Tuesday, September 4, 2018 8:33 AM

Demand, Supply, and Changes in Market Equilibrium

Market Equilibrium may change when ... CASE

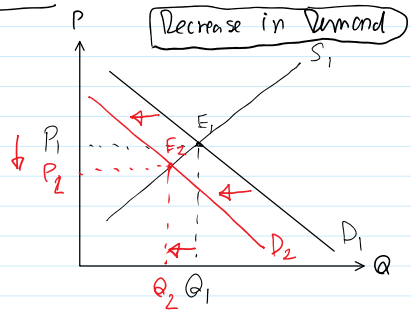
① There is a change in demand (= Demand curve shifts)
- Decrease in Demand (= Demand Curve shifts LEFT) (1A)
- Increase in Demand = (Demand Curve shifts RIGHT) (1B)

or ② There is a change in supply (= Supply curve shifts)
- Decrease in Supply (= Supply curve shifts LEFT) (2A)
- Increase in Supply (= Supply curve shifts RIGHT) (2B)

or ③ There is a change in demand and supply (= Both Demand and Supply curves shift)
- Decrease in Demand & Decrease in Supply 3A
- Increase in Demand & Increase in Supply 3B
- Decrease in Demand & Increase in Supply 3C
- Increase in Demand & Decrease in Supply 3D

CASE 1 Change in Demand

Decrease in Demand

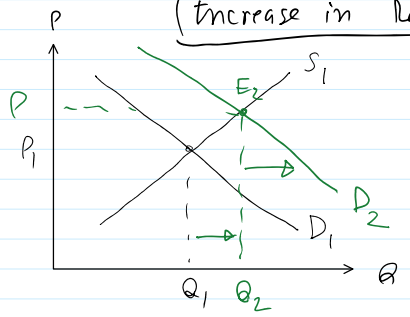


Before P_1 Q_1

After P_2 Q_2

Market Outcome: P ↓ Q ↓

Increase in Demand

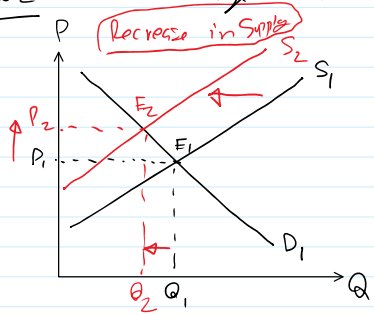


Effect on P: P ↑

Effect on Q: Q ↑

Case 2 Change in Supply

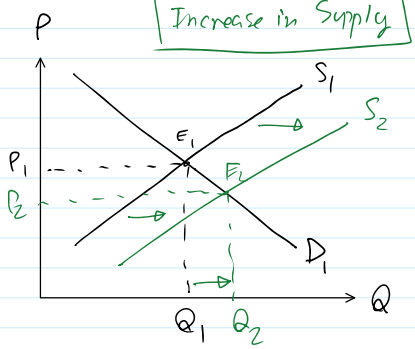
Decrease in Supply



Effect on P: P ↑

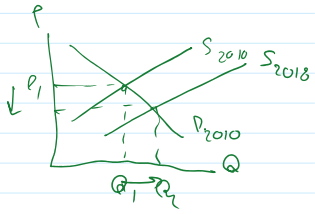
Effect on Q: Q ↓ (Market becomes less active)

Increase in Supply



Effect on P: P ↓

Effect on Q: Q ↑



3A

Effect on P:

Effect on Q

3B

3C

3D

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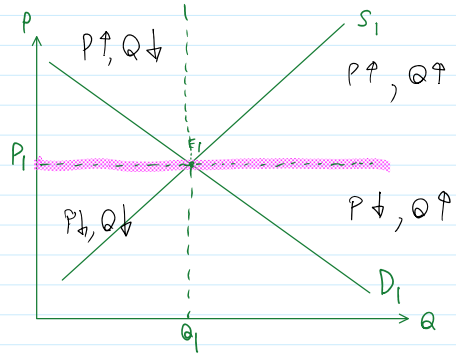


3A } Effect on P: unclear
3B } Effect on Q: clear

3C } Effect on P: clear
3D } Effect on Q: unclear

Elasticity

Law of demand tells us about "Direction" of change, i.e.,

As P_x ↑, Q^D_x ↓
and as P_x ↓, Q^D_x ↑

However, we now want to know more about "Magnitude" of change, i.e.,

For example, If price of x ↑ by 10%, quantity demanded for x will ↓ by ? %

- fall more than 10%.
- fall less than 10%. or
- fall by 10% or

Elasticity: responsiveness of a variable you are interested in to a change in another variable

$$E = \frac{\%\Delta Y}{\%\Delta X}$$

→ percentage change in Y

→ percentage change in X

For example,

- if 10% change in x leads to 50% change in Y,

$$E = \frac{50\%}{10\%} = 5 > 1$$

Y is quite sensitive to a change in X.

- If 10% change in x leads to 1% change in Y,

$$E \quad \frac{1\%}{10\%} = 0.1 < 1$$

Y is not so sensitive to a change in X.

Note

$\frac{\Delta Y}{\Delta X}$ → this is about "absolute change"

$\frac{\%\Delta Y}{\%\Delta X}$ → this is about "percentage change"

Now we apply this concept to Economics.

Price Elasticity of Demand (E^P)

Q^D_x, P_x

Q^D_x → treated as variable on the top

P_x → treated as variable at the bottom

$$E = \frac{\%\Delta Y}{\%\Delta X}$$

$$E^P = \frac{\%\Delta Q^D_x}{\%\Delta P_x}$$

recipe for computing Price Elasticity of Demand.

Case 1 If $|\%\Delta Q^D_x| > |\%\Delta P_x|$, then $|E^P| > 1$

EXAMPLE if price of x rises by 10%, Q^D_x falls by 50%

EXAMPLE if price of x rises by 10%, Q_x^D falls by 50%

$$E^P = \frac{\%\Delta Q_x^D}{\%\Delta P_x} = \frac{-50}{+10} = -5 \quad \text{or} \quad |E^P| = |-5| = 5 > 1$$

We then say that Demand for good x is price-elastic.

(i.e, buyers are price-sensitive.)

Case 2 IF $|\%\Delta Q_x^D| < |\%\Delta P_x|$, then $|E^P| < 1$

Example if price of x rises by 10%, Q_x^D falls slightly by 2%

$$E^P = \frac{\%\Delta Q_x^D}{\%\Delta P_x} = \frac{-2}{+10} = -0.2 \quad \text{or} \quad |E^P| = |-0.2| = 0.2 < 1$$

We then say that Demand for good x is price-inelastic,

Case 3 IF $|\%\Delta Q_x^D| = |\%\Delta P_x|$, then $|E^P| = 1$

EX. IF price of x rises by 10%, Q_x^D falls by 10%

$$E \quad \frac{\%\Delta Q_x^D}{\%\Delta P_x} = \frac{-10}{+10} = -1 \quad \text{or} \quad |E^P| = |-1| = 1$$

We say that Demand For good x is price-unitary elastic.

Case 4 IF $|\%\Delta Q_x^D| = 0$ for any $|\%\Delta P_x|$, then $|E^P| =$

$$E^P = \frac{\%\Delta Q_x^D}{\%\Delta P_x} = \frac{0}{\text{any }\%} = 0$$

We say that demand for good x is perfectly price-inelastic.

(i.e, Buyers pay no attention on price change)

Case 5 IF $\%\Delta Q_x^D$ is very very very BIG for a very very very small $\%\Delta P_x$, then

$$E^P = \frac{\%\Delta Q_x^D}{\%\Delta P_x} \quad \frac{\text{BIG}}{\text{small}} = \text{VERY VE}$$

Then we say that Demand For good x is perfectly price-elastic.

called

perfectly price inelastic

price elastic

y BIG

infinity

called

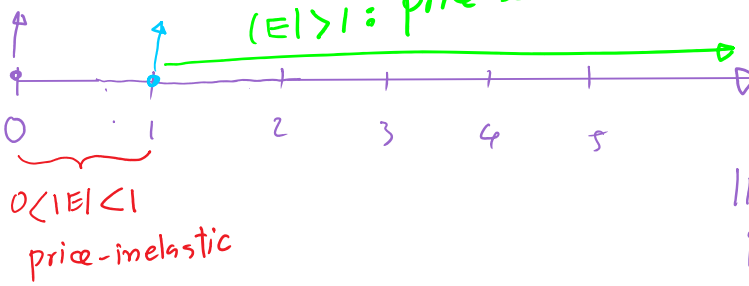
perfectly price-elastic.

$(|E^P| = \infty)$

$|E|=0$: perfectly price inelastic

$|E|=1$: unit-price elastic

$|E|>1$: price-elastic



$|E^P| = \left|\frac{\%\Delta Q}{\%\Delta P}\right|$

$0<|E|<1$
price-inelastic

$|E|=\infty$
perfectly price-elastic

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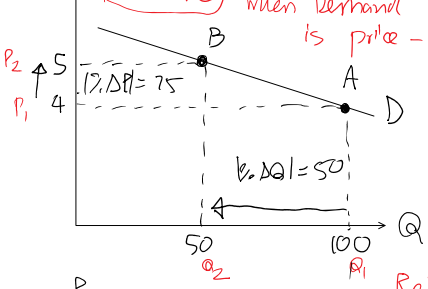
Variety of Demand Curves

Key point: Shape of a demand curve tells us about buyers' price sensitivity or price responsiveness.

$E^P = \frac{\%\Delta Q}{\%\Delta P}$

Relatively flat Demand curve when Demand for X is price-elastic

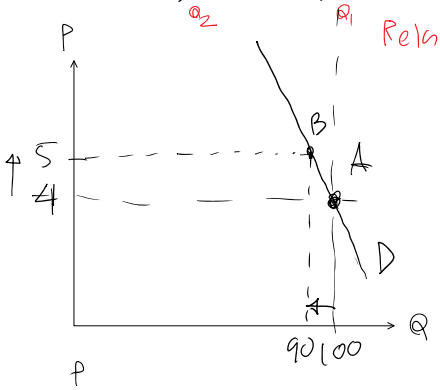


$\%\Delta Q = \frac{Q_2 - Q_1}{Q_1} \times 100 = \frac{50-100}{100} \times 100 = -50$

$\%\Delta P = \frac{P_2 - P_1}{P_1} \times 100 = \frac{5-4}{4} \times 100 = +25$

$E^P = \frac{-50}{+25} = -2$ or $|E^P| = 2 > 1$

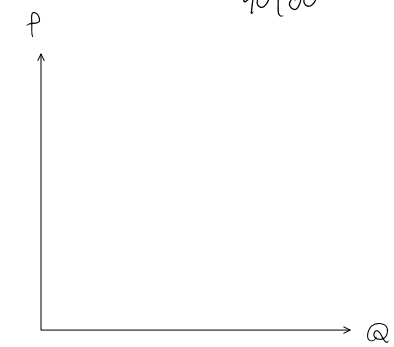
Relatively steep demand curve when demand for good x is price-inelastic.

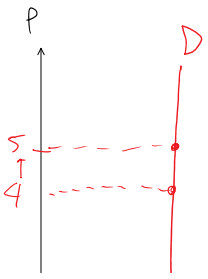


$\%\Delta P = +25$

$\%\Delta Q = \frac{Q_2 - Q_1}{Q_1} \times 100 = \frac{90-100}{100} \times 100 = -10$

$E^P = \frac{-10}{+25} = -0.4$ or $|E^P| = 0.4 < 1$

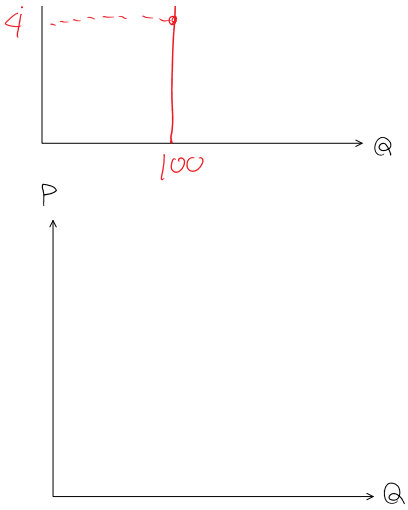




- Shape: Vertical
- $E^P = \frac{\%\Delta Q}{\%\Delta P} = \frac{0}{+25} = 0$
- Demand is perfectly price-inelastic.
- consumers' price sensitivity → none

infinity

Note
ignore
e sign
care about
e magnitude



- Demand is perfectly price-inelastic.
  - consumers' price sensitivity ⇒ none