APPLIED ECONOMICS FOR MANAGERS: SESSION 4

I. SUPPLY AND DEMAND: THE BASICS

A. SUPPLY AND DEMAND DETERMINE EQUILIBRIUM PRICE AND QUANTITY

B. DEMAND CURVE:

1. SCHEDULE INDICATING TOTAL AMOUNT WILLINGLY BOUGHT AT EACH ALTERNATIVE PRICE (START WITH *P* AXIS READ OVER TO CURVE AND DOWN TO *Q* AXIS)

2. SCHEDULE INDICATING MARGINAL VALUE OR VALUE OF LAST UNIT CONSUMED (START WITH *Q* AXIS READ UP TO CURVE AND OVER TO *P* AXIS)

3. SENSITIVITY OF QUANTITY DEMANDED TO PRICE MEASURED BY ELASTICITY OF DEMAND:

$$\varepsilon_D = -\frac{\Delta Q/Q}{\Delta P/P} = -\frac{P}{Q}\frac{1}{\text{SLOPE}}$$

C. SUPPLY CURVE

1. SCHEDULE INDICATING TOTAL AMOUNT WILLINGLY BROUGHT TO MARKET AT EACH ALTERNATIVE PRICE (START WITH *P* AXIS READ OVER TO CURVE AND DOWN TO *Q* AXIS)

2. SCHEDULE INDICATING MARGINAL COST OR COST OF PRODUCING THE LAST UNIT PRODUCED (START WITH *Q* AXIS READ UP TO CURVE AND OVER TO *P* AXIS)

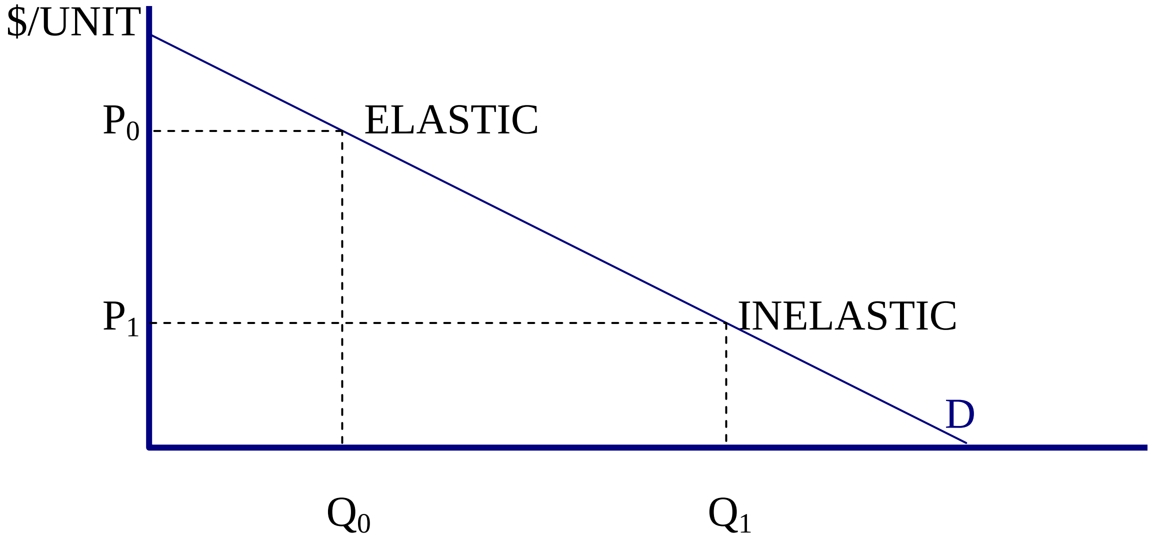
3. SENSITIVITY OF QUANTITY SUPPLIED TO PRICE MEASURED BY ELASTICITY OF SUPPLY:

ELASTICIY OF SUPPLY: $\eta_s = \dfrac{\Delta Q/Q}{\Delta P/P} = \dfrac{P}{Q}\dfrac{1}{\text{SLOPE}}$

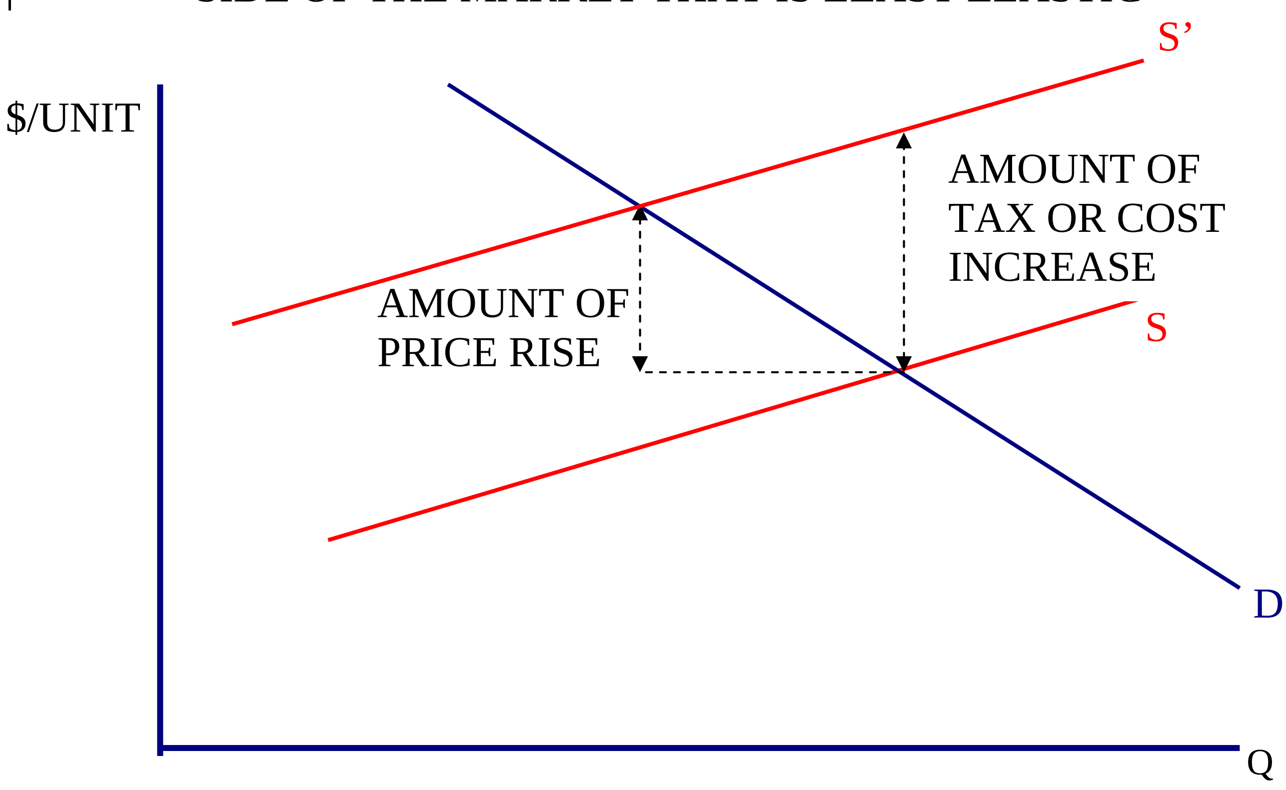
D. DEMAND SHOCKS MOVE EQUILIBRIUM PRICE AND QUANTITY IN THE SAME DIRECTION

E. SUPPLY SHOCKS MOVE EQUILIBRIUM PRICE AND QUANTITY IN OPPOSITE DIRECTIONS

FOR LINEAR CURVE, ELASTICITY IS DIFFERENT AT DIFFERENT POINT OVER THE CURVE



EFFECTS OF A SHOCK FALL MOST HEAVILY ON THE SIDE OF THE MARKET THAT IS LEAST ELASTIC



II. THE FORMAL THEORY OF CONSUMER BEHAVIOR

A. UTILITY THEORY

1. TOTAL UTILITY VS MARGINAL UTILITY
2. DIMINISHING MARGINAL UTILITY

B. BUDGET CONSTRAINTS AND UTILITY MAXIMIZATION

1. FORMAL STATEMENT OF THE CONSUMER'S PROBLEM:
   a. CHOOSE A COLLECTION OF GOODS & SERVICES—QUANTITIES OF X_1, X_2, . . . X_N THAT MAXIMIZES UTILITY
   b. SUBJECT TO THE BUDGET CONSTRAINT: $B \geq P_1X_1 + P_2X_2 + \ldots + P_NX_N$
2. THE SOLUTION:
   a. SPEND THE ENTIRE BUDGET: $B = P_1X_1 + P_2X_2 + \ldots + P_NX_N$
   b. SATISFY THE EQUI-MARGINAL PRINCIPLE:

$$\frac{MU_1}{P_1} = \frac{MU_2}{P_2} = \quad . \quad . \quad . \quad = \frac{MU_N}{P_N}$$

C. THE LOGIC OF THE EQUIMARGINAL PRINCIPLE

1. CONSUME A LITTLE LESS OF SAY X_1, I.E., GIVE UP ΔX_1

   $\Rightarrow$ SAVINGS OF $P_1\Delta X_1$

   $\Rightarrow$ LOSS OF UTILITY OF $MU_1\Delta X_1$

2. CAN NOW CONSUME MORE OF X_2. HOW MUCH MORE?

   NEW EXPENDITURE ON X_2 = AMOUNT SAVED = $P_1\Delta X_1$

   $\Rightarrow$ AMOUNT OF X_2 BOUGHT = $\Delta X_2 = \frac{P_1\Delta X_1}{P_2}$

   $\Rightarrow$ GAIN IN UTILITY IS $MU_2\Delta X_2$

3. IF INITIAL BUNDLE WAS BEST, UTILITY SHOULD ***NOT*** RISE

$$\Rightarrow MU_2\Delta X_2 = MU_2\frac{P_1\Delta X_1}{P_2} = MU_1\Delta X_1 \Rightarrow \frac{MU_2}{P_2} = \frac{MU_1}{P_1} \Rightarrow P_1 = \frac{MU_1}{MU_2}P_2$$

D. SOME IMPLICATIONS OF UTILITY THEORY

1. DEMAND CURVES SLOPE DOWNWARD

$$\frac{MU_1}{P_1} = \frac{MU_2}{P_2} = \quad . \quad . \quad . \quad = \frac{MU_N}{P_N}$$

a. A RISE IN P_1 REQUIRES MU_1 TO RISE, TOO

b. MU_1 ONLY RISES IF X_1 FALLS DUE TO DIMINISHING MARGINAL UTILITY

2. NO MUTUALLY BENEFICIAL TRADES BETWEEN CONSUMERS LEFT

3. PRICE MEASURES VALUE AT THE MARGIN

$$\Rightarrow P_1 = \frac{MU_1}{MU_2} P_2$$

IF MU_1 3 TIMES MU_2, THEN A UNIT OF X_1 IS WORTH 3 UNITS OF X_2 AT THE MARGIN, I.E., $P_1 = 3P_2$

III. PRODUCER BEHAVIOR

A. OBJECTIVE: PROFIT MAXIMIZATION, I.E., MAXIMIZE THE DIFFERENCE BETWEEN REVENUE AND COSTS, R(Q) – C(Q)

B. REVENUE: PRICE TIMES QUANTITY = PQ

1. TOTAL REVENUE

2. MARGINAL REVENUE

C. COST CONCEPTS

1. TOTAL COST = TC(Q)

2. AVERAGE COST = $\frac{TC(Q)}{Q}$

3. MARGINAL COST = $\frac{\Delta TC(Q)}{\Delta Q} = \frac{dTC}{dQ}$

D. NECESSARY CONDITION FOR PROFIT MAXIMIZATION:
MARGINAL REVENUE = MARGINAL COST

F. SUPPLY CURVE FOR THE COMPETITIVE INDUSTRY

1. P = MC FOR EACH FIRM

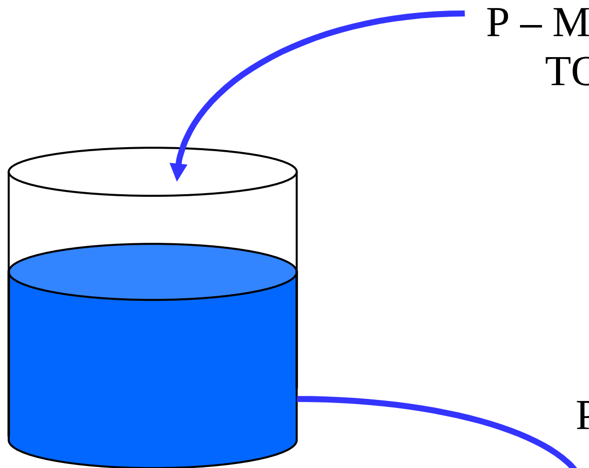
2. AT ANY GIVEN P, DETERMINE Q THAT LEADS TO MC EQUAL TO THAT PRICE AT EACH FIRM

3. ADD OUTPUT OF EACH FIRM TOGETHER TO GET TOTAL INDUSTRY OUTPUT AT THAT PRICE

4. REPEAT FOR OTHER PRICE LEVELS

INTUITION: PROFIT EARNED ON ANY UNIT IS P – MC OF THAT UNIT

$P - MC > 0$, $q_0 + 1$ UNIT ADDS TO PROFIT POOL



$P - MC < 0$, $q_0 + 1$ UNIT TAKES AWAY FROM PROFIT POOL

PROFIT POOL FROM 1^{ST} q_0^{TH} UNITS

PIZZA CONSUMPTION AND TOTAL VS MARGINAL UTILITY