Chapter 3 Elasticities

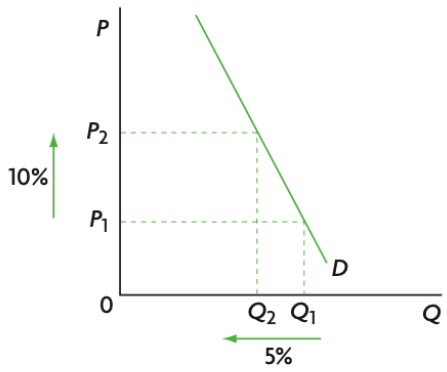
3.1 PED

A measure of the responsiveness of the quantity of a good demanded to changes in its price.

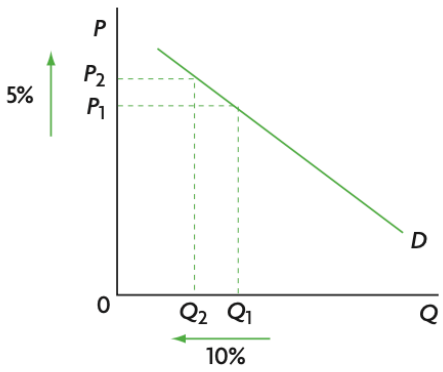
Value of *PED*	Classification	Interpretation
Frequently encountered cases		
$0 < PED < 1$ (greater than zero and less than one)	inelastic demand	quantity demanded is relatively unresponsive to price
$1 < PED < \infty$ (greater than 1 and less than infinity)	elastic demand	quantity demanded is relatively responsive to price
Special cases		
$PED = 1$	unit elastic demand	percentage change in quantity demanded equals percentage change in price
$PED = 0$	perfectly inelastic demand	quantity demanded is completely unresponsive to price
$PED = \infty$	perfectly elastic demand	quantity demanded is infinitely responsive to price

Frequently encountered cases

(a) Price inelastic demand: $0 < PED < 1$

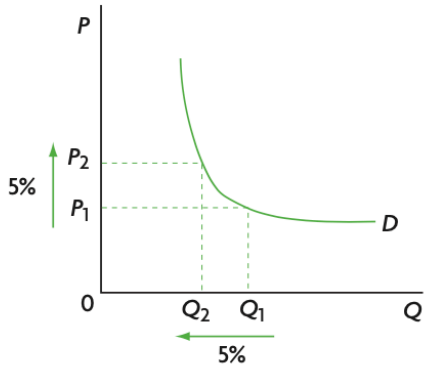


(b) Price elastic demand: $1 < PED < \infty$

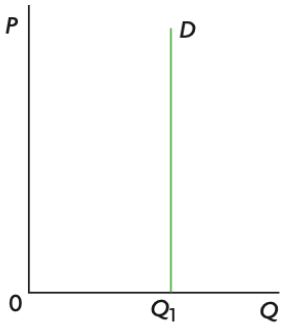


Special cases

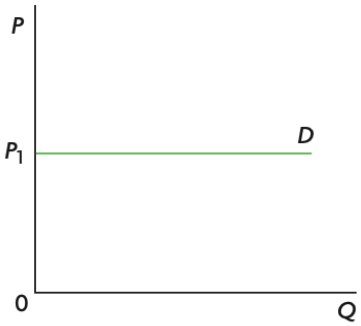
(c) Unit elastic demand: $PED = 1$



(d) Perfectly inelastic demand: $PED = 0$



(e) Pefectly elastic demand: $PED = \infty$



Determinant of PED

1. **Number and closeness of substitute.**

   Ex. Substitutability: Coco-Cola and Pepsi > Coco-Cola and orange juice.

   The narrower the definition of a good, the more the close substitutes and the more elastic the demand

   Ex. food < apple

2. **Necessities versus luxuries**

   Necessities: g/s we consider to be essential or necessary in our lives; we cannot do w/o them

   Luxury: Not necessary or essential

   Ex. Food > holiday

   Ex. Addition like alcohol, cigarettes > phones

3. **Length of time**

   ex. Heating oil:

   Short-term:

   consumers can do little to switch to other forms of heating — inelastic

   Long-term:

   switch to other heating systems (gas) or install better insulation — elastic

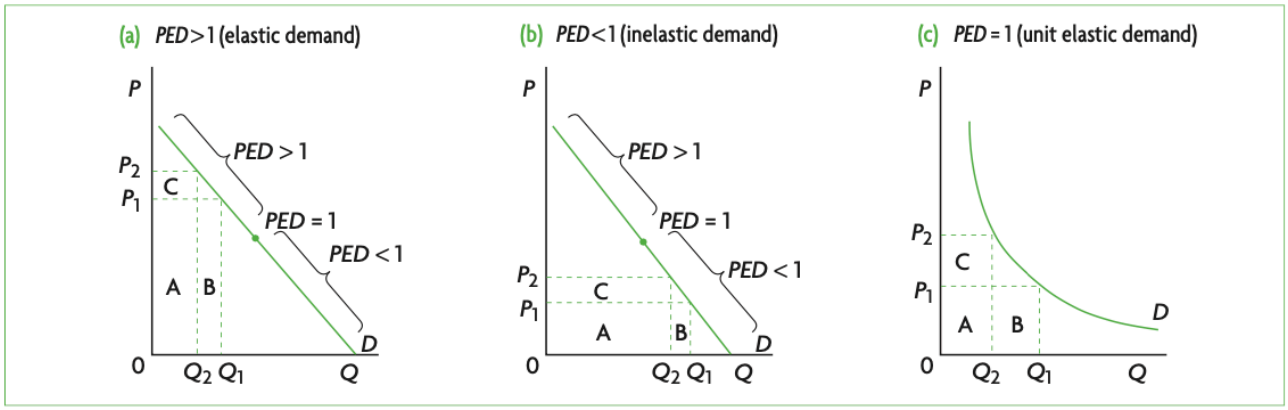
4. **Proportion of income**

   Ex. Pen < summer holidays

Application of PED

1. **Total revenue**

The amount of money received by firms when they sell g/s, TR = P × Q



Elastic, >1 : price and TR change in opposite directions

Inelastic, <1 : price and TR change in the same direction

2. Firm pricing decisions

Total revenue is at a maximum when price is at the point where demand is unit elastic.

3. Primary and manufactured products

Primary commodities are goods arising directly from the use of natural resources, or the factor of production 'land', including agricultural, fishing and forestry products, as well as products of extractive industries (oil, coal, minerals, and so on). Agricultural products include food, as well as other, non-edible commodities (such as cotton and rubber).

Primary: low *PED*

necessities and have no substitutes

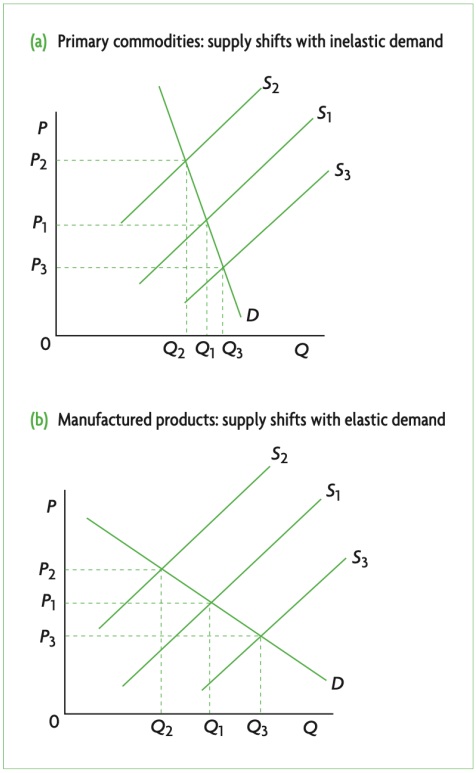
Ex. food and oil

Manufactured products: high PED

usually have substitutes.

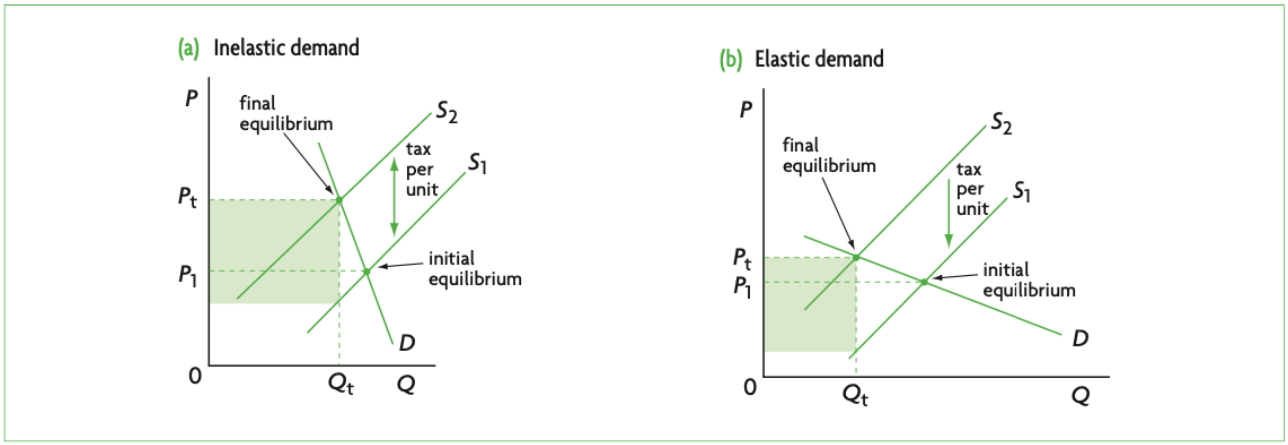
Consequence:

ironic conclusion for agricultural goods.



4. Indirect tax

Lower PED, greater government tax revenues.



3.2 XED

Measure of the responsiveness of demand for one good to a change in the price of another good; involves demand curve shifts.

Positive: substitute

Negative: complement

Zero: unrelated

Application:

1. Substitute

1. By a single business

Ex. Coco-cola and Sprite, Coco-cola company must consider the XED when making decision about prices.

2. By rival businesses

Ex. Coco-cola and Pepsi: predict the effect on the other company.

3. **Mergers**

Eliminate competition, and thus usually illegal

Ex. Google and Android

2. complementary

Businesses producing strongly complementary goods often **collaborate.**

Ex. sports clothing and sports equipment

Ex. charter flights and holiday hotels.

A fall in the price of charter flights is likely to produce a substantial increase in holiday hotel occupancy. We find airlines frequently collaborating with hotels to take advantage of such complementarities, thus increasing sales and revenues.

It is also possible to use *XED* to **estimate the impact of an indirect (excise) tax** on one good on the sales of a complementary good.

Ex. increases in gasoline (petrol) taxes can have a large impact on the demand for **large cars.**

3.3 YED

A measure of the responsiveness of demand to changes in income, and involves demand curve shifts.

> 0: normal goods

< 0: inferior goods

Ex. bus rides, second- hand clothes and used cars

< 1: inelastic, necessities

>1: elastic, luxuries

Applications of YED

1. Expansion of industries

The higher the *YED* for a good or service, the greater the expansion of its market is likely to be in the future.

Producers interested in producing in an expanding market may therefore want to know *YED*s of various goods and services.

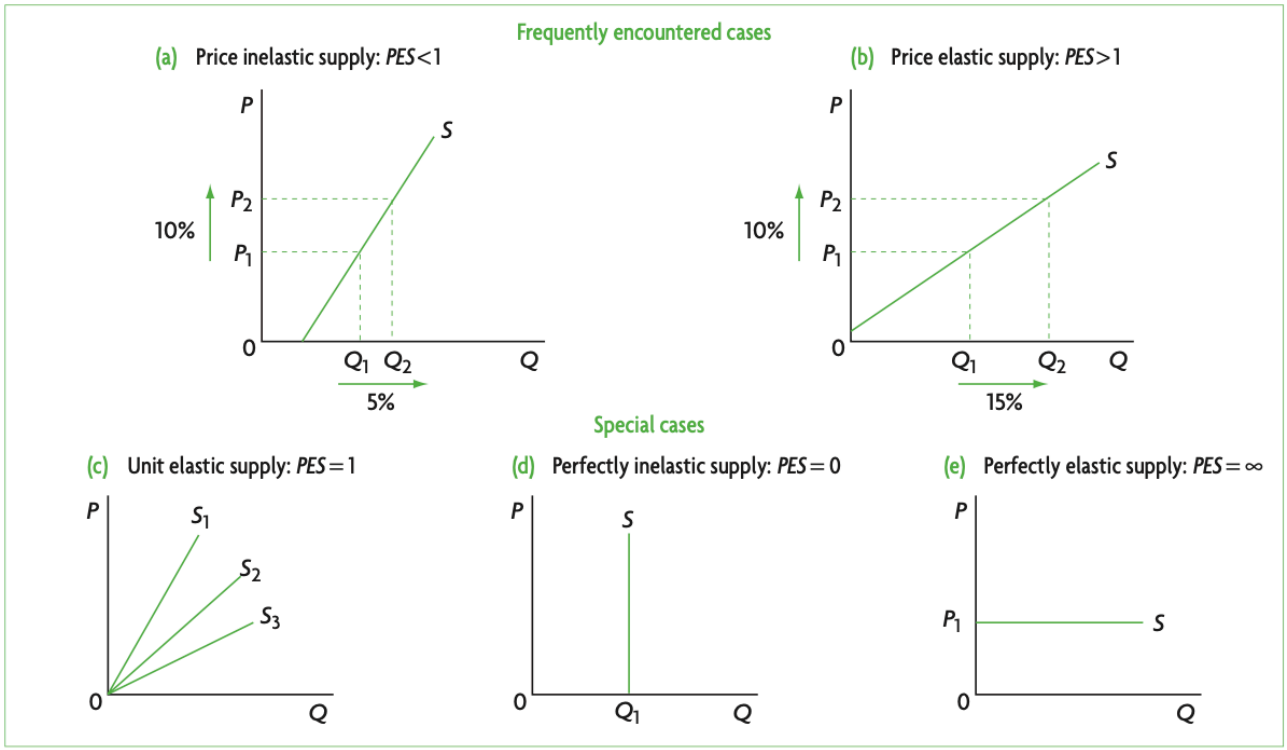
2. Economy structure

As economy grows, the share of agricultural output in total output shrinks, while the share of manufactured output grows. The services sector expands at the expense of both agriculture and manufacturing. This can be explained by YED.

Thus, while less developed countries are usually dominated by the primary sector, more developed countries are dominated by services.

3.4 PES

A measure of the responsiveness of the quantity of a good supplied to changes in its price.



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Determinants of PES

1. Length of time

Ex. Fishing boat.

Upon its return: has only so many fish to supply in the market. No response even if the price increases.

When the fishing boat can be taken out to sea more often, and more labour can be hired to fish.

2. Mobility of factors of production

the ease and speed with which firms can **shift resources and production** between different products.

3. spare/unused capacity of firms

Sometimes firms may have capacity to produce that is not being used

Ex. factories or equipment may be idle for some hours each day

4. Ability to store stocks

Can affect *PES* over relatively short periods of time.

Application of PES

1. Primary and manufactured

primary: low PES

Time need to respond, limited land, technological change required

2. Short-run, long-run

Over longer periods of time the *PES* of agricultural products is larger.