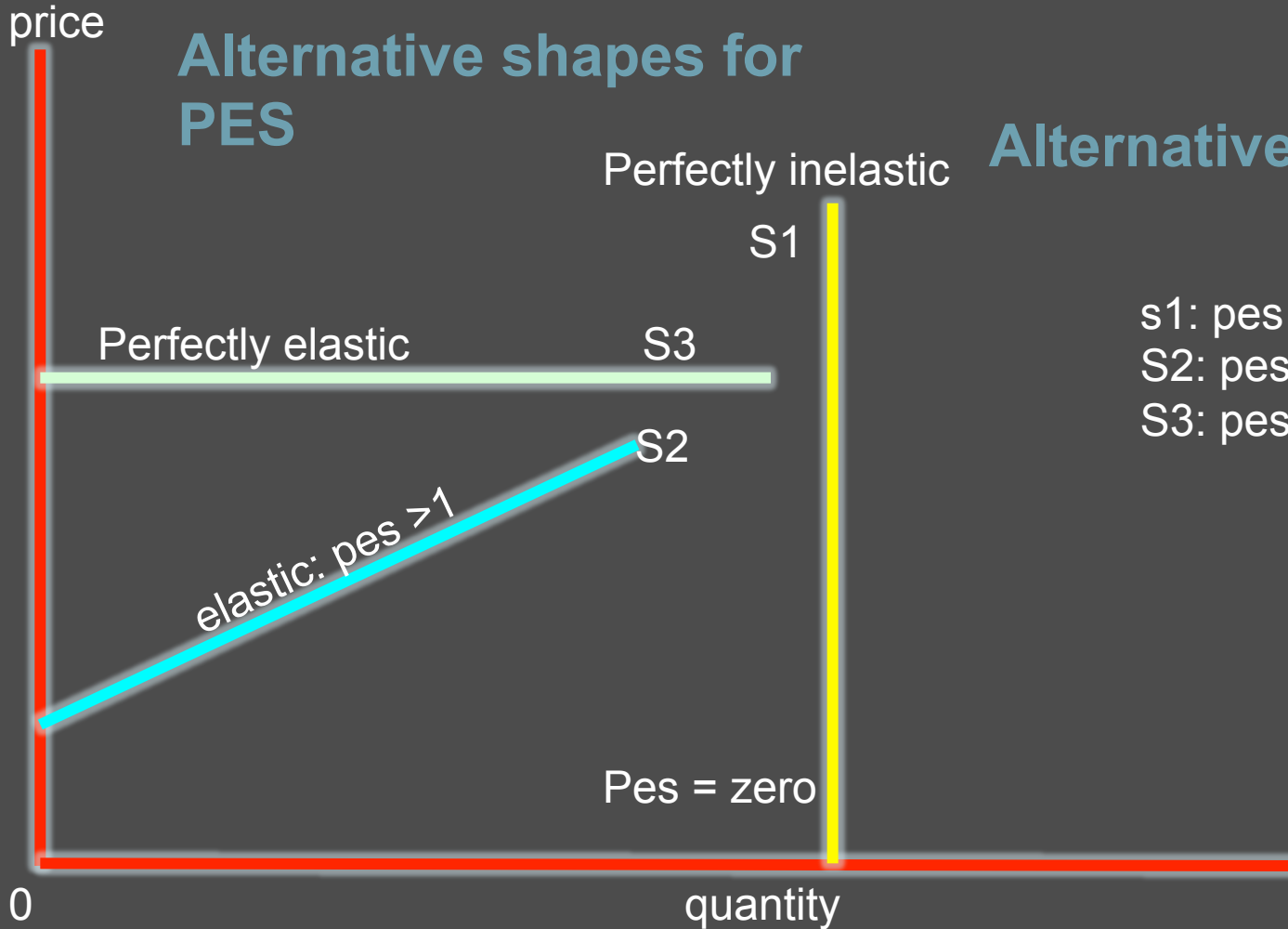
Firm has ability to respond to price changes

% change in Q_s > %change in P

s1: pes = elastic, > 1
s2: pes = inelastic, < 1

PES

Alternative shapes for PES

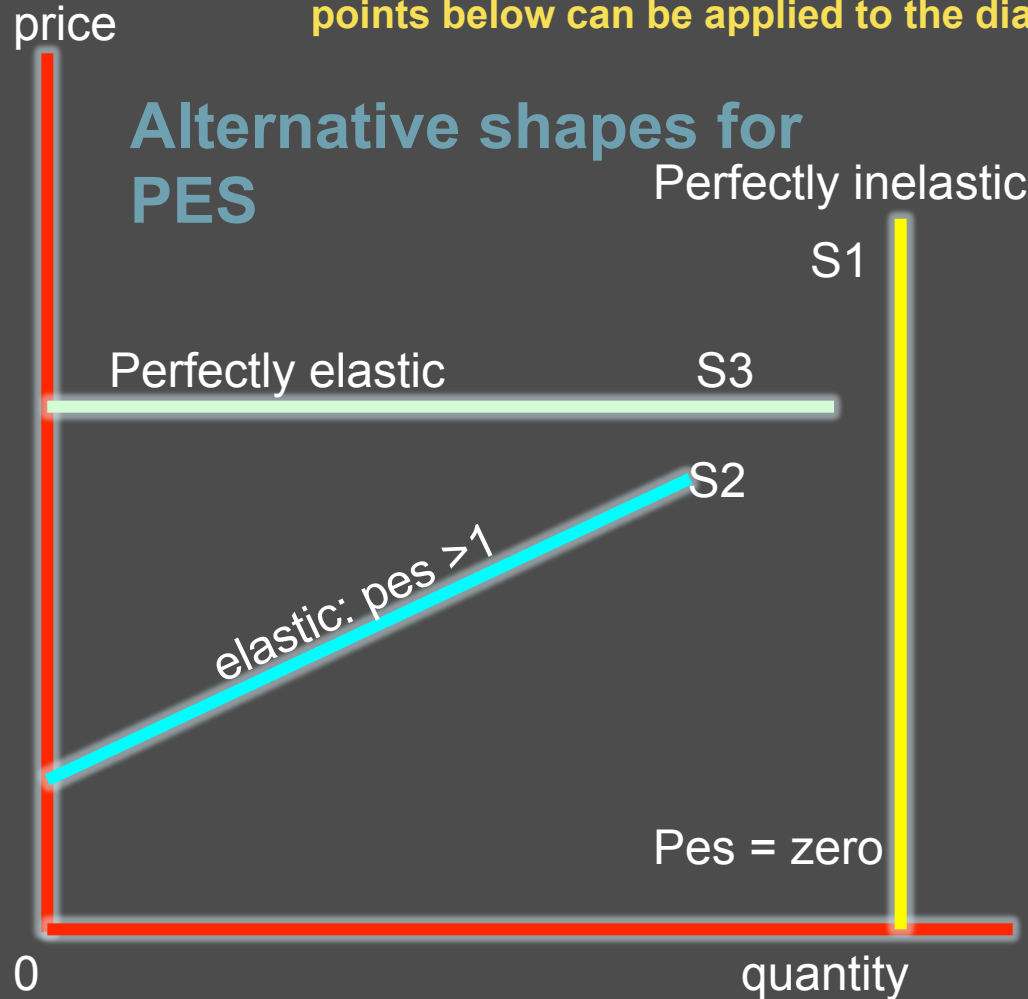


Alternative results for PES

- s1: pes = zero
- S2: pes > 1
- S3: pes = infinity

PES

Factors which influence the PES: e.g. if goods are highly perishable e.g. fresh fish then the Pes is likely to be like S 3 in diagram 2. Each of the points below can be applied to the diagram below.



1. Perishability- s1
2. Availability of substitutes: more substitutes then PES higher in value (s2)
3. Time factor: All supply is elastic over time. Time is of key importance for PES (s2) (s3)
4. Availability of stocks: more stock supply is more elastic (s2)
5. Storage costs: lower costs of storage more elastic (s2)
6. Input / FoP costs: higher costs less elastic
7. Specialised labour: shortages can affect ability to increase output (s1)
8. Spare Capacity: Farmer with unused field. No output increase in SR (s1) but Factory with unused machine can produce more manufactured goods (s2)

pes

Evaluate pes (useful for long essay)



- Firms can use Pes to plan output in the short run i.e. does firm need more factors of production in order meet increased demand from customers as prices rise?

- ❖ Pes is difficult to calculate accurately as information and results may change over time so planning for the long run will be complicated e.g. new technology may have a significant impact on how the firm produces and the level of productivity in the firm

Summary 1

Analysing Elasticity results is critical:

$P_e D$

Price elasticity allows us to classify goods whereby the results of the elasticity calculation determine one of the following:

1. **TR is key focus.**
2. **NORMAL** (p_{ed} , negative)
3. **GIFFEN** (p_{ed} , positive)
4. **ELASTIC** ($e > 1$)
5. **INELASTIC** ($e < 1$)
6. **UNITARY ELASTIC** ($e = 1$)
7. Elasticity is a key issue for LDC's.
❖ **commodities / primary goods** face price inelastic demand. This is critical for LDC's

$X_e D$

1. **SUBSTITUTES** ($X_e D$ positive)
2. **COMPLEMENTARY** ($X_e D$, negative)
3. **ELASTIC** ($e > 1$)
4. **INELASTIC** ($e < 1$)
5. **UNITARY ELASTIC** ($e = 1$)

$Y_e D$

1. **INFERIOR** (y_{ed} , negative)
See **yed 1+2**
2. **ELASTIC** ($e > 1$)
3. **INELASTIC** ($e < 1$)
4. **UNITARY ELASTIC** ($e = 1$)
5. **YED elasticity is a key issue for LDC's**
6. **commodities / primary goods** income inelastic. Necessities **such as food products**. This is critical for LDC's (**yed 3 in diagram 3, slide 3**). Increases in incomes not a great benefit for LDC's selling food.
7. **manufactured + luxury goods** tend to be income elastic (**yed 4**). DC's benefit by selling luxuries. More profits!

$P_e S$

1. Shows ability of firms to adjust to changes in price. Firms that have elastic price elasticity of supply can benefit from sudden changes in price.
2. **ELASTIC** ($e > 1$)
3. **INELASTIC** ($e < 1$)
4. **UNITARY ELASTIC** ($e = 1$)

Summary 2:

4 Elasticities: 4 stories



PeD \longrightarrow	$> 1 < 1 = 1$	\downarrow TR \uparrow
YeD "i to I"	$> 1 < 1 = 1$	+ or - (inf)
XeD \longrightarrow	$> 1 < 1 = 1$	+(sub) or - (com)
PeS \longrightarrow	$> 1 < 1 = 1$	+ or - (time)

Note: for **pes** and **ped** be sure you know the factors that make each in(elastic)
See webnote 122 for **ped** and for **pes** see slide 18 above!

4 elasticities = 4 stories

PED

Total
Revenue

YED

Inferior

XED

Complement
or Substitute

PES

Resource
allocation