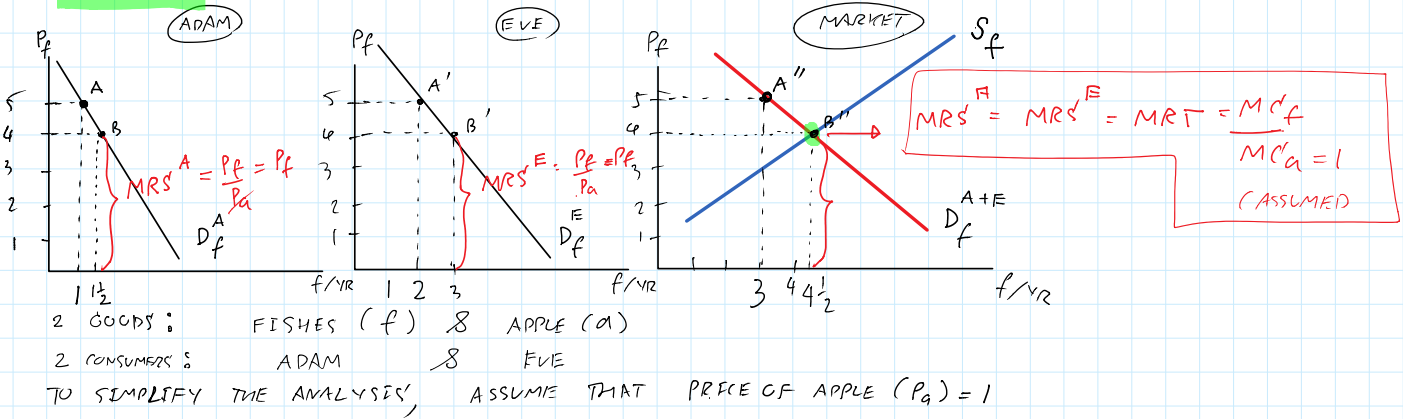


THE DEMAND FOR A PURE PUBLIC GOOD

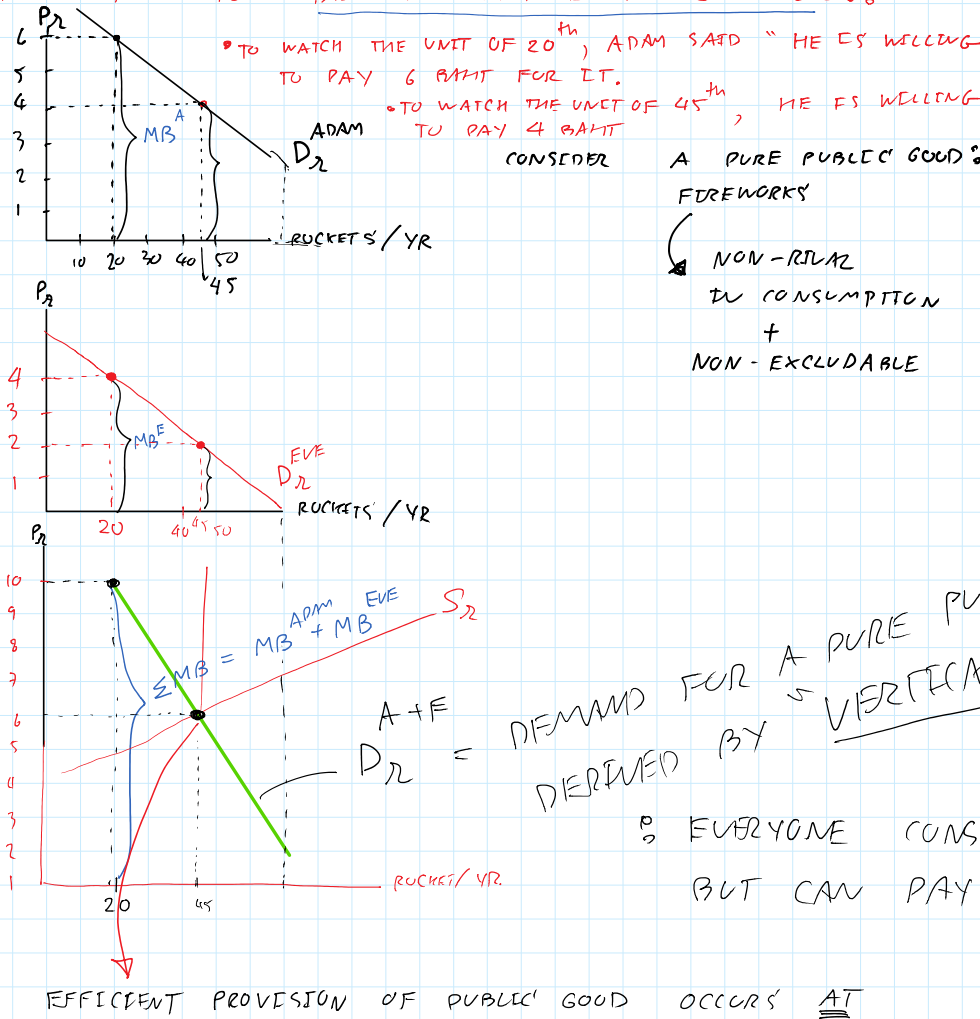
FIRST, RECALL THAT WHEN WE WOULD LIKE TO FIND "MARKET" DEMAND CURVES OF A PRIVATE GOOD, WE MAKE "HORIZONTAL SUMMATION OF ALL BUYERS' DEMAND CURVE."



AT MARKET EQUILIBRIUM, SEE THAT CONSUMERS CAN CONSUME

"DIFFERENT AMOUNTS AT THE SAME PRICE." THIS IS THE CASE OF PRIVATE GOOD.

LET'S TURN TO DEMAND FOR A PURE PUBLIC GOOD...



EFFICIENT PROVISION OF PUBLIC GOOD OCCURS AT

THE LEVEL OF OUTPUT WHERE

$$\sum_{i=1}^n MB_i = MC \quad (\text{HERE AT } Q^* = 45)$$

NUMERICAL EXAMPLES

CONSIDER ADAM (A) & EVE (B)

- $P_A = 100 - \frac{1}{2} Q_A \rightarrow$ ADAM'S
INVERSE DEMAND CURVE
- $P_E = 200 - Q_E \rightarrow$ EVE'S
INVERSE DEMAND CURVE
- $MC = \frac{2}{3} Q \rightarrow$ MARGINAL COST CURVE

IF THE GOOD IS PRIVATE GOOD,
THEN AGGREGATE DEMAND CURVE IS:

$$Q = Q_A + Q_E = Q$$

$$P_A = 100 - \frac{1}{2} Q_A \rightarrow \frac{1}{2} Q_A = (100 - P_A)$$

$$Q_A = 2(100 - P_A)$$

$$\therefore Q_A = 200 - 2P_A \quad \text{--- (1)}$$

$$P_E = 200 - Q_E \rightarrow Q_E = 200 - P_E \quad \text{--- (2)}$$

$$Q = Q_A + Q_E = (200 - 2P_A) + (200 - P_E)$$

IF THE GOOD IS A PRIVATE GOOD, EVERYONE
PAYS/FACES W/ THE SAME P:

$$P = P_A = P_E$$

$$\text{SO } Q = (200 - 2P) + (200 - P)$$

$$Q = 400 - 3P \rightarrow \text{AGGREGATE DEMAND CURVE}$$

$$P = \frac{400 - Q}{3} \text{ OR } = \frac{400}{3} - \frac{Q}{3}$$

IN A COMPETITIVE MKT: $P = MC$

$$\frac{400}{3} - \frac{Q}{3} = \frac{2}{3} Q$$

$$Q^* = \frac{400}{3} \approx 133$$

TO GET P^* , SUBSTITUTE Q^* INTO $P = \frac{400 - Q}{3}$:

$$P^* = \frac{400 - 133}{3} = 89$$

GIVEN $P^* = 89$, ADAM WILL CONSUME:

$$P_A = 100 - \frac{1}{2} Q_A$$

$$Q_A = 22 \text{ UNITS}$$

IF THE GOOD IS A PUBLIC GOOD,
AGGREGATE DEMAND CURVE IS:
BY VERTICAL SUMMATION, WE DO AS
FOLLOWS

$$P = P_A + P_E$$

$$= (100 - \frac{1}{2} Q_A) + (200 - Q_E)$$

W/ PUBLIC GOOD CASE: WE KNOW THAT
 $Q = Q_A = Q_E$. SO

$$P = (100 - \frac{1}{2} Q) + (200 - Q)$$

$$P = 300 - \frac{3}{2} Q$$

AT EFFICIENT PROVISION: $P = MC$

$$300 - \frac{3}{2} Q = \frac{2}{3} Q$$

$$\frac{2}{3} Q + \frac{3}{2} Q = 300$$

$$\frac{4Q + 9Q}{6} = 300$$

$$13Q = 1800$$

$$Q = \frac{1800}{13} = 138.46 \text{ UNITS}$$

$$P_A = \underline{\hspace{2cm}}$$

$$P_E = \underline{\hspace{2cm}}$$

$$Q_A = 22 \text{ UNITS}$$

, EVE WILL CONSUME : $P_E = 200 - Q_E$

$$Q_E = 111 \text{ UNITS}$$

= W/ PRIVATE GOOD, BUYERS CAN CONSUME DIFFERENT Q BUT THE SAME P.

$$Q = Q_A + Q_E$$

(133) (22) (111)

$$P^* = 89$$

HW#2

(1) PLOT

ADAM'S DEMAND CURVE

EVE'S DEMAND CURVE

AGGREGATE DEMAND CURVE

