Lecture III cont.

PUBLIC GOODS

1. Definitions

pure public goods: Goods that are perfectly non-rival in consumption and are non-excludable

non-rival goods: Goods such that on individual's consumption of a good does not affect another individual's opportunity to consume the same good.

non-excludable goods: Goods such the individuals cannot deny each other the opportunity to consume them

impure public goods: Goods that satisfy non-rivalness and/or non-excludability to some extend but not fully

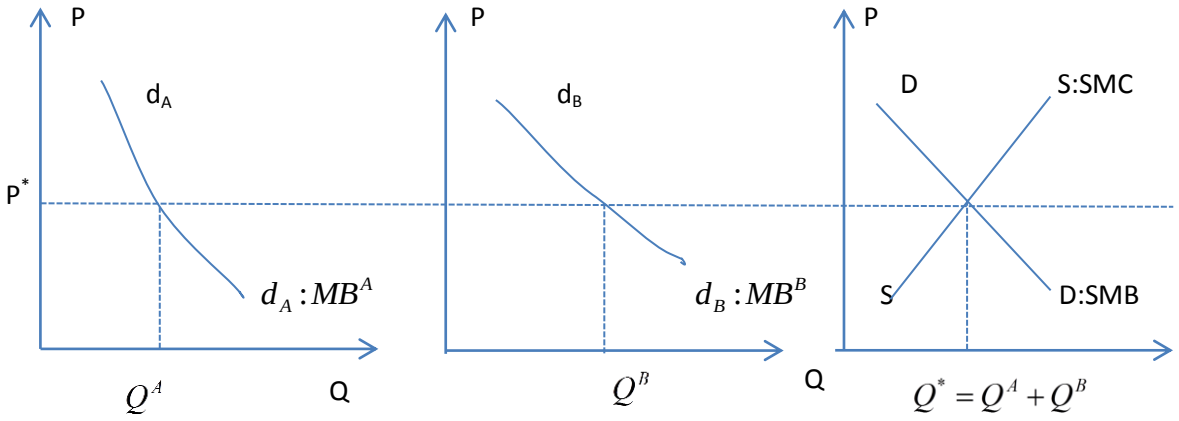
2. Examples

private good: ice cream (i.e., rival and excludable)

pure public good: national defense, lighthouses

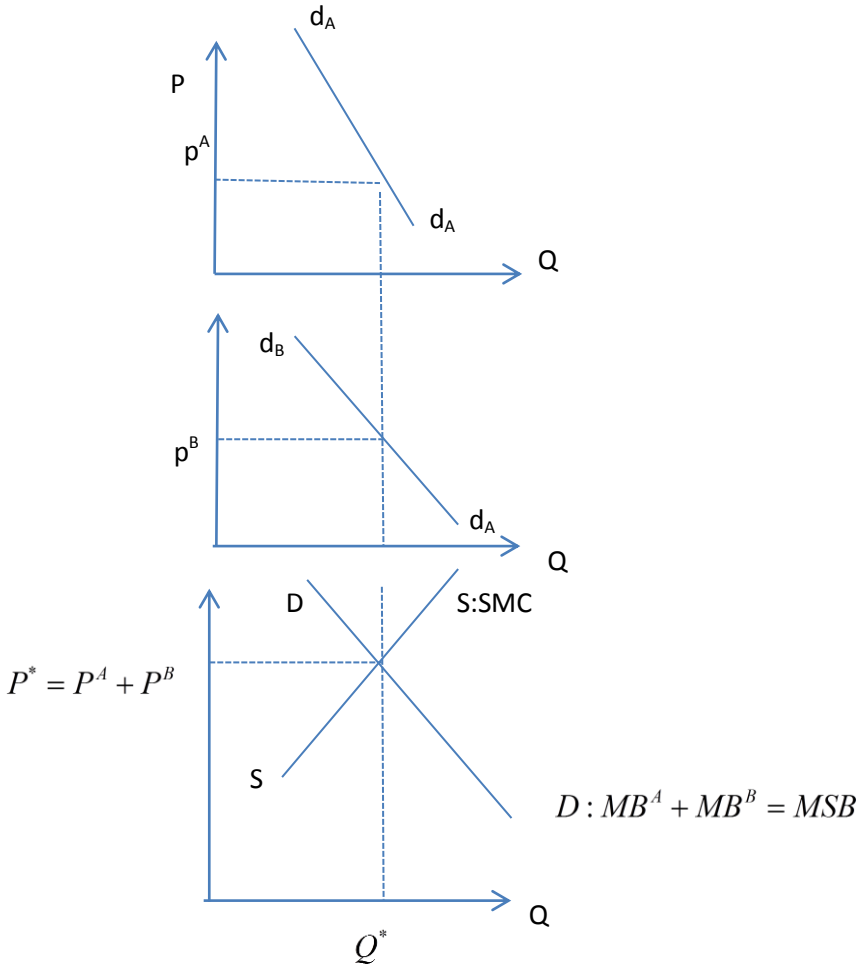
impure public good: congested road (non-excludable but rival)
cable tv (non-rival but excludable)

3. Optimal provision of private goods



$$MB^A = MB^B = SMB = MC = SMC$$

4. Optimal provision of pure public goods



$$MB^A + MB^B = MSC = MC = MSC$$

Necessary conditions for optimality, in general private goods

$$MRS_{xy}^A = \frac{MU_x^A}{MU_y^A} = MRS_{x,y}^B = \frac{MU_x^B}{MU_y^B}\left(= \frac{P_x}{P_y}, \text{optimality in consumption} \right)$$

$$MRTS_{K,L}^x = \frac{MP_L^x}{MU_K^x} = MRTS_{K,L}^y = \frac{MP_L^y}{MU_K^y}\left(= \frac{w}{r}, \text{optimality in consumption} \right)$$

$$MRS_{xy} = MRT_{x,y} = \frac{MC_x}{MC_y}\left(= \frac{P_x}{P_y}, \text{optimality in consumption} \right)$$

Pure public goods (x pure public good, y private good)

$$MRS_{xy}^A + MRS_{x,y}^B = MRT_{x,y}\left(\text{optimality in consumption}\right)$$

Note: If we set $p_y = MB_y = 1$, the above conditions for overall optimality are:

private goods

$$MB_x = MC_x$$

Pure public goods

$$\sum_i MB_x = MC_x$$

5. The free rider problem

Definition: We say that the provision of a good is characterized by the free rider problem if it has a personal cost but a common benefit.

The free rider problem implies that public goods will be underprovided if their provision is left in the private sector.

Examples: R & D

Public Radio

MECHANISM DESIGN: A SOLUTION TO THE FREE RIDER PROBLEM