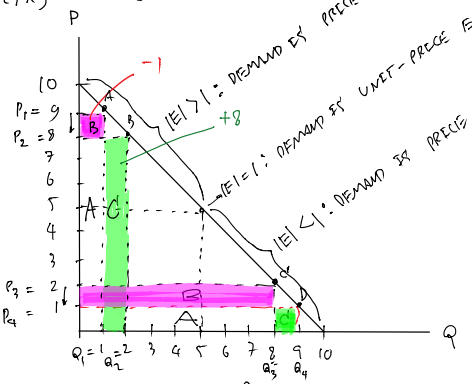
PRICE ELASTICITY OF DEMAND & TOTAL REVENUE

PRICE (P)	QUANTITY (Q)	TOTAL REVENUE (TR)
10	0	0
9	1	9
8	2	16
7	3	21
6	4	24
5	5	25
4	6	24
3	7	21
2	8	16
1	9	9
0	10	0

$P = 10 - Q$



FROM A → B : $P_1 = 9$, $Q_1 = 1$ ⇒ $TR_1 = P_1 \times Q_1 = 9 \times 1 = 9$ $(= A+B)$

$P_2 = 8$, $Q_2 = 2$ ⇒ $TR_2 = P_2 \times Q_2 = 8 \times 2 = 16$ $(= A+C)$

$\Delta TR = TR_2 - TR_1 = 16 - 9 = 7$ ☺

$\Delta TR = (A+C) - (A+B) = +C - B > 0$

AREA B = LOSS IN REVENUE DUE TO LOWERING PRICE (PRICE EFFECT)

AREA C = GAIN IN REVENUE DUE TO HIGHER SALES (QUANTITY EFFECT)

AS QUANTITY EFFECT ($+8$) > PRICE EFFECT (-1), SO TR INCREASES ☺

WHEN D IS PRICE-ELASTIC ($|E|>1$), ↓ P → TR ↑. ☺ — (1)

FROM C → D WHAT WILL HAPPEN TO HIS TR WHEN HE LOWERS THE PRICE?

AT $P_3 = 2$, $Q_3 = 8$ AND $TR_3 = P_3 \times Q_3 = 2 \times 8 = 16$

AT $P_4 = 1$, $Q_4 = 9$ AND $TR_4 = P_4 \times Q_4 = 1 \times 9 = 9$ ⟩ -7

$\Delta TR = TR_4 - TR_3 = 9 - 16 = -7$

$\Delta TR = (A+C') - (A+B) = -B + C' < 0$

HERE, AS BAD CONSEQUENCE OF PRICE EFFECT > GOOD CONSEQUENCE OF QUANTITY EFFECT,

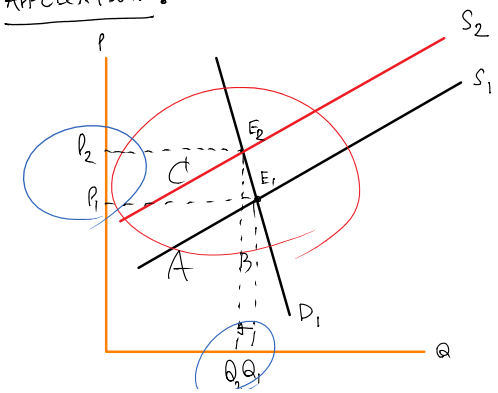
THEN TOTAL REVENUE DECREASES. ☹

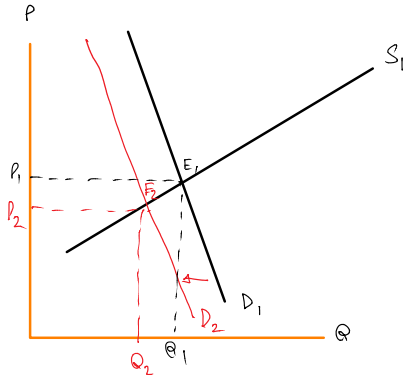
WHEN D IS PRICE-INELASTIC, ↓ P → TR ↓ ☹ — (2)

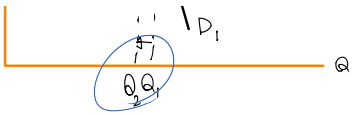
FROM B → A

FROM D → C'

APPLICATION :





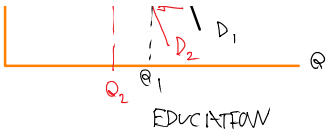


WAR AGAINST DRUG

$P_1 \times Q_1 = A + B$

$P_2 \times Q_2 = A + C$

SINCE $C > B$, THEN TOTAL EXPENDITURE ON DRUGS ↑.



EDUCATION

TOTAL EXPENDITURE ON DRUGS REDUCES FROM $P_1 \times Q_1$ TO $P_2 \times Q_2$.

DRUG-RELATED CRIMES ↓

FACTORS THAT DETERMINE PRICE ELASTICITY OF DEMAND

EX1: CONSIDER PRICE CRACKER Vs. SUNSCREEN

SUPPOSE PRICES OF THE TWO GOODS RISE BY 20%, WHICH GOOD Q^D WILL DROPS THE MOST?

ANSWER PRICE CRACKERS

LESSON LEARNED: PRICE ELASTICITY OF DEMAND IS HIGHER WHEN CLOSE SUBSTITUTES ARE AVAILABLE!

EX2 CONSIDER INSULIN Vs. LUXURY CARS

SUPPOSE _____

ANSWER LUXURY CARS

LESSON LEARNED: PRICE ELASTICITY OF DEMAND IS HIGHER FOR LUXURY GOODS THAN FOR NECESSITY GOODS.

EX3 CONSIDER "BLUE JEANS" Vs. "CLOTHING"

SUPPOSE PRICE OF THE TWO GOODS RISE BY 20%, WHICH GOOD Q^D WILL DROP THE MOST?

ANSWER

LESSON LEARNED: PRICE ELASTICITY OF DEMAND IS HIGHER FOR NARROWLY DEFINED GOODS THAN FOR BROADLY DEFINED GOODS.

EX. 4 CONSIDER "GASOLINE IN THE SHORT RUN Vs "GASOLINE IN THE LONG RUN"

SUPPOSE THE PRICE OF GASOLINE RISES BY 20%, DOES Q^D DROP MORE IN THE SHORT RUN OR IN THE LONG RUN?

ANSWER

ANSWER

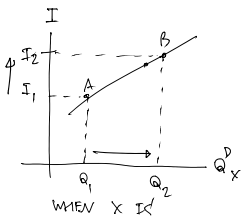
LESSON LEARNED? PRICE ELASTICITY OF DEMAND IS HIGHER IN THE LONG RUN THAN IN THE SHORT RUN.

OTHER ELASTICITIES

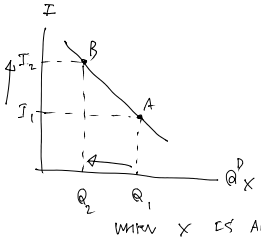
INCOME ELASTICITY OF DEMAND (E^I) = $\frac{\%\,\Delta Q^D_X}{\%\,\Delta I}$

$Q^D_X = f(P_X, I, P_Y, \dots)$ → E^P, E^I, E^C

- FOR NORMAL GOODS, $E^I > 0$ (POSITIVE)
  - $0 < E^I \leq 1$ (NECESSITIES): $\%\Delta Q^D_X < \%\Delta I$
    - EX: I FALLS BY 10%, Q^D_X FALLS BY LESS THAN 10%, LET'S SAY 2%.
    - $E^I = \frac{-2}{-10} = 0.2 < 1$
  - $E^I > 1$ (LUXURIES): $\%\Delta Q^D_X > \%\Delta I$
    - EX: I FALLS BY 10%. Q^D_X FALLS BY 50%, LET'S SAY.
    - $E^I = \frac{-50}{-10} = 5.0 > 1$
- FOR INFERIOR GOODS, $E^I < 0$ (NEGATIVE)



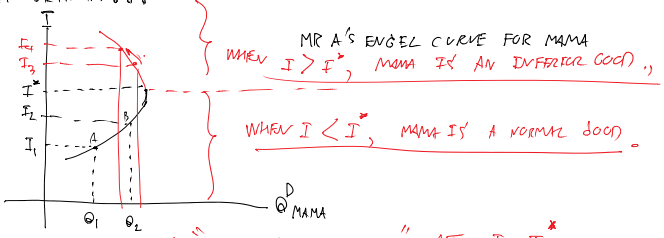
WHEN X IS A NORMAL GOOD, ENGEL CURVE IS POSITIVELY SLOPED.
WHEN I ↑, Q^D_X ↑ (A → B)
AND WHEN I ↓, Q^D_X ↓ (B → A)



WHEN X IS AN INFERIOR GOOD ENGEL CURVE IS NEGATIVELY SLOPED!
WHEN I ↑, Q^D_X ↓
AND WHEN I ↓, Q^D_X ↑

Q: IS MAMA AN INFERIOR GOOD?

A: IT DEPENDS...



MR A'S ENGEL CURVE FOR MAMA
WHEN $I > I^*$, MAMA IS AN INFERIOR GOOD.
WHEN $I < I^*$, MAMA IS A NORMAL GOOD.

ENGEL CURVE IS "BENDING BACKWARD" AT $I = I^*$

CROSS-PRICE ELASTICITY OF DEMAND (E^C) = $\frac{\%\,\Delta Q^D_X}{\%\,\Delta P_Y}$

- \+ IF X & Y ARE "SUBSTITUTES"
- − IF X & Y ARE "COMPLEMENTS"

SUMMARY

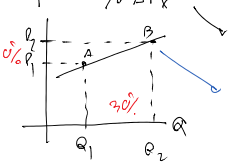
$E^I = \frac{\%\Delta Q^D_X}{\%\Delta P_X}$ $\quad E^I = \frac{\%\Delta Q^D_X}{\%\Delta I}$ $\quad E^C = \frac{\%\Delta Q^D_X}{\%\Delta P_Y}$

NEXT, PRICE ELASTICITY OF SUPPLY (E^S) = $\frac{\%\,\Delta Q^S_X}{\%\,\Delta P_X}$

- → PERCENTAGE CHANGE IN QUANTITY SUPPLIED OF GOOD X
- → PERCENTAGE CHANGE IN PRICE OF GOOD X

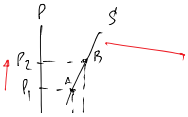
① $E^S > 1$ (i.e., $\%\Delta Q^S_X > \%\Delta P_X$)

SUPPLY IS (OF GOOD X) PRICE-ELASTIC



ELASTIC SUPPLY CURVE (RELATIVELY FLAT)

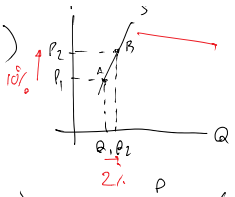
② $E^S < 1$ (i.e., $\%\Delta Q^S_X < \%\Delta P_X$)



INELASTIC SUPPLY CURVE (RELATIVELY STEEP)

③ $E^S < 1$ (i.e., $\%\Delta Q_x^S < \%\Delta P_x$)

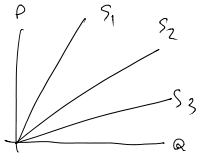
SUPPLY IS PRICE-INELASTIC



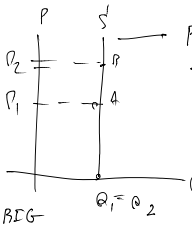
INELASTIC SUPPLY CURVE (RELATIVELY STEEP)

③ $E^S = 1$ (i.e., $\%\Delta Q_x^S = \%\Delta P_x$)

SUPPLY IS UNITARY PRICE-ELASTIC



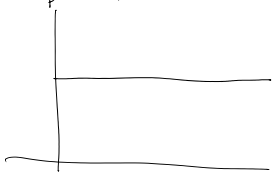
④ $E^S = 0$ (i.e., $\%\Delta Q_x^S = 0$ FOR ANY $\%\Delta P_x$)



PERFECTLY INELASTIC SUPPLY CURVE

(SHAPE: VERTICAL)

⑤ $E^S = \infty$ (i.e., $\%\Delta Q_x^S \to$ VERY VERY BIG FOR VERY VERY SMALL $\%\Delta P_x$)



PERFECTLY ELASTIC SUPPLY CURVE

(SHAPE: HORIZONTAL)

$E^S = \dfrac{\%\Delta Q_x^S}{\%\Delta P_x} = \dfrac{\%\Delta Q}{\%\Delta P} = \dfrac{\frac{Q_2 - Q_1}{Q_1} \times 100}{\frac{P_2 - P_1}{P_1} \times 100} = \dfrac{\frac{\Delta Q}{Q} \times 100}{\frac{\Delta P}{P} \times 100} = \dfrac{\Delta Q}{\Delta P} \cdot \dfrac{P}{Q}$

$$E^S = \frac{1}{\text{SLOPE}} \cdot \frac{P}{Q}$$